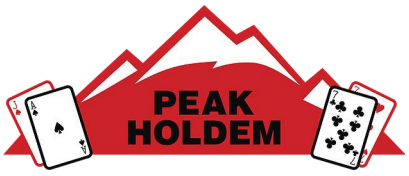
PeakHoldem Users Guide



12/08/2018

Version 2.0

peakholdem.com

FREE

What is the big deal about PeakHoldem free version release 2.0?

It is not what you might think. Sure, bugs have been fixed, the user interface improved, better performance, and lots of new functionality. But, that is not what is important.

The things are really important.

1. We have developed a large database from Hand History files, real games played by real people for money and have used this to construct an Average opponents strategy that is very accurate. Your simulated opponent now plays like a real opponent.

2. We have developed an Optimizer, that develops the best Strategy to beat that Average opponent. We accomplish that pre-flop by playing millions of simulated hands, changing one hand at a time until we have the best possible win rate. The same basic method is used post-flop. Even Game Theory Optimal strategy is adjusted for the best results against your opponent.

3. The free version database includes both the far more accurate opponent strategies and your strategies against that opponent, highly optimized, but not perfect. FREE.

PeakHoldem is not opinion based. It is based on real data and on the results of the simulation.

"Without data, you are just a person with an opinion." The words of W. Edwards Demin.

This is still only the beginning. Every future release will improve the accuracy of your opponent's strategy. Every release will improve your strategy against your opponent.

Even the free version includes the optimizer for basic preflop ranges.

Of all the many benefits of PeakHoldem, being able to implement elements of GTO such as MDF is the most valuable. MDF alone results in dramatic increases in your Win Rate. If you use nothing else, use MDF.

Start with a solid winning strategy and improve from there, step by step.

Some of the ideas used in this product are very unique, and we have applied for a patent, Copyright protection, and Trademark protection.

Serial Number 62/732,519.

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Introduction

What is PeakHoldem

In this users guide you will find two things. Basic instructions on how to use the PeakHoldem application, and an explanation of some of the theory that makes it work. There is a lot more information on PeakHoldem.com. We include just enough here to help you understand what theory behind it is.

Reports are covered in a separate document.

We all want the same thing - **to win more** - but winning is assumed to be hard work. Most of the poker software, coaching websites, and coaches tell you that you must spend hundreds or thousands of hours "developing instinct." The available software, most of it, is very good for this. But few of us have the many hours of study time to dedicate to this pursuit.

Who Can Benefit From This Application

The glib answer would be everyone. But there are actually four audiences that can benefit in different ways. All must be willing to put in a little work.

1. Micro stakes players. If you know the game, but are not yet a winning player, but want to be. You need a solid foundation to improve upon. You require a way to test and verify any changes that you are considering making to your Strategy.

2. Mid stakes player $1/$2 and above. You understand the fundamentals, hold your own, or win a little. Willing to put in a little work to improve your game.

3. Consistent winner. You are good at the game, are a winning player, but are constantly working to improve your game. Your strategy is solid but can use improvement. Maybe just one specific focus such as MDF.

4. Professional level. Consistent winner. Just need another tool to continue analyzing the game. You do not require any basic help but would like to analyze your play and your opponents play more easily. Making a change to what is already a solid strategy can be expensive, both in time and money. You need to be able to make a Strategy change and validate it quickly.

There is an easier way. Start with a solid strategy and improve from there.

How is it that we can claim that is a solid strategy

1. We started with a high-speed simulator that simulates the play of an entire game, 6-Max No Limit Hold'em. Not special cases, a full game. All play decisions are in an external database. No play decisions are ever made by the simulator.

2. We developed a large database from real Hand History files. This database was used to create an

accurate strategy for the Average opponent. All of the frequencies for his actions, fold, call, bet, raise, all-in. Based entirely on data. No opinion. We can now simulate play against an increasingly accurate opponent.

3. We developed an Optimizer for the Hero's play against the average player. It simply makes a small change to the Hero's strategy, runs 1,000,000 hands with that change and evaluates the resulting change in the win rate. If the win rate improves it keeps that change. It repeats that process until no further improvement can be made.

4. We closed the loop by creating Hand History files for the simulated Hands. We used Holdem Manager to analyze the play of both the simulated average opponent and the simulated Hero.

That is what we call a solid base. Not perfect, that depends on the completeness and accuracy of the opponent's strategy. Every future release will include an increasingly accurate Average opponent.

How to start with this Solid Base

1. Preflop, the strategy is in the standard ranges that you are probably already familiar with. The standard 13 X 13 matrix of all possible two card hands. These charts can be displayed, printed, or edited. There are a lot of starting range charts around but ours can be edited and run as a new strategy against the Average opponent. Rerun the simulator for hundreds of thousands of hands in seconds and see the result. Improve your own strategy.

2. There are currently 144 different preflop ranges. The basics like open or call for each position but also advanced ranges for plays like Squeeze, Isolate, Min-Bet, and many more. Too big a chunk for one byte. Start with open, call, and three-bet. Don't try to memorize the ranges. Instead, learn a single chart that shows hands for various frequencies, keep the chart handy and just memorize one number for each range. A little work, but not that bad. Do it in steps. There is no need to do everything at one time. Start with Ranges that have the most effect on your Win Rate.

3. Post-flop ids also based on range tables. Something as complicated as Game Theory Optimal GTO Minimum Defense Frequencies MDF. Or something as simple as a continuation bet. The post-flop ranges are a subset of the preflop ranges. Random to avoid being exploited but still have a precise frequency. An example would be a C-Bet range. We start with the opening hand that you used pre-flop. To C-bet 70% of the time, use a range that is 70% of the preflop range, then C-Bet based on that reduced range. A little more complicated than that, but we will get in depth in later sections.

4. There are also Rules files for post-flop play. Guidelines for when to fold, call or raise based on what you flop. Combined with ranges like C-Bet and MDF.

What else will this application do

We absolutely believe that making decisions without data if foolish. Certainly not in wagering real money based only on opinion. Simulation has been used for years to supply accurate information, like the all-in equity of starting hands. Remember PokerStove? We have taken to new levels not available before. We can do this because PeakHoldem simulates a full game, not special and limited conditions. What PeakHoldem will do for you:

1. The most basic statistic is your win rate. It's what the game is all about. Make a change to your strategy, play 100,000 simulated hands in a couple of seconds, see your new win rate change. Other basic statistics like VPIP and MDF.

2. There are a set of reports for the results of a flop. How often will you have Top Pair or a Gutshot draw? All of these numbers depend on your preflop ranges as well as probability. Real data, not opinion.

3. Unique to PeakHoldem, the expected value of every hole card hand. If you opened preflop, with AA and knew it's equity value then, what is it's Expected Value now? Definitely not the same.

4. If Hole Cards have Expected Value then the hand that you made on the flop must have Expected Value. No other software gives you these statistics. More real data.

5. Flop textures, Wet, Dry, and Neutral are analyzed. What percentage of the time do you flop draw on a Wet board. Very useful to know. Unique to PeakHoldem.

6. Then there are Hand History files produced by the simulation. The standard format that can be analyzed by multiple applications. We like Holdem Manager. Make a change to your strategy, run a few thousand hands, then analyze your results with a tool that you are already probably familiar with.

How you can develop your own strategies

Developing your own strategy is the whole idea. Where you play, website or live, and what level you play at are what determine your opponent's frequencies. Your personality will determine, to some extent, your style of play. There is no universal solution:

1. All Ranges in the database have specialized editors. You can edit individual cards in a Range, or change an entire range just by specifying a percentage.

2. All Rules can be edited.

3. The play configuration can be edited. You choose what player type will be in each seat. All player types, except Average, can be edited. AverageX is installed as an exact copy of Average and can be edited.

Future releases

As you certainly expected, there will soon be a paid version with even more functionality. Every release of both the free version and the paid version will have improved opponent strategies based on real data, not opinion.

The free version and the paid version are actually the same code. The paid version just has the additional functionality enabled. In fact, much of the paid version is already here, just not enabled.

We are not foolish enough to talk about all of the planned functionality or improvements. But there is much, much more either in the coding phase or in the development phase. User feedback will guide us there. Do not hesitate to request changes or enhancements.

Game Theory Optimal GTO and Minimum Defense Frequency MDF are already included and much more will be added. The current implementation and all future implementations will be practical, not just theory. GTO is based on not being exploitable. That means that GTO play does not exploit to the maximum extent. The exploitative play is almost always more profitable. No reason to ignore the technology, we just use to be maximally exploitative. Translation: We want to win as much as possible from humans, not play against GTO or AI computers. In fact, our implementation of MDF can dramatically improve your win rate with minimum effort.

Download

Downloading the PeakHoldem application is done through the peakholdem.com website. Select the download tab and the version that you want. PeakHoldem runs only under Windows. It is written in Java and may in the future be ported to other platforms.

The download is standard.

1. When you select the download button an installer is downloaded to your computer. It's a large file because it includes the database. After the download simply clicks on the Installer.
2. If you get this message:

"Windows Defender prevented an unrecognized app from starting. Running this app might put your computer at risk."

- Click "More Info." Then click "Run anyway."

Quick Start

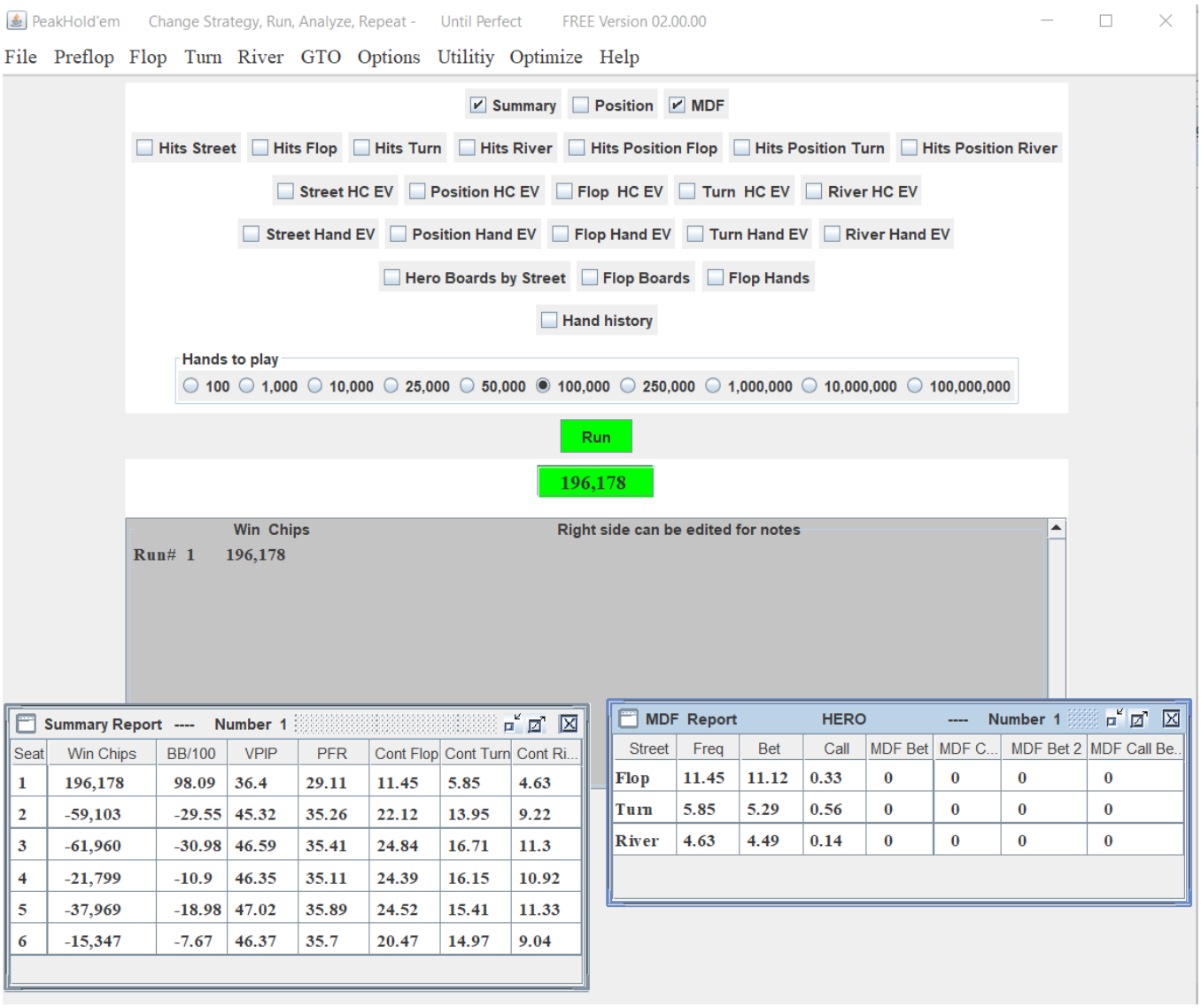
How to begin using this application

1. Select “Run” just with the default database. Select some reports that look interesting.
1. Run 100,000 hands and look at the win rate and the reports.
2. Run a few thousand hands with the Hand History option enabled, then import them into Holdem Manager or Poker Tracker or a hand Re-player (whatever is your favorite). Evaluate for yourself. Evaluate the results as you would if you had played the hands online.
3. Use PeakHoldem to change the preflop range(s). For quick results use “Preflop” and “Automatically Generate Preflop Ranges. Select “Hero”, Button” and “Open”.

All of the preflop ranges are shown as percentages and the Button Open range is ready to be changes. Change the range by 10% up or down. Click “OK”. Click “Run”.

4. Look at your Win Rate and reports again.
5. Select “Options”, “Select Players for each position”, then select “Use MDF”.
6. You know the drill now. Run again and look at results.
7. Have fun. Win a little more money. **Maybe win a lot!**

Please note that graphics were created prior to the actual release. Values may or may not be entirely accurate. Consider them only to be a close representation.


PeakHold'em
Change Strategy, Run, Analyze, Repeat -
Until Perfect
FREE Version 02.00.00
File Preflop Flop Turn River GTO Options Utilitiy Optimize Help
Summary
Position
MDF
Hits Street
Hits Flop
Hits Turn
Hits River
Hits Position Flop
Hits Position Turn
Hits Position River
Street HC EV
Position HC EV
Flop HC EV
Turn HC EV
River HC EV
Street Hand EV
Position Hand EV
Flop Hand EV
Turn Hand EV
River Hand EV
Hero Boards by Street
Flop Boards
Flop Hands
Hand history
Hands to play
100
1,000
10,000
25,000
50,000
100,000
250,000
1,000,000
10,000,000
100,000,000
Run
196,178
Win Chips
Right side can be edited for notes
Run# 1 196,178
Summary Report ---- Number 1
Seat
Win Chips
BB/100
VPIP
PFR
Cont Flop
Cont Turn
Cont Ri...
1 196,178 98.09 36.4 29.11 11.45 5.85 4.63
2 -59,103 -29.55 45.32 35.26 22.12 13.95 9.22
3 -61,960 -30.98 46.59 35.41 24.84 16.71 11.3
4 -21,799 -10.9 46.35 35.11 24.39 16.15 10.92
5 -37,969 -18.98 47.02 35.89 24.52 15.41 11.33
6 -15,347 -7.67 46.37 35.7 20.47 14.97 9.04
MDF Report HERO ---- Number 1
Street
Freq
Bet
Call
MDF Bet
MDF C...
MDF Bet 2
MDF Call Be..
Flop 11.45 11.12 0.33 0 0 0 0
Turn 5.85 5.29 0.56 0 0 0 0
River 4.63 4.49 0.14 0 0 0 0

A Little Theory

The Simulation Engine

We just ran hundreds of thousands of simulated hands and calculated how much was won or lost in each game. We also looked at a couple of basic reports made some Strategy changes and saw the difference in results.

There are four basic parts of our design:

- The Engine that plays Hold'em but makes absolutely NO play decisions, such as Fold, Check, Call, Bet, or All-in. **The prime directive is absolutely no decisions play made by the Engine!** The Engine is very fast and will play a million hands in a few seconds. It generates Hand History files just like a poker Website. You can PeakHoldem with existing poker programs like Holdem Manager (Highly Recommended), Poker Tracker, or a Re-player.
- A database that controls all play decisions. These files are Ranges, Rules, Values, and Options. There are programs that edit ALL of the database files.
- Editors for every Strategy file. Make a change then see results in seconds.
- Reports about what happened. Results are from simulation but are very accurate.

If you selected the MDF option you saw a huge change in win rate. We did pick the most dramatic improvement, but there is much more.

Reports alone are worth the price. Well, it is free after all.

For example, you can select “Street HC EV”, 100,000 hands, and Run, it reports the EV of Preflop hole cards on the Flop, Turn, and River, and Overall. The EV is based on how both you and your opponents play. You can try to improve this EV value by changing your Strategy or simply use it to make decisions. No other software estimates the EV of preflop starting hands. The numbers are not mathematically precise, it's the relationship of hands that is important, not the precise number.

You can look at “Hits Street” to see how often a hand or draw are made. “Street Hand EV” will give you the approximate EV of hand types, made hands and draws, on every street.

To do more detailed analysis, select Hand History, 10,000 hands to play, and Run. Now import your Hand Histories into Holdem Manager. It is a fantastic tool for analyzing your play. This a Hold'em analysis tool that has around for years and is trusted.

Check out LeakBuster for a quick and simple analysis. If you don't already own it, they have a 30-day free trial. The Leak Buster add-on is very good at improving your game. Take one of their suggestions and go back to PeakHoldem and try to improve your game.

Stop when you are winning enough.

Database

Most serious Hold'em players understand that the modern game has become more and more about frequencies. Not many really understand that a range is a frequency and that a frequency can be a range, or a percentage.

Much of what the database accomplishes is to encode frequency as a standard 13 x 13 matrix of the 169 possible starting hands. An opening range is just a frequency.

We all know about ranges preflop. If you check your range with Flopzilla, you will see a percentage. At the bottom of the range, the matrix is both a percentage number and a combos number. There are 1326 combinations of 2 cards. The median is 663 combos. A 10% range would be 1362 combos. With 132 you will bet or call 10% of your hands.

If you use Holdem Manager, you will see VPIP Voluntarily Put In Pot, and PFR Pre-Flop Raise as percentages. In fact, almost everything in their report is in percentages. If it is a percentage, then it can probably be represented as a range. Every percentage has an optimum range. An overall VPIP of 20% is good, a VPIP of 40 is a Fish, and a VPIP of 5 is a NIT.

Let's see how a percentage or frequency can be implemented. If you want to bluff on the Flop 50% of the time time, you can use the color of the first card first that is dealt black bluff, red no bluff. This will get you to the frequency that you want but is not a good way to do it. It means that there is no logic to your bluffs, no consideration of the value of the cards that you hold. A bluff range can include the best cards that you will not open with. Don't bluff with 72o. Bluff with hands that have a better chance of winning but were not good enough to bet for value.

A much better way is to use your preflop ranges as a basis for post-flop ranges. Suppose that you open for 35% of your hands on the Button. To establish a C-Bet frequency (Range) of 70%. Simply create a range of the best 70% of your open range. Every time that you get to the Flop, and you opened preflop, use your new C-Bet range and C-bet when your Flop hole cards are in that range. Accurate meets the requirement of randomness to prevent exploitation and uses your best 70% of your best preflop hands as the basis. It's a little more complicated than that because you also have to take into account made hands and strong draws. We will get into that later.

None of this would work unless your opponent's Strategy was accurate. Using a huge database of real hands, constructed from real Hand History files, we have created a Strategy for the Average opponent that is very accurate, Based on real data, not opinion. Simulation of play is therefore far more accurate. We use Average because most of the time when you sit down at a table in a Casino or an internet site you do have accurate information on your opponents. The average is the best starting point.

The Simulation is done using Average (or other player types) against Hero (that is you). All default Hero ranges have been created through Optimization. We do this by automatically playing hundreds of thousands of hands against Average opponents. Then we make a small change to Hero's Strategy, run

again and look for a change in Win Rate. We repeat this until no further improvement is possible. The free version is close but not perfect.

Garbage in, garbage out. Real data in, accurate results. Not based on opinion, data-based.
Every future release will include improvements to opponent Strategies, more and more accurate.

Simulation

The current PeakHoldem simulator is briefly described here. Many improvements are either in the coding stage or in the planning stage. For obvious reasons, we will not discuss future changes here.

The current Simulator consists of:

1. A dealer. This is a program that simulates what a real dealer does. Deal cards, enforce rules, handle money, handle conditions such as All-in, split pots, and side pots.
2. Evaluator. This program would determine the winning hand. It would also determine made hands and draws on each street for every player. It would evaluate boards and assign a numeric value to the boards.
3. Players. This program would simulate all player actions using a Database. It would never make decisions to fold, check, call, or bet. It would only use files in the database for that. Ranges, Rules, and options.
4. Database. A collection of files that control all player decisions. For example, the ranges that all players are familiar with preflop such as open, call, bet 3, call bet3. Bet4, call bet4, all-in for every position. It would include ranges for things like MDF on every street. Rules that determine what hands a player will fold, check, call, bet, or all-in. Options for things like stakes, bet sizes, etc..
5. Editors. Specialized programs that allow for editing of all files in the Database.
6. Reports. After the simulation of a large number of games, many reports would be generated. Reports for hole card EV and hand EV on every street. Things like that.
7. Utilities. Many are possible. For example, one to optimize the Database files for the best win rate including things like MDF ranges.
8. Hand Histories. No one will trust a simulator unless it produces Hand History files that can be analyzed by applications such as Holdem Manager or Poker Tracker.
9. Software that analyzes real Hand History files and creates opponent strategies that accurately describe how your average opponent plays. This is now very accurate and is being improved to be much more comprehensive.
10. An Optimizer for Hero play. It runs hundreds of thousands of simulated hands, makes small changes, then runs again. It repeats until no more improvement\

Simulation vs. other technologies

In the last few years, knowledge of how to improve your Hold'em has improved dramatically. Applications like Holdem Manager have given us a lot more information. Game Theory Optimal has provided new insights. AI is now a reality and a base for information.

Full game simulation is our contribution.

One is not better than the other, they are just different and each has its place. Simulation has been very underutilized. If you want to play against a computer that makes no mistakes allowing it to be exploited, the best that you can do is break even. If instead, you play against other humans, that make many mistakes, then Exploitation is the best Strategy. What you exploit are their mistakes.

There is also the question of performance. Computers using GTO have been playing against themselves for years. But, no limit Hold'em remains unsolved. When it is, it will be perfect against the perfect opponent. I hope never to play against him or it. AI has the same problem. It learns, can learn against human opponents, but is unable to simply explain what it has learned. Nope, I will never want to play against an AI. Humans are so much easier.

Another more promising technology is by simulation. The simulated opponents MUST accurately represent the play of humans. We have analyzed over a million hand history files from real games to develop an opponent strategy. That is who we play against. We never plan to beat a GTO or AI computer. Not remotely worth the effort. We just exploit human mistakes.

We have implemented all played decisions as files in a database. All elements of the strategy can be edited, 100,000 simulated hands played in seconds, and the win rate determined. Change your strategy against accurately simulated opponents and see the results. Repeat until perfect.

Admittedly, simulation cannot produce 100% accurate numbers, but it can come very close. Close is good enough to defeat 99% of your opponents. You don't develop a strategy against some computer, you develop and test your Strategy against accurately simulated human opponents.

Sometimes close is good enough when the only other option is to wait and hope that AI produces something usefully for a full game soon. For example, the application can closely approximate the Expected Value of Flop made hands and draws. For example, the EV of an OESD with a pair is 3.5 and a flush draw is 2.5. It's the relationship that is important not the precise value. We are spending a lot of time now, trying to improve the precision.

There is an old joke. Two men are running from a bear. Man 1 “We will never be able to outrun that bear” Man 2 “I don't have to outrun the bear, I only have to outrun you”.

You don't have to outrun GTO or AI. You only have to outrun human opponents. Learn to exploit their mistakes. Most mistakes are incorrect frequencies. Opponents who bluff too much or don't bluff enough. Opponents that play too many hands, or too few hands. Opponents that raise too much, or don't raise enough. All can be exploited.

Using the Simulator to improve your game

The principles are simple. Against an accurate opponent strategy, change Hero's strategy to improve your win rate. If win rates improve, it's a good change.

A range is a more sophisticated way of implementing a frequency, the real basis for Hold'em. A Range is more sophisticated because it includes relative value and randomness.

A Range file is a 13 x 13 matrix. The matrix represents the 169 possible hole card combinations. The number of combinations is actually 1326, but by classifying as pairs, suited, and unsuited the number is simplified without losing accuracy.

A Range can be changed in basically three ways.

1. By adding or removing specific hands.
2. By automatically Generating a Range based on a frequency value (percentage).
3. By automatically optimizing the range.

Ranges and Frequencies

A Range and a frequency are essentially the same thing. A frequency is how often you or your opponent does something, such as open preflop in a specific position. A Range is that frequency, but the hands in a range are added in value order such that a 10% range has the best (largest EV) 10% of two card hands.

Modern Poker is all about Frequencies and Ranges. Most professionals agree with this. There are things like Exploitation that can be expressed as Ranges.

Editing a Range

This is how a range is displayed and edited. Pairs are diagonal in the middle. Suited hands start after a pair and continue left. Offsuit hands start on the Left and continue to a pair. This specific range is preflop Open for the Cutoff position.

All 169 possible hands are represented. The colored hands are the ones that Hero will open with. There are Ranges for every player type, preflop action, and position. All but Average can be edited. AverageX is a duplicate of Average and can be edited.

To remove a hand simply click on it. To add a hand click on that. Click Save when you are satisfied with the editing.

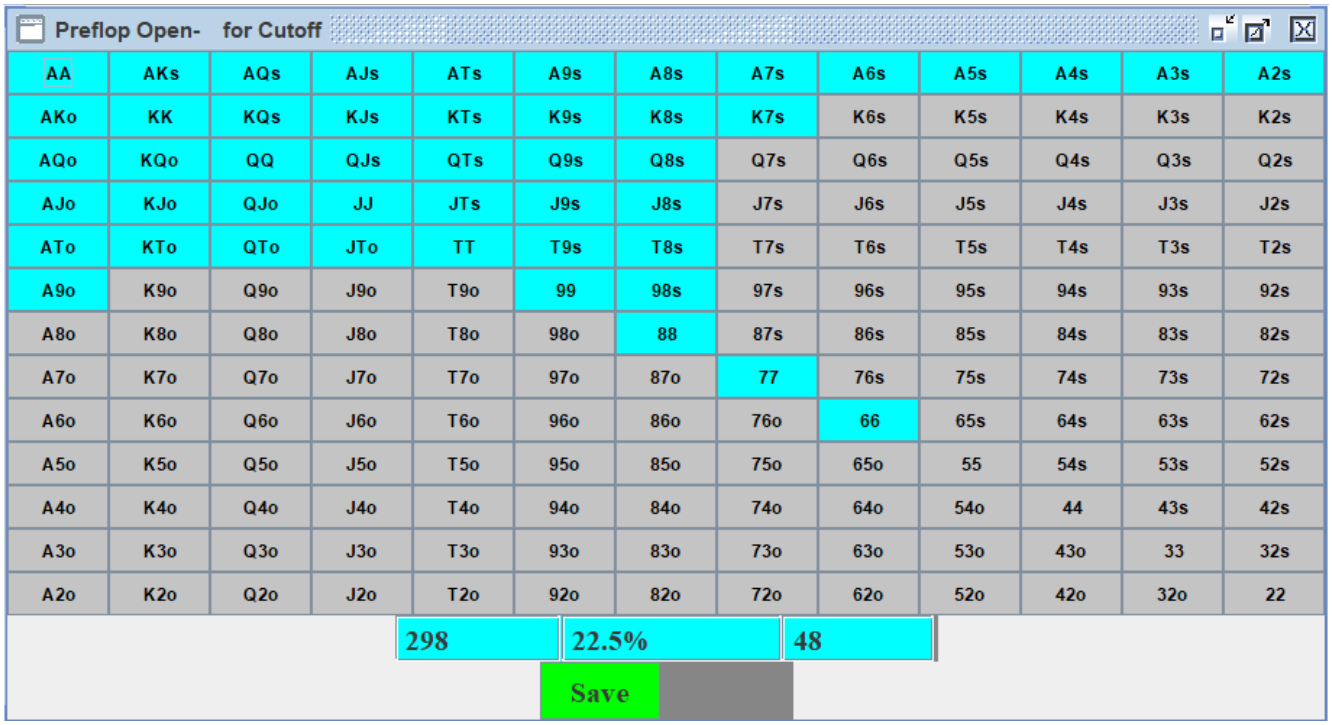
The numbers at the bottom of the display are:

1. The number of combinations selected. Pairs have 6 combinations. Offsuit have 12 combinations, and suited hands have 4 combinations.
2. The percentage or frequency is the percentage if the 1326 possible 2 card combinations.
3. The count is the number of hand types selected.

22.5% means that over a period of time that that will be the open frequency.

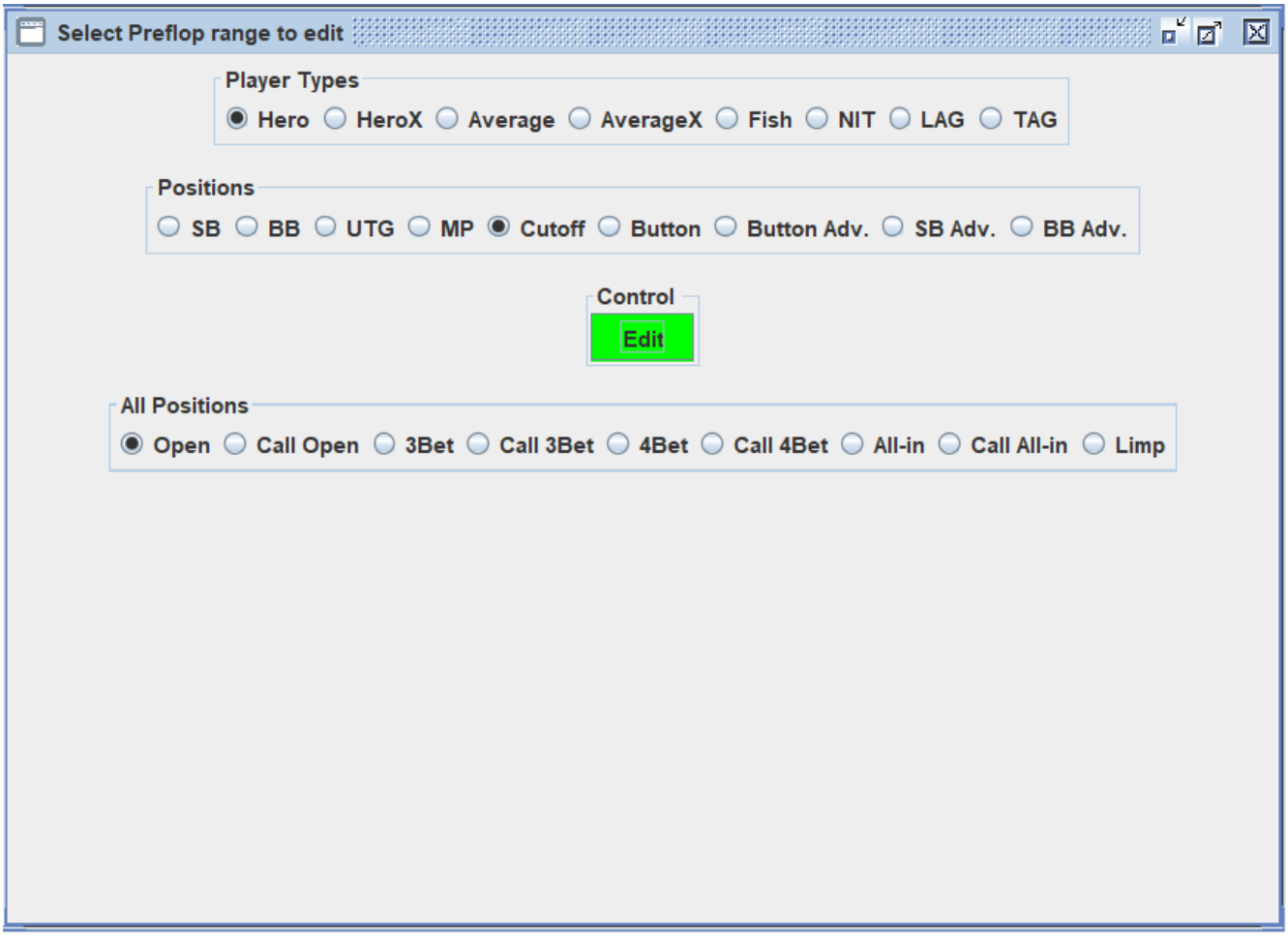
Matrix

Please note that graphics were created prior to the actual release. Values may or may not be entirely accurate. Consider them only to be a close representation.



Menu

The menu bar, Preflop, Edit Range
Hero, Cutoff, Open



A lot of other more advanced ranges can be edited. Select Button Adv, SB Adv, or BB Adv to see or edit the advanced ranges.

To evaluate a change in the Range table, add or remove a few hands. First, run 100.000 hands with the default ranges and notice the win rate. Then make a change, like removing AA KK and QQ. Run again. The win rate will be lower. Add them back into the range and run again. The win rate will go back to what it was. Now add a couple of new hands.

Automatically Generating a range

Creating a new Range

The automatic generation of ranges is simply a faster way to change an entire hand. You select the range that you want to change and a percentage number. The percentage is of the possible combinations of all two-card combinations, 1326. A 50% Open Range number results in a Range that will have you, the simulator Hero, opening exactly 50% of the time.

We have developed Playability tables that order the card combinations from the strongest to the weakest two card hands. If you generate a 10% Range, the 10% of hands with the best Playability make up the range. This results in the strongest range for a given percentage.

In order to help you visualize a Strategy, collection of Ranges, all of the preflop ranges for a player type are displayed. In the graphic, the Hero, Cutoff, and Open are selected. The ranges displayed at the bottom of the screen so that you can quickly see all Ranges and their relationship. No range stands entirely alone. An Open Range and a Call bet Range are a pair. A change in one implies a change to the other. All preflop ranges have an effect on the others. Of course, for a small change, you can safely ignore the other Ranges.

You can see that Ranges are made up of some percentage of all possible two card hands, that the cards in the Range have the best Playability, and that all ranges are related, and together form a strategy. Another slight oversimplification, but sufficient for now.

Back to using this tool. Make a change to a Range. Example reduce Call Bet by a small percentage, run 100,000 hands or more and see the win rate change.

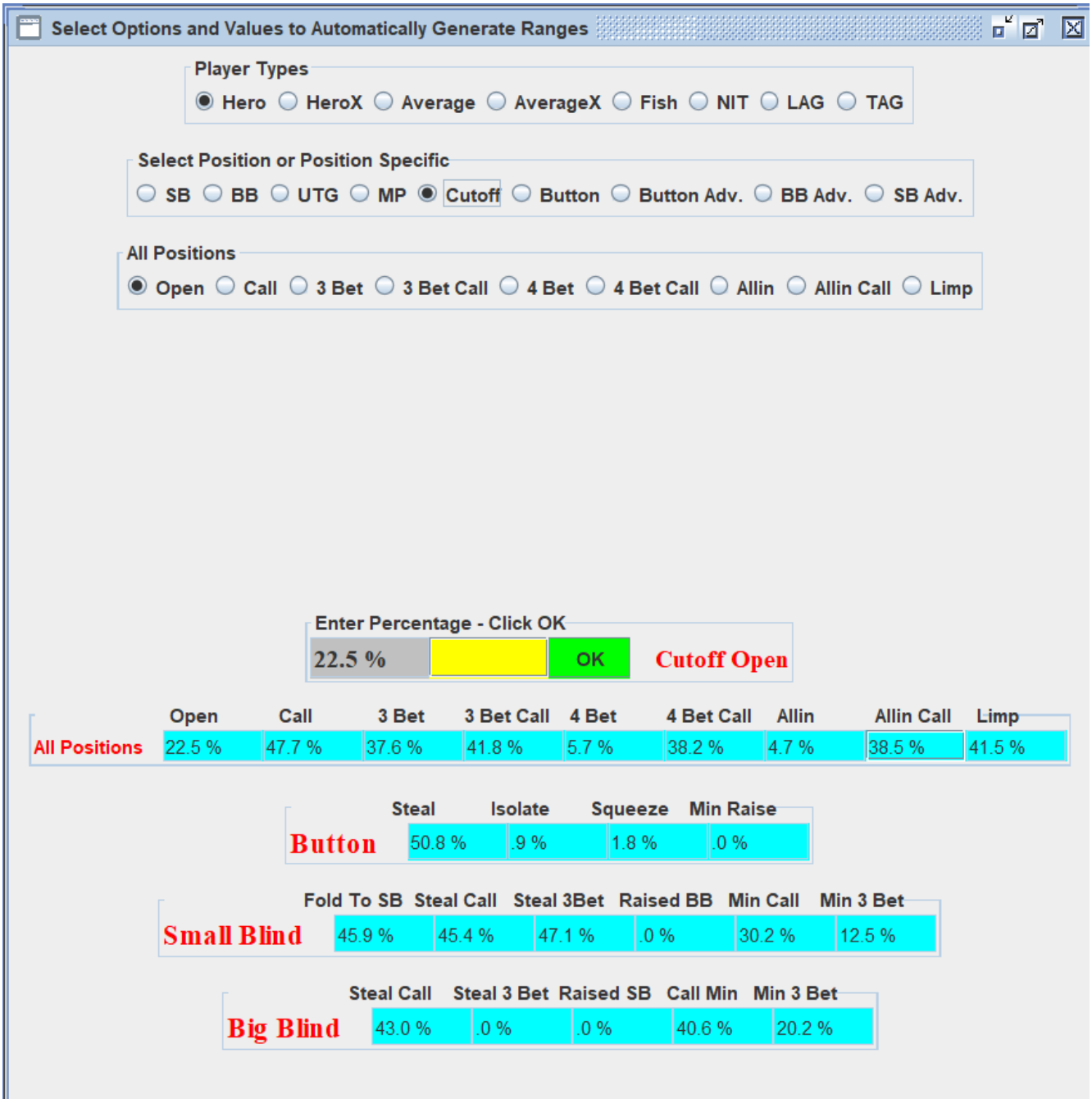
There is more help available in the form of Hand History files and many different reports that can be selected.

Menu

Note: Numbers in the graphic were from before the final Release 2.0 and may not match the released version.

The menu bar, Preflop, Edit Range

Hero, Cutoff, Open



Optimizing a Range

Basics

Automatic optimization is partially supported in the free version and fully supported in the paid version. All Hero default Ranges were created using the Optimizer, but only to the point of a solid Strategy. But what you get for free is still a solid starting point and can be the basis of a winning Strategy.

Preflop ranges are fully Optimized but only for Hero.

It is very important to understand that Optimization depends on literally everything in your Strategy and in your Opponents Strategy. It's the beauty of full game simulation. By playing a full game with a full table and all of the player interactions, the result is far most comprehensive than mathematics alone can be, at least with current technology. Every move, every street, every position, every Range, All Rules, they are all part of the full game simulation.

Some believe that the same thing can be accomplished through GTO Solvers, or through AI. Not yet. Solvers are limited to simplified situations, like Heads Up. AI is unable to explain to a human what it has learned. Simulation works now and handles Exploitation Play.

Optimization is performed by making small changes to one Strategy Range, running hundreds of thousands of hands with that change and looking at the new win rate. Results that result in an improved win rate are kept and a lower win rate discarded. This continues, for each range, until the best results are achieved. Then the next Range is done.

This process can take several minutes to run. Take a break, have a cup, you deserve it for making it this far.

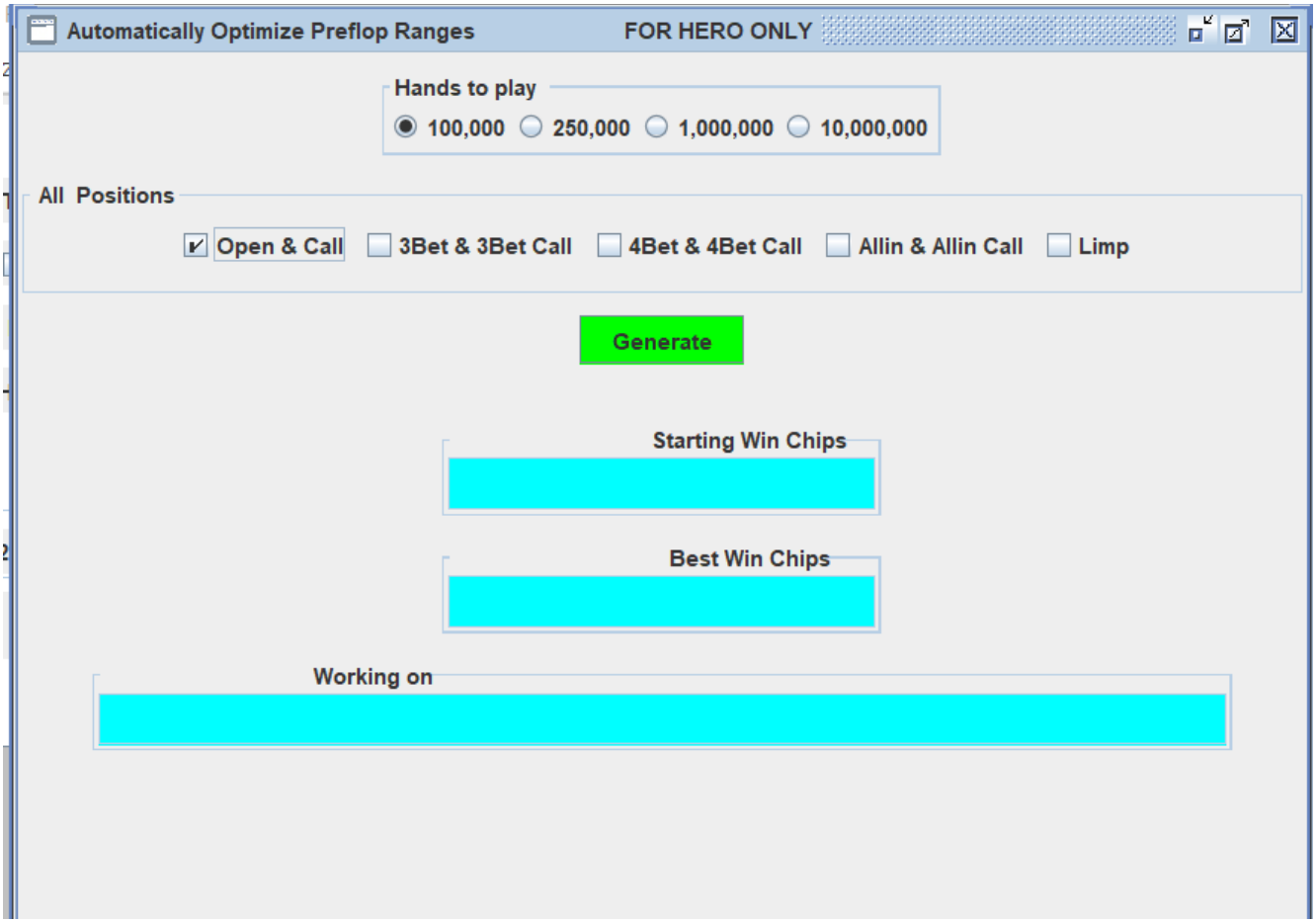
You can tell when the Optimizer is finished simply by looking at the “Generate” button. If it is pale green, then the Optimizer is still running.

Screen Shot

Note: Numbers in the graphic were from before the final Release 2.0 and may not match the released version.

The menu bar, Preflop, Edit Range

Hero, Cutoff, Open



Opponent Strategies

The default Strategies for the Average player cannot be changed, only displayed. But, the AverageX strategy, as installed, is an exact copy of Average and can be edited. If you want to change the Average strategy, switch your opponents to AverageX, then modify AverageX.

If you have a Hero strategy that you have modified and are happy with, use the menu bar File, Copy Hero to Herox to save the changes. Also a good idea to backup frequently. Now continue experimenting with Hero. If you mess up, copy HeroX back to Hero. Even change the opponent lineup to have Hero play against HeroX.

There are several other opponent types, Fish, NIT, LAG, and TAG. They do not yet have Strategies based on real data. They are there for you to experiment with.

Depending on your level of experience, you may feel that Average does not exactly represent the opponents that you play against. Great. Switch to AverageX and modify strategy until you are satisfied that you have a more accurate representation of your opponents. Play against Hero and see if they really are better. Again, using the win rate.

You can then use any of the modification techniques previously described, or the ones to be described in later sections, to develop a more effective Strategy against your particular opponents.

If you have a lot of opponents of particular styles then put one or more into the game. Modify their strategies to match that opponent type. Then develop a unique strategy against them. See what works to counter an opponent that is far too tight or far too loose. Whatever characteristics that you are interested in. Test your current strategy against them. Modify your Strategy to exploit their mistakes.

Preflop Ranges

Basic Preflop Ranges

There are 9 preflop ranges for each position. Sounds like an awful lot to have to memorize. It's much less difficult if you memorize the one basic Range, then think of all other Ranges only in terms of how they differ.

For the preflop ranges, the position is vitally important. It gives you a couple of key advantages. If you act after another player you know where he stands. If he folded, he is out. If he called (limped) then you can generally assume that he did not have a hand worth opening. Limping is almost always a bad idea. You have the additional advantage of having position over him on every street.

Your actual Open Range gets wider after the player in each position has acted. The Button has a huge advantage, being last to act on every street. The Button will have a Range about double the UTG Range.

There is a whole lot of theory about exactly how to choose a Range. Just about every coaching website and most books include free Range Charts. People have wasted hundreds of hours trying to define a specific Range for a Specific position. Generally a waste of time. Once you understand that a Range is just a way of defining a precise frequency then you can relax a bit.

In any Range, there is an order of the hand value ranking. Some use all in equity, some use Playability. It's just generally opinion based what sequence hands are added to a Range. Don't worry about that. If you want w 26.5 % range, it will be generated for you.

If you just start with our optimized default ranges you are in good shape.

Open - 2 Bet.

The Open Range (2 Bet Range) is for when all of the players ahead of you have either limped or folded. A limp is actually a 1 Bet, the amount of the Big Blind forced bet. It is usually your first key decision. The Open range defines when you will either Fold or Raise to a second bet. The raise is usually 3 times the Big Blind, or 6 chips. We use chips here because they are independent of the dollar amount. We will explain later that your primary concern Opening id if there will be a 3 Bet.

3 Bet

This Range is checked first before the 2 Bet Call Range is checked. The hands in this range are the ones that you will 3 Bet with.

Call - 2 Bet Call

When a player Opens (2 Bet) then the decision is whether or not to call or raise to a 3 Bet. The 3 Bet Range is checked first, then the Call 2 Bet Range is checked. When editing a Range, it is a good idea to keep the sequence of Range checking in mind. These are the cards that you will call a 2 Bet with if there is no 3 Bet.

3 Bet Call

When a player Opens 3 bets ahead of you, then the decision is whether or not to call or raise to a 4 Bet. The 4 Bet Range is checked first, then the Call 3 Bet Range is checked. When editing a Range, it is a good idea to keep the sequence of Range checking in mind. These are the cards that you will call a 2 Bet with if there is no 3 Bet.

4 Bet Call

This Range is checked first before the 3 Bet Call Range is checked. The hands in this range are the ones that you will 4 Bet with. An opponent must have made a 4 Bet.

All-in

This Range is the Range with you are willing to go All-in. Usually a very small Range. Because an All-in bet can be made anytime, this Range is checked after a 2 Bet and before checking 4 Bet.

All-in Call

When an opponent bets All-in, this Range is checked to see if there will be a Call All-in.

Limp

Limping and a 1 Bet call are the same thing. The 1 Bet is a forced bet made by the Big Blind. Calling that bet is called a Limp. Limping is usually a bad idea except in a couple of circumstances.

“Limp” should be larger than your “Open” range if you wish to limp. We recommend 0 %.

Advanced Preflop Ranges

Button

These Ranges are unique to the Button only. Clicking “Button Adv.” activates another row of buttons unique to the Button.

Steal

When app players have folded to the Button, a “Steal” can be attempted. The Button raises with a wider range of hands than his “Open” range, hoping that the Small Blind and the Big Blind will fold.

Even if one Blind calls, they will be out of position the entire game. This range must be wider than the “Open” range if used.

Isolate

By pushing the rest of the table out of a hand, you will have a better chance of winning the pot by making the best hand by showdown or be able to use position to take down the pot after the flop.

Since Limpers are usually just trying to see a cheap flop with marginal hands, you can raise in position even if you don’t have a premium hand. Most of the time the Limper will just fold but when they do call it’s usually a mistake. And since limping too much is generally a sign of a weak player, you should be trying to play as many pots against them as possible, especially when you're in position. So next time you identify a player as limping too much, consider raising. Hopefully, the rest of the table will fold and you'll either win the pot Preflop or go heads-up in position against a weak player, which is always a recipe for profit. Isolating specific players Preflop is a great strategy because it focuses your game. In Hold'em, the idea is to play against the worst players as often as possible. If you can create situations in which you're playing only against bad players, your profits will increase. In essence, this is exactly what isolating Preflop does – it ensures that you'll be playing a pot against a player on whom you've got some sort of advantage. The more pots you play against poor players, the more money you win.

Min-Bet

When you min-raise, a player may mistake your raise as deception and think you might be appropriate. It can create confusion for your opponent. Min-Raising raising with a premium hand. Mat cause opponents to slow down and thus may result in you getting to see a cheaper flop.

Squeeze

Small Blind

These Ranges are unique to the Small Blind clicking "Small Blind ADV." activates another row of buttons unique to the Button.

Folded to SB

This is the case where all players have folded to the Small Blind. This is an opportunity to steal the pot from the Big Blind by raising with a weaker than usual hand. The "Folded To" range must be wider than the Open Range.

Steal Call

This is the case where all players folded to the Button and the Button raises. It's possible that the Button has raised with a weaker hand than his normal Open range in an attempt to steal the pot. The Small Blind should call with a wider range.

Steal 3 Bet

This is the case where the Button has 3-Bet with one raiser.

3 Bet Min-Raise

If there is a 3-Bet that is smaller than usual. If there is a Min-Raise (2 BB) an opponent may be trying to see the flop cheaply and this may indicate a weak hand. The Small Blind should probably call or raise with a wider range.

Raised by Big Blind

This is the case where it was folded to the Small Blind and the Small Blind raised or called. The Big Blind may raise with a wider range in order to steal the pot from the Small Blind. The Small blind

may call with a wider range.

Big Blind

These Ranges are unique to the Small Blind clicking "Small Blind ADV." activates another row of buttons unique to the Button.

Call Steal

This is the case where all players folded to the Button and the Button raises. The Small Blind did not raise. The Big Blind should probably raise or call with a wider range.

3 Bet Steal

This is the case where the Button has raised after all other opponents have Folded or Limped.

Min-Raise Call

This is the case where all players folded to the Button and the Button raises. It's possible that the Button has raised with a weaker hand than his normal Open range in an attempt to steal the pot. The Big Blind should call with a wider range.

3 Bet Min Raise

If there is a 3-Bet that is smaller than usual. If there is a Min-Raise (2 BB, an opponent may be trying to see the flop cheaply and this may indicate a weak hand. The Big Blind should probably call or raise with a wider range.

Raised by Small Blind

This is the case where it was limped or folded to the Small Blind and the Small Blind raises. This is a possible steal attempt. The Big Blind should probably raise or call with wider ranges.

Hand History

If the Hand History box is checked before clicking Run, Hand History files will be created for every hand played.

CAUTION: Use no more than about 25,000 hands or importing hands into an application like Holdem Manager 2 will take a very long time. 25,00 Hand Histories can be created in less than a second. Importing them can take several minutes.

If you are Skeptical of Full Simulation

If you are skeptical of the Simulation, use a tool like Holdem Manager 2 to validate. Most serious players use Holdem Manager or similar application to study their own play and the play of opponents. If you don't already have such a program, try the trial version. Well worth it.

Import a few thousand Hand History files, then use a hand re-player to verify that the game is being played correctly and that players actions are reasonable. Look at stats like VPIP and verify against the PeakHoldem report or the Ranges used by Hero or an Opponent.

If You Want Another Way to Analyze

Many of us have used applications like Holdem Manager, which we recommend, for years to analyze our play. So it is a reliable, familiar application. However you have used it before, use it that way now. Whatever statistics you have relied on before, do so now. Expect a few surprises though. Not because of errors necessarily but because the optimizer frequently produces different Strategies than you are accustomed to. After all, that is the purpose of PeakHoldem. How about a preflop three-bet range higher than your Open range. Hmm. Maybe our opponent profile is inaccurate, but just maybe your Open in position and three-bet in position are too low. Curious? Read one of the new books like "Exploitative Play in Live Poker". Maybe the Optimizer discovered something We thought it might be a bug until we read the book.

Along the way, we have found a lot of things that have surprised us. A lot of things that we thought impractical at first, like MDF, that turned out to be rock solid.

Anyway, use as always. It does not know where the Hand Histories really came from.

The Flop, Turn, and River

A little More Theory

Preflop ranges are relatively simple to understand. A Range represents a frequency. It is composed of the best hands for the selected frequency. They control all preflop actions. Opponents Ranges are based on real data. The user Ranges can be Optimized manually or automatically and are entirely in response to opponent Ranges.

Preflop builds a foundation for all of the other streets. It exposes the first layer of opponent mistakes that can be exploited.

The flop is considered to be the most difficult street. This the point where you see 5 of the 7 cards that will make up your hand or draw. Lots of complicated decisions follow.

Things change dramatically on the Flop. Position, such as Button, is no longer the consideration. Preflop, the Button Open range was wider than other positions primarily because the Button will have position over all of the other players. Always last to act. A huge advantage. The position is still a critical consideration after on the Flop, but if all folded preflop except the UTG and MP. MP has position heads up. In effect, the MP player is now the button. His hole cards on the Flop are still the result of the MP Ranges but the positional advantage has changed.

We handle this by using ranges that are based on preflop position but are for the new relative position. First, Middle, Last, First Heads Up, and Last Heads Up.

The first step is to look at the board and determine a couple of things. What made hand or draw that you have and the board texture. The Simulator will base its initial decisions based on that and a Rules table. The Rules table, of course, has a specialized editor for each street. It tells the simulator what to do. About 1/3 of flops, depending on preflop Ranges, result in a playable hand. The rest are candidates to fold.

Folding all of the failed hands would be very foolish for many reasons. A fit or fold strategy simply does not work.

If we do not have a playable hand, we are far from done. Time for Exploitation and a little Game Theory Optimal GTO. There are several basic exploitations.

1. A simple bluff.
2. Continuation Betting C-Bet.
3. Minimum Defense Frequency. A far better way to bluff.
4. Barreling.

Many other forms of Exploitation will be available in the paid version and some in the next free version.

We will not waste a lot of time on simple bluffing. It is what your opponents do but not the best Strategy for you. MDF is far better. What your Average opponent does is to bluff at some frequency.

There are several things that we must accomplish with Flop, Turn, and River Strategy:

1. All Ranges result from a precise Frequency.
2. All Ranges must use the best hands possible.
3. All Ranges must have randomness to avoid being exploitable.
4. All Ranges must include considerations such as board texture.
5. All Ranges must consider opponents possible hands.

We do all of these things. We start with the preflop range that got us here. The hole cards that we have now were determined by a preflop Range. If we want to do something on the Flop a certain percentage of the time, we use a percentage of the preflop Range. For example, if we want to C-Bet 70% of the time, we make the decision with the best 70% of the preflop range. That becomes our Flop Range. That accomplishes the first 3 requirements. Simple, but very effective.

We define Ranges based on board texture. For example, we have a C-Bet range for Wet, Dry, and Neutral board textures. The basis for each Range is the preflop Range. The C-Bet is only considered when the player was the preflop raiser.

Continuation bets are a form of Exploitation. If Hero opened preflop, then Hero should usually bet again on the Flop. The C-Bet range is based on preflop actions. An old tactic that still works.

How To Use

We talked a little about the theory on the Flop, Turn, and River. In this section, we will talk about how to do it.

- You should probably start with Rules for Made Hands. Looks complicated but you probably have most or all in your head already. Try changing the defaults to the way that you play. Yep, look for changes in your win rate.
- Try things like always checking a Flush. What happens?
- Try Minimum Defense Frequencies MDF next. If you are familiar with Game Theory Optimal GTO you already understand.
- Very few people have figured out how to use MDF in a real Game. We make it simple. The MDF for a street MUST be based on the preflop range that you used. If the calculated MDF is 0.666 (Half pot bet), then a Range for the Flop.

When you get to post-flop rules, it can be intimidating at first. But, you have most of these rules in your head already.

Everyone who plays Hold'em has a set of rules in his head. For example, on the Flop, in position, if you have Top Pair, you raise. But that decision may be influenced by the board texture and opponent action.

Another important consideration is if you are Heads Up or Multi-Way. The number of combinations is huge. You already have it in your head, so start by describing what you do now. It takes about an hour to update your rules. It does not have to be completely accurate at first because you will be changing rules and seeing the effect on your win rate.

There are three menu bar selections for Flop, Turn, and River. Each one has items to select Draw Heads Up, Made Hands Heads Up. Draws Multi-Way, and Made Hands Multi-way for that street. Selecting an item causes a window to appear for editing Rules.

In every case, there are radio buttons to select the player type, position, hand, board texture, an opponent's action. No opponent action if you selected first to act.

The player action radio button for the already selected rule will be checked. You can change it or just move on if you consider it to be correct.

After you have made the changes you want to click the Save button.

You can have multiple windows open at the same time but must not edit both at the same time. There is one rule file for each street and position.

Rules

The windows for all rule editors are basically the same. They differ in street, Heads Up vs. Multi-Way, and hand type.

The first row of radio buttons selects the player type. You are the Hero.

The second row of radio buttons is the position. First to Act, Middle Position, and Last to Act First To Act Heads Up, and Last to Act Heads Up.

After preflop, specific positions, such as Button, lose relevance. In effect, if the Button folds then the player that acted before the Button becomes the new Button. The preflop Ranges that got us to the Flop, Turn, or River are still important to creating Ranges because they are the basis for Ranges on the other streets.

The value of the position is very important on every street. On the flop and after, it is the relative position that is important. Being Last to Act Heads Up is by far the best position to be in and you can play more loosely. Note that Relative position can change again on both the Turn and the River.

The default Rules for Hero have been Optimized. You may want to edit depending on your style of play or your Opponents style of play.

Made Hands Heads Up

A made hand may range from over cards to a straight flush. How you play it heads up is obviously different than multi-way and position (first to act vs. last to act) make a big difference.

Draws Heads Up

A drawing hand may range nothing but a backdoor flush to flush draw and a pair. How you play it heads up is obviously different than multi-way and position (first to act vs. last to act) make a big difference.

Made Hands Multi-Way

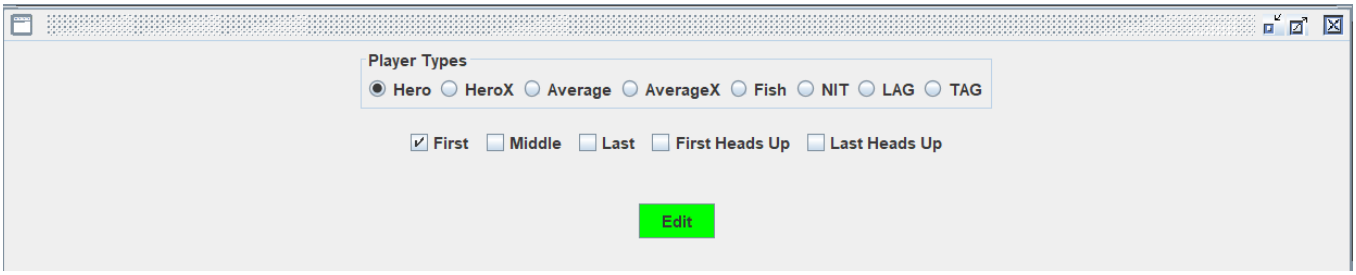
A made hand may range from over cards to a straight flush. How you play it multi-way is obviously different than heads up. The middle position is especially different.

Draws Multi-Way

A drawing hand may range nothing but a backdoor flush to flush draw and a pair. How you play it multi-way is obviously different than heads up. The middle position is very different.

Editing Rules

Note: Numbers in the graphic were from before the final Release 2.0 and may not match the released version.



Note: Numbers in the graphic were from before the final Release 2.0 and may not match the released version.

FLOP First Rules ---- Number 0

Hand	No Bet	Bet1	Bet2	Bet3	Bet4	Allin
None	Check	Fold	----	----	----	----
Overcards	Check	Fold	----	----	----	----
Ace High	Check	Fold	----	----	----	----
Weak Pair	Check	Fold	----	----	----	----
Middle Pair	Check	Fold	----	----	----	----
Pocket Pair Below Top	Check	Call	Fold	----	----	----
Over Pair	Check	Call	Fold	----	----	----
Top Pair	Check	Call	Fold	----	----	----
Gutshot	Check	Call	Fold	----	----	----
Gutshot High	Check	Call	Fold	----	----	----
Gutshot Draw Pair	Check	Call	Call	Fold	----	----
Straight Draw	Bet	Call	Call	Fold	----	----
Flush Draw	Bet	Bet	Call	Call	Fold	----
Straight Draw Pair	Bet	Call	Call	Fold	----	----
Flush Draw Pair	Bet	Bet	Call	Call	Fold	----
Flush Draw Gutshot	Bet	Bet	Call	Call	Fold	----
Flush Draw OESD	Bet	Bet	Call	Call	Fold	----
Two Pair	Bet	Bet	Call	Call	Fold	----
Three of a kind	Bet	Bet	Bet	Call	Call	Call
Straight	Bet	Bet	Call	Call	Call	Call
Flush	Bet	Bet	Call	Call	Call	Call
Full House	Bet	Bet	Bet	Bet	Call	Call
Four of a kind	Bet	Bet	Bet	Bet	Allin	Allin
Straight Flush	Bet	Bet	Bet	Bet	Allin	Call
Royal Flush	Bet	Bet	Bet	Bet	Allin	Call

Bluff Ranges

Bluffing is an important element in Hold'em play. Techniques such as bluffing at random or using the second hand on your watch don't work well. You should always bluff with the hands that have the highest Expected Value.

If on the Flop, Turn, or River you have no hand or draw worth playing, your bluff is based on your hole cards. You select a percentage of your preflop range to bluff with.

As you can see in the MDF section of this manual the basic MDF equation is simple. But to accurately define that range you must consider the preflop hand that got you here, the Rules, C-Bet Ranges etc.. The MDF Range is the last range applied. And must include consideration of what happened before.

Bluff Ranges are simpler but must also include what happened before. Bluff Ranges are checked last.

MDF ranges provide a far better option, but your opponents probably do not use MDF. The hero should use MDF and opponents use bluffing ranges.

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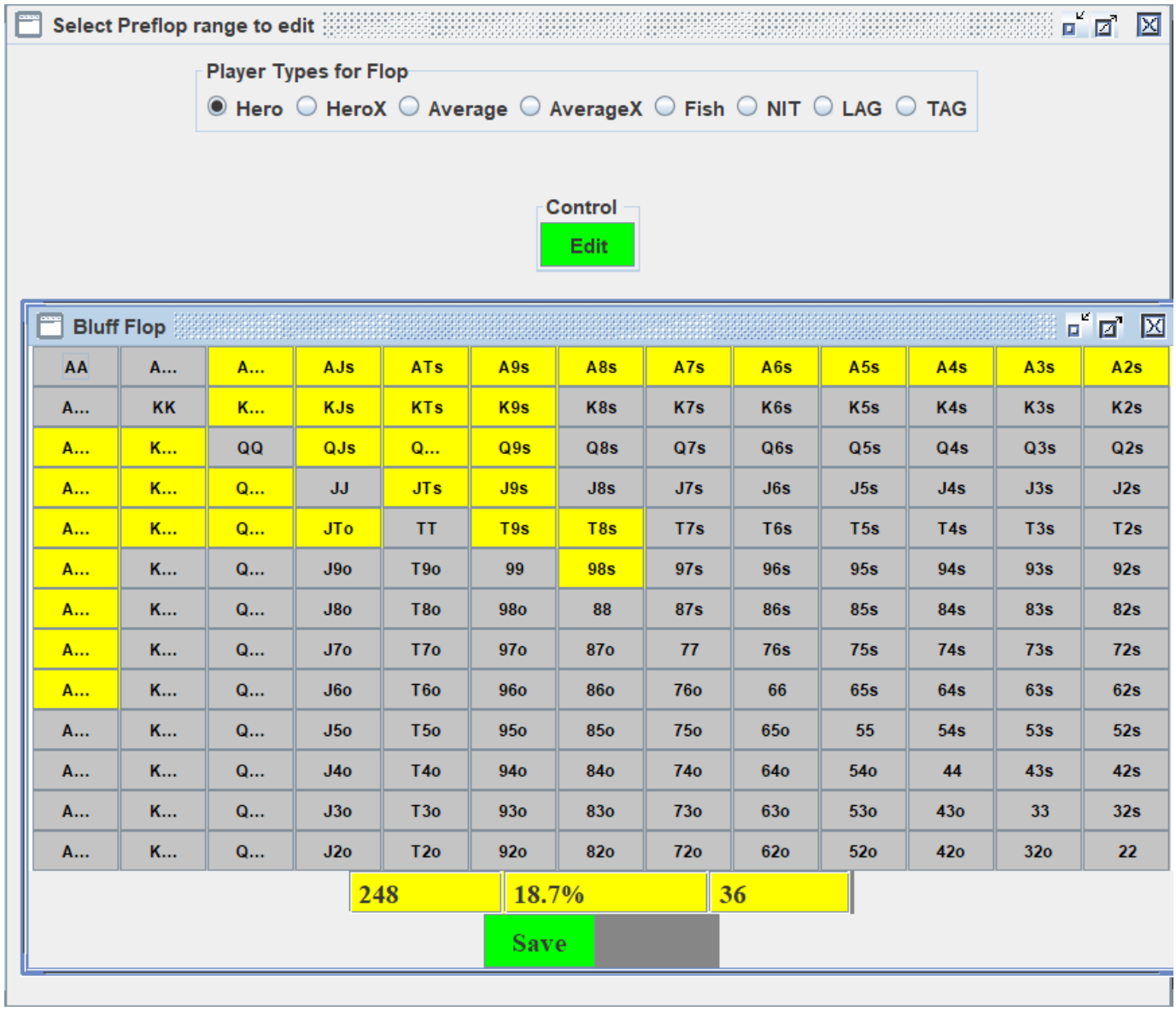

Game Theory Optimal GTO

Theory

Of all the many benefits of PeakHoldem, being able to implement elements of GTO such as MDF is the most valuable.

If there were 2 computers, each with Artificial Intelligence, and they played against each other, constantly adjusting to each others strategy, they would eventually reach equilibrium. Both would have a perfect strategy that the other computer could not exploit. But, neither would win or lose.

You would never intentionally play against the AI computer for the money. In the real world, you play against humans that do not have a perfect game and that mistake. It is a simple fact that the AI strategy is far from perfect when it comes to Win Rate. AI assumes that their opponent does not make mistakes.

That does not mean that AI or GTO is bad. But it is not Optimal, just not exploitable. Understanding that fact, how can we use it in a real game against imperfect opponents? It would be very foolish to ignore such a valuable tool. We need to understand how to use it.

We could look at the AI database, only a few terabytes. I don't think that is possible for me, but then I am getting old.

We can ask the AI computer specific questions and it will tell us the answer. There are millions of possible questions so we have to be selective. There are software products that allow you to do just that.

Please don't get me wrong, both AI and GTO are very valuable tools. We just need to understand what and how they can be used. One good example is the Minimum Defense Frequency MDF.

Game Theory Optimal has not been well accepted by Hold'em players. They believe that is too complicated, impractical, and not the best strategy against weak opponents. There is a general consensus that exploitative play results in the nest win rate. There is a good reason for those beliefs.

Throwing out GTO would be a huge mistake. The problem is how to use it in the real world, where your opponents make a lot of mistakes, and exploitation is therefore important. So the question is how to best use the theory behind GTO but still, use exploitation.

Existing applications, books, coaching websites, and coaches have not, to the best of our knowledge, come up with a practical way to use GTO. There are several Solvers but they are all limited to specific and limited cases. Great for finding the highest EV play heads up on one street. Not for an entire game.

We are trying to make the theoretical practical. No human is able to play GTO poker in real time, at the table. Game Theory Optimal (GTO) and Minimum Defense Frequency (MDF) are indisputably mathematically correct, but not easy to use.

If you can't use GTO against random opponents, then you should still take advantage of GTO. The idea is to discover how to use GTO theory to improve my your win rate, in a way that is practical to use, vs. conventional wisdom strategy or exploitative play strategy.

What we are researching is practical GTO based alternatives, that can be applied in real-time, at the table. This can be done by developing ranges away from the table.

We simulated this basic approach and observed improvements in win rates that astonished us.

Using simulation in 6 max no limit, we have been able to dramatically improve win rate on every street and every position. We first evaluate hands (flush draw, Top pair, etc. then reduce by the calculated MDF, by the hit rate (oversimplification). What remains is the strongest hole card range that you should continue with (not fold).

A big mistake is in trying to choose between exploitative play and GTO play. They can be used together in a relatively simple and usable way.

MDF is the first GTO strategy that we have ready to use. Others are in development.

Minimum Defense Frequency

Let's look at Minimum Defense Frequency (MDF) first. No complex math, just ranges, that can be automatically generated or Optimized.

How about exploiting opponents mistakes? MDF does exactly that. Most players make frequency mistakes, even the best players. They may fold too often, call too often, C-Bet too often, raise too often, or bluff too often. MDF exploits all of that and more.

If your opponent's mistakes are randomly distributed, then there is no default exploitative play that can counter that. Most of us play against unknown opponents most of the time and against known opponents some of the time.

With a good base like MDF is useful because you only have to think about and remember deviations.

Take MDF on the flop as an example, with a half pot bet the MDF is 66.6%. Apply blindly and you will lose. But there is a way to do it right.

First. Play as you normally would on the flop. You would never fold a set just because of a calculated frequency. You would not raise for value with nothing. If you have top pair, go ahead and raise.

Your normal actions establish a frequency. Over a large number of hands, this will generally average out to be between 20% and 35% depending on your style of play. If you use Holdem Manager or Poker Tracker you can easily find out what your average is. We exclude that number from the MDF range.

Next, look at your preflop range. Did you open, call, 2 bet, raise to 3 bet etc.. Your flop range **must** be a subset of that specific range. Those are the cards that you get to the flop with. In order to reach the continuation number of 66.6%, you will need to continue with hands that you would have folded.

You can easily establish a percentage of your flop hands and draws that you will continue with regardless. Say that is 22% for the sake of discussion. Remove the weakest 22% from your preflop range. Play them for value. Remove 22% from your MDF number, it's now 44% Use the 44% to again reduce your preflop range, removing the weakest hands first. Use this range to make your continuation decision. The result will be a continuation (MDF) percentage that is closer to the 66.6% number. Still not exact, just much closer. It will take some experimentation to determine your best MDF range. The change in win rates is dramatic.

We are trying to separate the theoretical from the practical. But we are not capable of playing GTO poker in real time. I don't know anyone who is.

If we can't play GTO against random opponents, then I need to be able to take advantage of GTO even if it is not perfect. The whole idea is to discover how to use GTO theory to improve my win rate vs. conventional wisdom or exploitative play.

What we are researching is practical alternatives that can be applied in real-time at the table. I can memorize a range that I develop away from the table using simulation. It will not be perfect, just practical.

I have simulated this basic approach and observed improvements in win rates that astonished me. Just believe that there must be a better way.

We have reached a different conclusion. Using simulation in 6 max no limit, I have been able to dramatically improve the win rate on every street and every position. I first evaluate hands (flush draw, Top pair, etc. then reduce the calculated MDF by the hit rate (oversimplification). What remains is the strongest hole card range that I continue with (not fold). I am sure it works, but I am equally sure that there is a better way

Example of MDF

Let's start with a simple example: You are playing against one opponent, you bet half the pot 100% of the time, but your cards are blank. Your opponent folds to your bet 50% the time. Then at showdown. You always muck.

The pot is 10. You bet 5, half of the pot. When your opponent folds, you win 10. When he calls, you lose 5 every time. When you don't bet you lose nothing.

EV = (win $ * % win) - (lose $ * % lose)

EV = (10 * 50%) - (5 * 50%)
EV = (5) - (2.5) = 2.5

You win 2.5 (on average) every hand.

Think about that for a minute. Using MDF against an opponent with the wrong fold frequency, you win with blank cards. Imagine if you got real cards and had the best hand 50% of the time.

MDF is the fraction of your range that you must continue with when facing a bet to prevent your opponent from profitably bluffing any two cards. To calculate MDF for your opponent:

MDF = pot / pot + bet

MDF = 10 / 15 = .66.

Your opponent should fold 66%.

Calculate EV again

EV = (10 * 33%) - (5 * 66%)

EV = (3.3) - (3.3) = 0

It's important to note that with the correct MDF you can not be exploited by opponent bluffs.

It's the frequency that is important. MDF also depends on the pot size.
10 / 10 + 5 = .66. 1/2 pot.
10 / 10 + 10 = .33. pot.

10 / 10 + 2.5 = .80 1/4 pot.

Editing MDF Ranges

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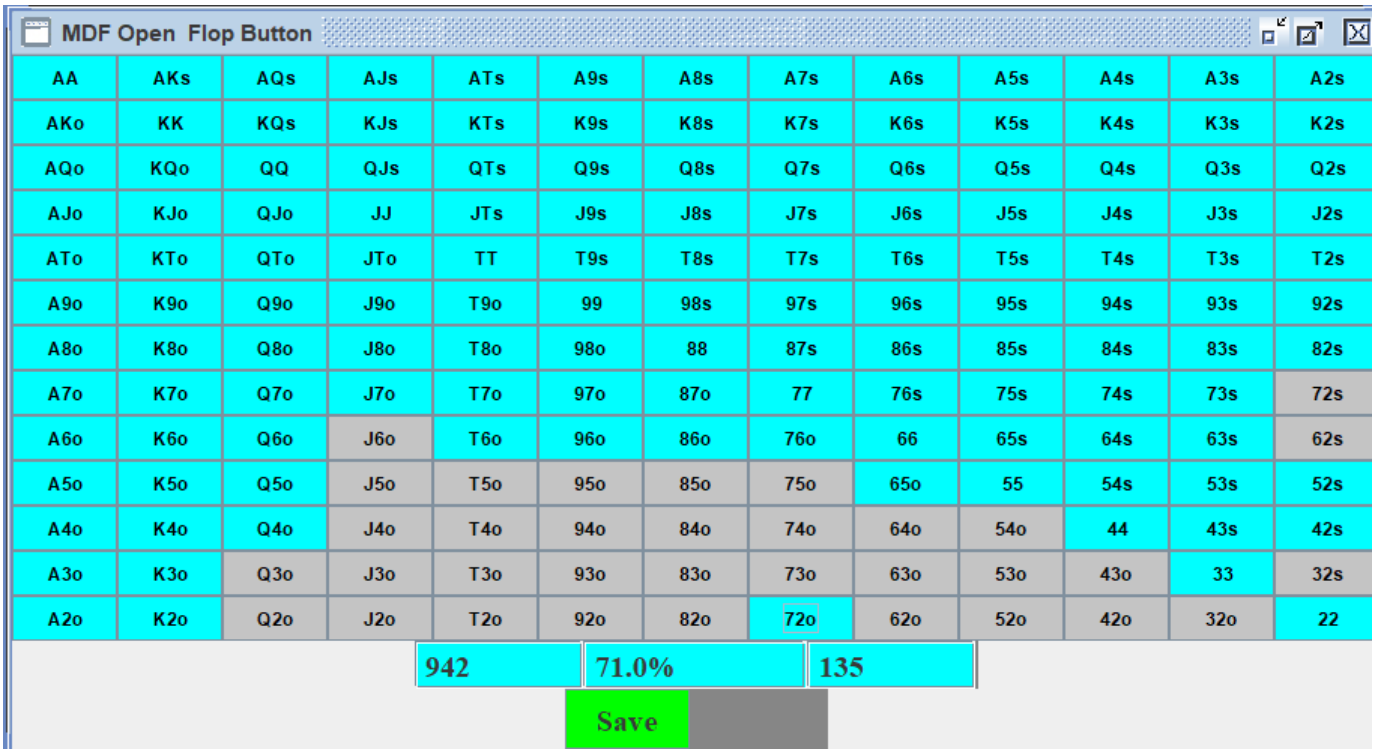

And of course, all of the automatically generated MDF ranges can be edited.

Select GTO on the menu bar then Edit MDF. As in the other editors, there are rows of Radio Buttons.

The first row of radio buttons selects the player type. Once again you are the Hero.

The second row of radio buttons selects the position.

The third row of radio buttons selects the street.

The fourth row of radio buttons select the Preflop actions. MDF ranges are based on your Preflop range, which will be different if you open raised or called.

Click Edit. The now familiar hand matrix will appear and can be edited. Be sure to click Save when you are done.

We recommend that you first Automatically Generate the MDF ranges first, then edit them individually. Saves a lot of work.

Automatic Generation of MDF

From the menu bar select, "GTO" then select "Automatically Generate MDF Ranges."

The first row of Radio Buttons selects the player type. You are the Hero.

The second row allows you to select the street. We recommend "All."

The next row allows you to select a method to be used in choosing the method for card selection in the MDF ranges. We recommend Expected Value.

The next row selects bet size. We recommend ½ pot.

The MDF is calculated and displayed. You can change the value (not recommended).

Click the Generate button. MDF ranges will be generated for all positions for all of the streets

selected.

MDF is based on your Preflop ranges using both your Open range and your Call range. If the MDF is 66.6, then a range for both a Preflop call and a Preflop open raise are constructed using 66.6% on the Flop, 44.3% on the Turn and 29.5% on the River.

The ranges are automatically adjusted for the percentage of the time that you will have a made hand or a draw on the Flop, Turn, and River. If you happen to Flop a made hand or draw then the Rules tables are used.

In future releases, we will include other MDF ranges such as Fold Equity.

Optimizing MDF

Finding Optimum MDF Ranges is far from simple. MDF is always the last consideration after all other Ranges and Rules have been applied. MDF simply means that after other considerations that we will continue with the hand with the goal of achieving the best Win Rate.

The default MDF Ranges for Hero has been somewhat optimized in the free version. Precise in the paid version. But the default Hero Ranges are far better than anything else that we are aware of. Not difficult to use at the table.

The Optimizer is not available for use yet but will be soon. Meanwhile, enjoy the benefits and win a lot more.

Continuation Bet

You raise preflop, then represent a strong hand by raising again on the Flop. That is a C-Bet. It still works.

A few years ago, about 2008, the C-Bet was generally recommended nearly 100% of the time. Good advice then. Times changed and players changed. Then the recommendation became to C-Bet mostly on dry Flops. They said you would be representing a strong hand when your opponent was unlikely to have hit the board. Maybe good advice then, not so much now.

Studies of the game, done with analysis applications such as Holdem Manager, say different. The rate that opponents fold to a C-Bet has very little to do with the board being wet or dry. Easily verified.

Many players routinely make poor C-Bets following obsolete advice. If your opponent folds, it's most likely because he missed the flop and has nothing to do with you. It's not about what you hold, it's only about what your opponent holds.

With all of that in mind, we can more clearly think about when to C-Bet. A 742 Flop clearly rates a C-Bet while a Q88 Flop is usually a not because no one is going to fold if they hold a Q or an 8. A 975 flop is wet but is us unlikely your opponent holds an 8 or a 6 to make a gut-shot draw. How about a monochrome board, three cards of the same suit. Great for stealing the pot. An opponent will flop a Flush on a monochrome board about 7.5% of the time.

Other ideas to consider before making a C-Bet are Ranges and Frequencies. To make yourself unexploited you must include a random factor. A range is a good way to do that.

Keep in mind that the Continuation Bet Ranges are applied after Rules.

Continuation Bet Ranges are also based on board analysis. In the current release, we use Wet, Dry, and Neutral. The basic definition is that a Wet Flop has a lot of draws. A dry Flop has few draws. A Neutral flop is neither. The actual analysis is a bit more difficult than that but most people can do a pretty good job determining which is which. PeakHoldem has an algorithm that is pretty accurate.

We are working on more advanced algorithms for board analysis but they are not complete yet.

See the section on Board Texture for more.

Be sure to look at the related reports. There is a lot of useful information there.

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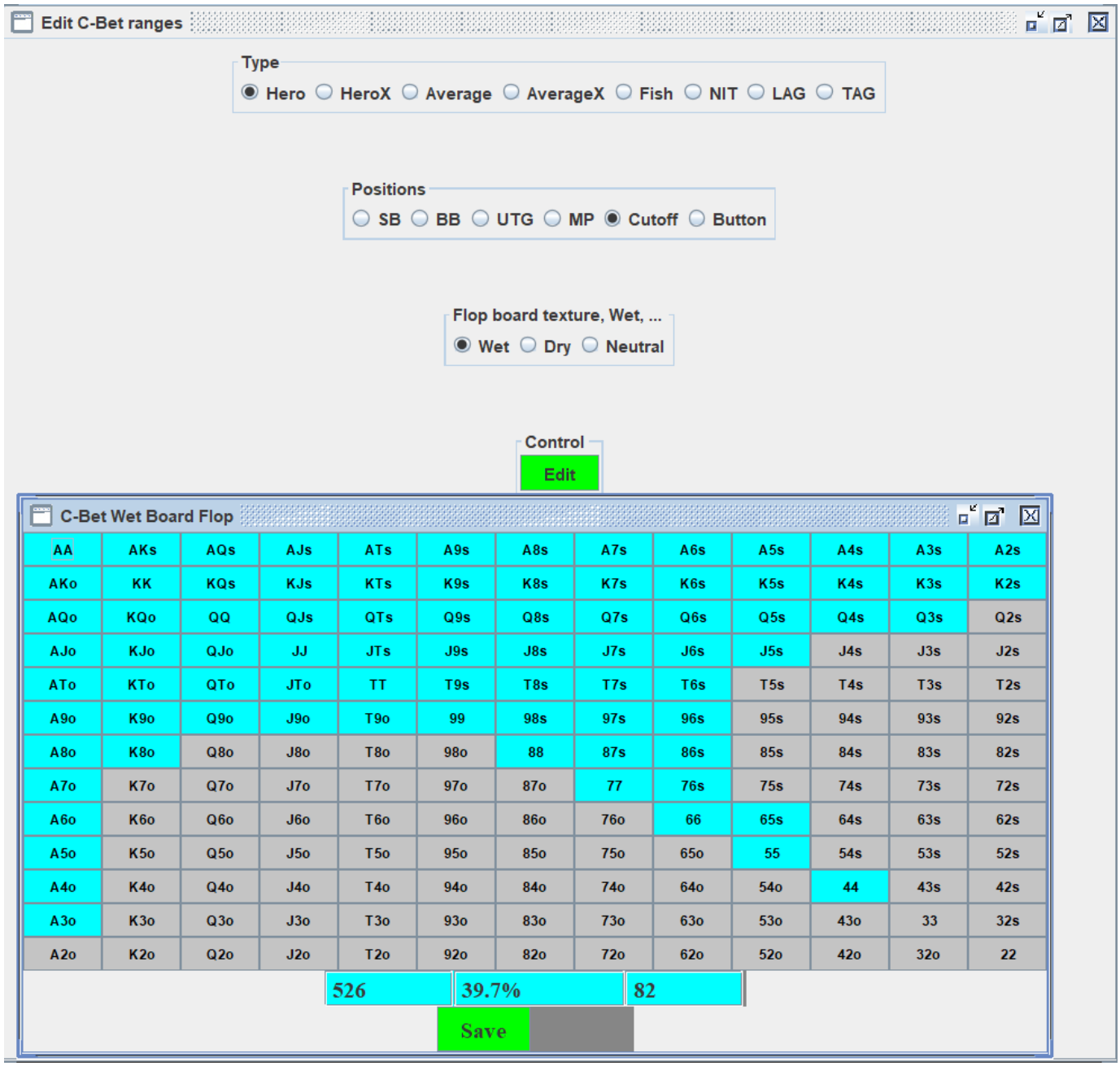

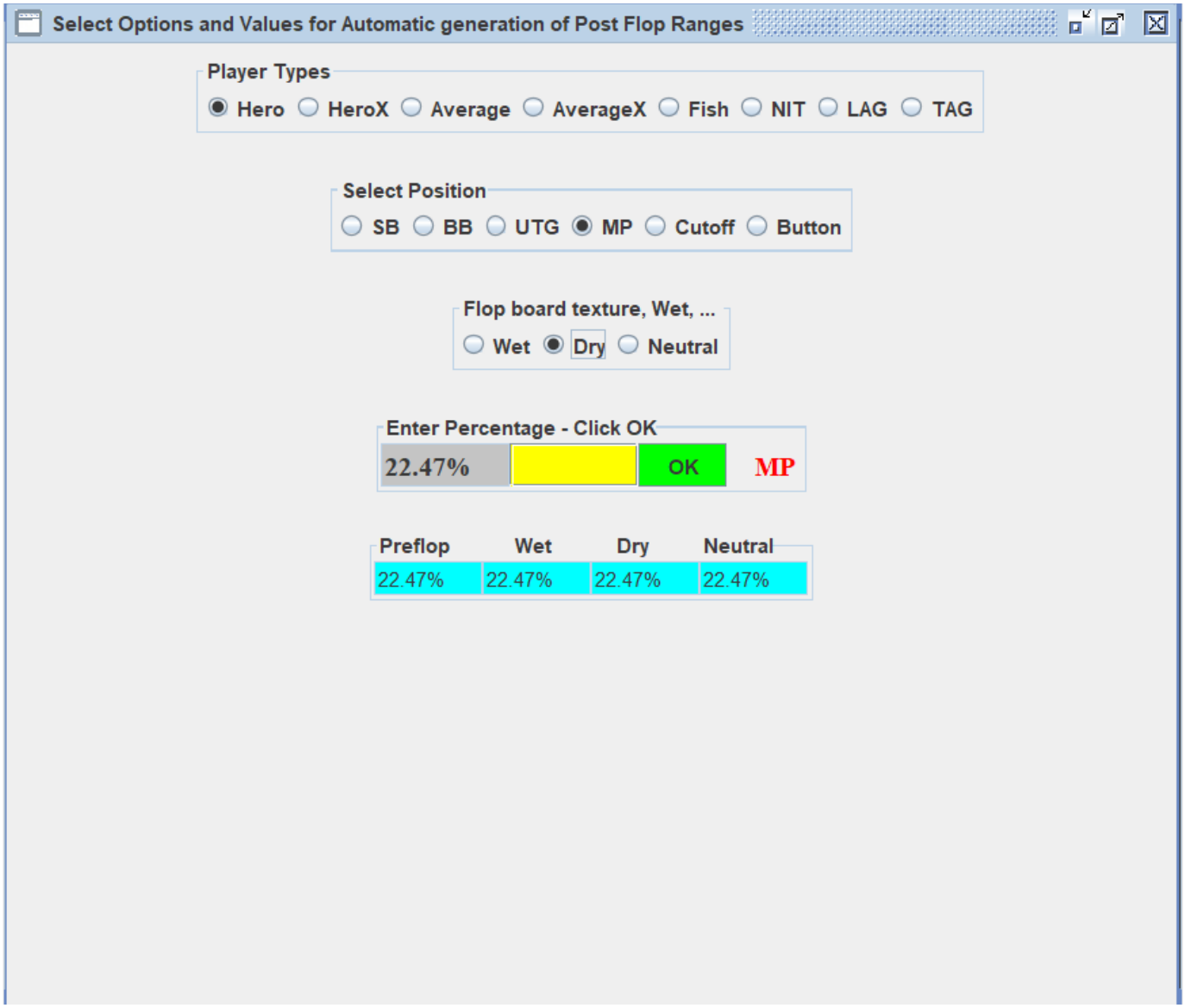
Select Options and Values for Automatic generation of Post Flop Ranges
Player Types
Hero HeroX Average AverageX Fish NIT LAG TAG
Select Position
SB BB UTG MP Cutoff Button
Flop board texture, Wet, ...
Wet Dry Neutral
Enter Percentage - Click OK
22.47%
OK
MP
Preflop Wet Dry Neutral
22.47% 22.47% 22.47% 22.47%

Flop Board Analysis

The first step is relatively simple, figure out what hand or draw you have. Then decide on a Strategy based on Rules.

The second step is much more difficult, the Flop board texture. Ranges are also based on board analysis. In the current release, we use Wet, Dry, and Neutral. The basic definition is that a Wet Flop has a lot of draws. A dry Flop has few draws. A Neutral flop is neither. The actual analysis is a bit more difficult than that but most people can do a pretty good job determining which is which. PeakHoldem has an algorithm that is pretty accurate.

There are a lot more steps, but let's start with the flop board and how to simplify evaluation. It's not all that simple but if we have a methodical method for this simplification it becomes manageable.

Flop board analysis.

1. Mentally sort the cards in order, high to low. So 7cKs9c becomes Ks9c7c.

2. The 19,600 possible flops (your hole cards removed) are reduced to 10 buckets. HHH to LLL. H = A-T, M = 9-6, L = 5-2. Now you have a much better chance of analyzing any Flop.

3. For each of the 10 possible Flop buckets look for the following

Rainbow - No cards of the same suit.
A pair - Any 3 cards the same rank.
Ace High - Any Ace.
Two suited - Two cards of the same suit.
Gap 0 - Connected cards. 8c7d.
Gap 1 - One gap between cards. 7c9c.

With this, we have a manageable framework that we can use for evaluation.

4. Now we can categorize Flops as Wet Dry None or Static Dynamic None.
A wet flop is one with lots of draws. A dry flop is one with few draw possibilities. None is in between.

A static flop is one where the winning hand is likely already made. dynamic flop is one where the winning hand has not been made yet.

A couple of general guidelines:

1. A monochrome flop board is almost always wet.
2. A paired flop board is almost always dry.
3. HHH is almost never dry but can be neutral.
4. LLL is almost never wet but can be neutral.

Before classifying a Flop board as Wet / Dry or Static / Dynamic we need to do a mental gap count. A gap is a distance in the value of 2 cards. 7c6d or 3d2c are both gap 0. 7d9c and KsJh are both gap1. 8d6d and Qs9h are gap2. AhKcTh. is both a gap 0 and a gap2. They will help us to evaluate the Flop for Straight or Gutshot possibilities.

Let's look more closely at AhKcTh. It fits into the bucket HHH, is a Rainbow, Ace high, and no pair. The Ah limits the Open-Ended Straight Draw OESD possibilities because only single ended Straights are

possible and there are only 4 outs to a Straight. Because most preflop ranges include AK hands Ax hands the possibility of a made hand is likely.

Back to gaps. We can assign points to gap 0 and to gap 2. AhKcTh vs. KcQsTh. The KcQsTh flop has an OESD possible which is 8 outs, is a gap0 and a gap1. Obviously, we will score them differently.

What does an OESD gap0 worth. It depends on the number of hole card combinations that will make a draw. For example QdJ2h:
AsKd will make a straight draw but not OESD.
KcTc will make an OESD.
Td9d will make an OESD.
Kc8s will make a Gutshot.

That is not all of the combinations but demonstrates the basic idea. In the example above, the hole cards that are commonly opened or called with include big cards, Ax, suited connectors, and pairs. In a flop like Jh6d5s could make an OESD but the hole cards 4x3x or 8x7x seldom make it to a Flop.

Barreling

Theory

There is an important transition in thinking than poker players must make to become really good at the game. In the beginning, we all focused on our hands, out outs, our odds. That is an important early step. But with experience, we learn to focus more on your opponent than your hands.

Later we must change our focus from our hands to our opponent's hands and worry less about our cards. You start to make bets based on what your opponent possibly holds. If your opponent will fold it does not matter what cards you hold. It is a little hard to accept at first. But math backs it up.

Think about strategy vs. strategy. A strategy often discussed in poker articles and books is “You check, I bet”. As simple as that. Assume a $1 bet and your raises are all ½ pot. You always lose showdown.

Assume that if your opponent checks and you bet, that he will fold ½ the time. Sounds foolish, maybe, but let's check the math.

EV = (.5 x 1) + (.25 x 2) + (.125 x 4) + (.125 x -7) = 1 + 1 + 1 - .87 = 2.13 = +EV

This works best at low limit games because your opponents play too many hands preflop.

Like all strategies, this needs to be adjusted based on your opponents. A calling station will not fold often enough but average opponents will.

Editing Barrel Ranges

Editing Barrel Ranges is very much like the other Ranges. Same 13 x 13 matrix.

As a reminder, Barreling Ranges are Evaluated after Rules are applied and before MFD Ranges are applied.

Editing

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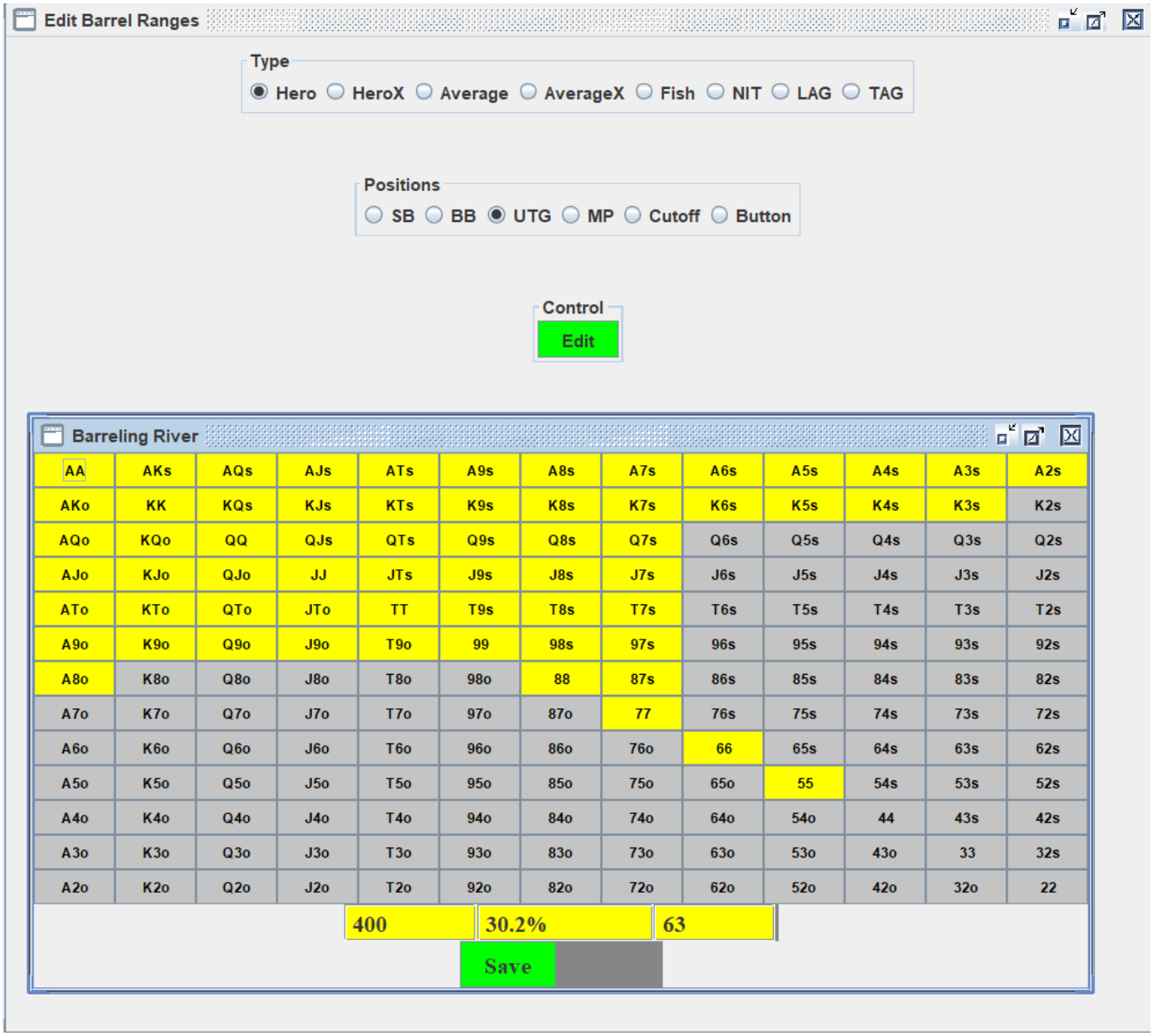

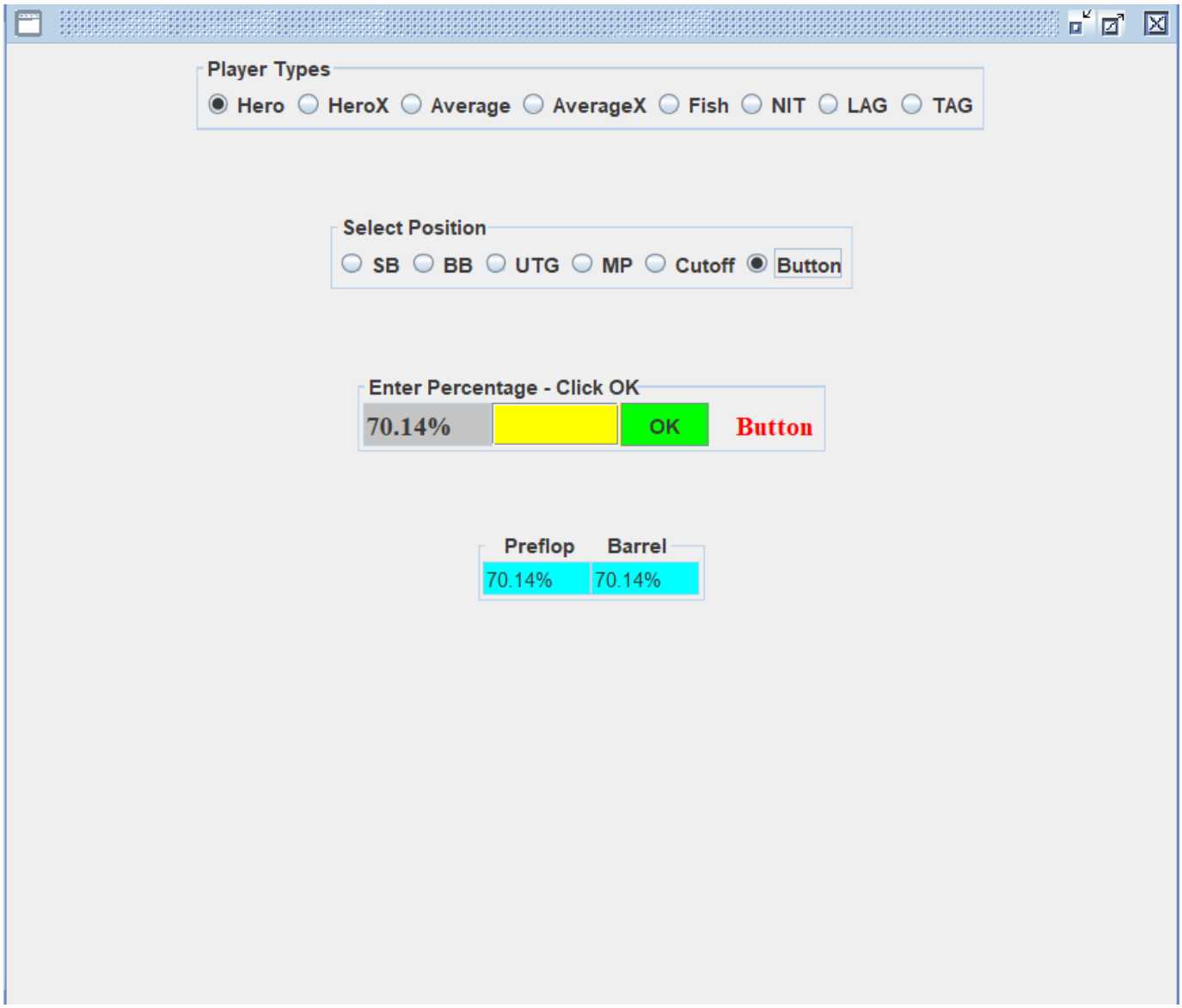
Player Types
Hero
HeroX
Average
AverageX
Fish
NIT
LAG
TAG
Select Position
SB
BB
UTG
MP
Cutoff
Button
Enter Percentage - Click OK
70.14%
OK
Button
Preflop
Barrel
70.14%
70.14%

Check Raise

Available soon.

Delayed Continuation Bet

Available soon.

Floating

Available soon

Options

There are a lot of options that you can edit and change. Our intent is to make everything in the Strategy Database editable (even the colors used by our editors). We are not done yet but are working on it.

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Note that changing player types also change EV. You should run the EV calculation utility after making significant changes and also rerun Preflop Automatic Generation and MDF Automatic Generation.

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When you sit down at a table it is likely that all or most opponents are unknown to you. The average is your best default assumption until you know more about them. Some statistics, such as VPIP, become useful in as few as 50 hands. Many statistics take thousands of hands to converge.

Player Types

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Nit: Is a player who is very tight. A "nit" will only engage in hands in which they are almost certain that they are ahead. For example, a "nit" may only raise hands such as QQ, KK, AA and maybe AK.

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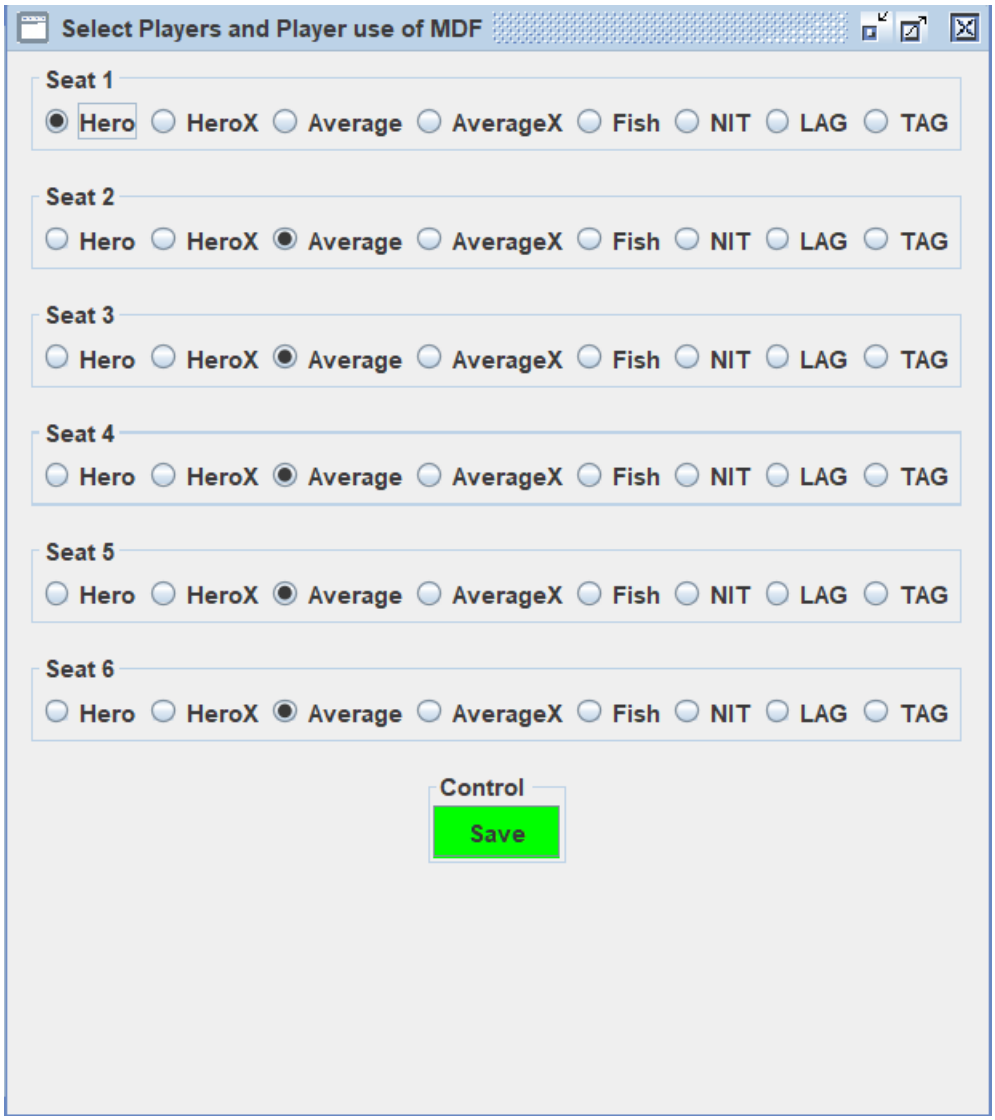
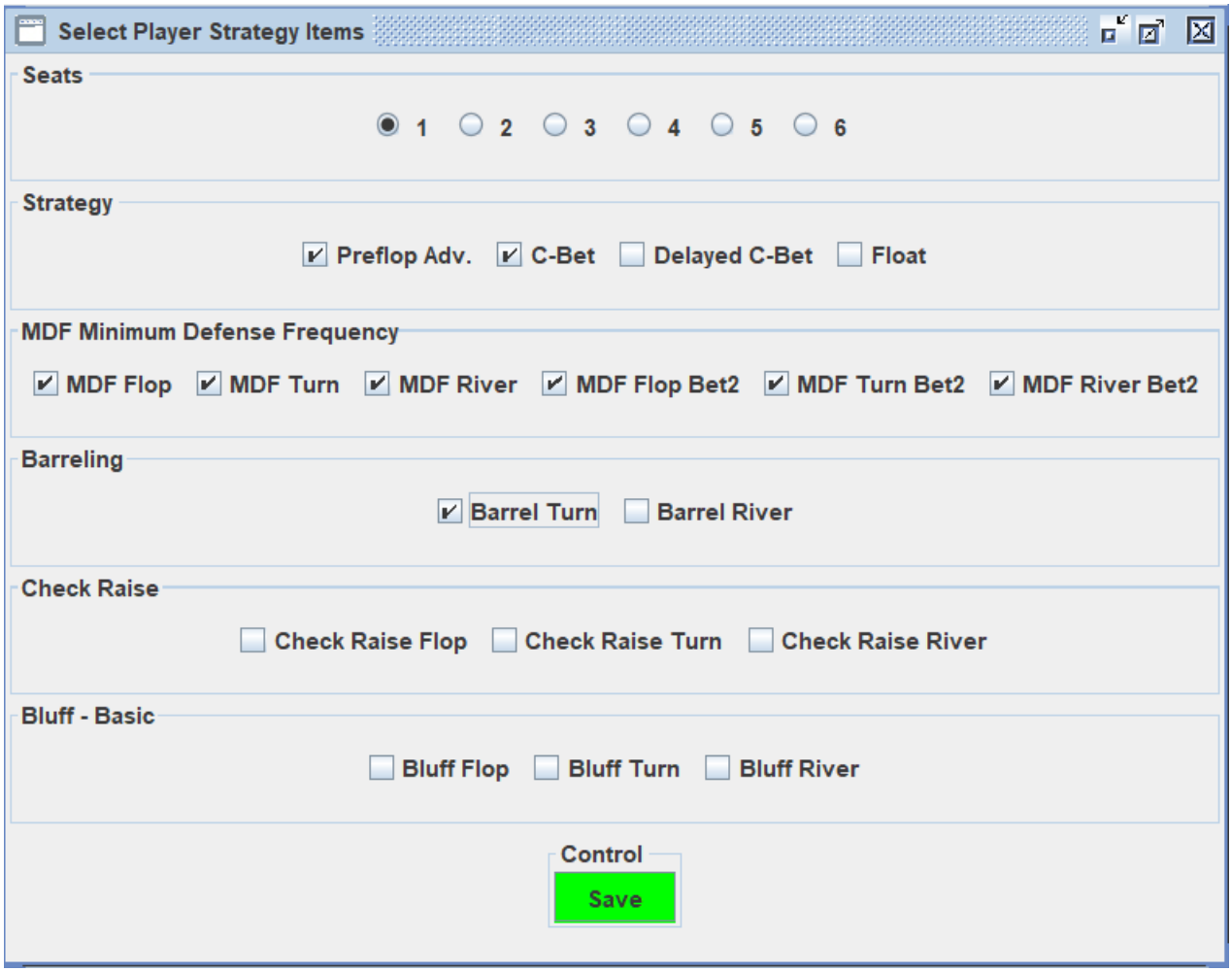
TAG: The average grinder employs a TAG poker strategy and many players should learn a TAG style before doing anything else. TAG is an abbreviation for “Tight, Aggressive” and is in between a nit and a LAG.

Assign Player Types to a Seat



Player Strategies by Seat

This option allows you to select individual strategies by seat number.



General Configuration

Available soon,

Reports

Reports are now in a separate document. The number of reports has increased dramatically. More information on how to use Reports to analyze your game has been added to Reports.

How Reports Are Obtained

Understanding the various reports is vital to improving your Game and Win Rate.

The many reports are a very useful byproduct of the Simulator. All that it needs to do extra is to keep information gathered while running. A little extra overhead, but with no significant effect on performance. When a player folds, we simply add it to a counter or counters. We simply record what happens.

One advantage is that the Simulator will also tell us why it did what it did. For example, when the Simulator makes a bet, call, raise, or call raise on the Flop, it will record that it was done for MDF. No guessing so complex analysis required. Also much more accurate.

Some of the reports are basic information, that can be obtained from other applications or verified with other applications. Like how often you will a starting Range make a particular draw or made hand on the flop. We report it for your convenience. The numbers may not be exactly the same because the others general base their numbers on static calculations. Ours includes how the players react to a situation.

Simulation makes it possible to report things never done before with any accuracy. For example, most of us are familiar with the preflop equity of a hand. How about the Expected Value for every street. Because we simulate a full game with player actions, not some simple static case, we can very closely estimate the Expected Value of every preflop hand on every street. The EV of a hand preflop and the EV of that same hand on the River are very different. Can't actually be mathematically calculated because the equations do not, and can not, take into account players actions. Ever made a Flush on the flop only to see everyone fold. Simulation of a full game is not perfect but produces accurate answers.

It's almost always the relationship that is important. Is AsJd a better hand than 7c7h on the Flop. The important thing is not the three decimal points, but which one is bigger.

Ever thought about the Expected Value of a hand or draw on the Flop? There is absolutely such a thing and knowing it is extremely valuable. Problem is, with simple calculations, how you and your opponents react changes the hand EV or draw EV dramatically. You have pocket AA and two AA on the board. Quads. And they all fold. Life is not fair.

Full game simulation is able to come up with a close approximation. No claim that they are perfect but pretty darn close. Math does not do the trick here.

The simulator analyzes board types, like Wet, Dry, or Neutral. Simple enough. But it can also use the board type to determine how often a C Bet on a wet board is effective vs a Dry or vs. a Neutral board. Sure enough, there are reports for this. Many more are in the coding or design phase.

Report Types

There are several categories of reports:

- Basic reports. Play reports by seat number, position, and street.
- Hand hits. How often a particular hand is made on each street.
- Hole card EV. The Expected Value for Preflop hole cards for the Flop, Turn and River.
- Hand EV. The EV for hands such as a Straight Draw are calculated for each street.
- Board Reports.

There are many reports available on the Run Window. They are selected by check boxes and are displayed after the specified number of hands have been played. Some simple and some complex. For most reports, we recommend that at least 100,000 hands be played. Some statistics, such as VPIP, converge quickly. Some such as EV require the 100,000 hands to converge. The Game Engine is very fast, so big run numbers are not a problem.

Applications like Holdem Manager and Poker Tracker can also be used for analysis by exporting Hand Histories from PeakHoldem. Use caution on the number of hands exported.

In all cases, multiple copies of any report can be open and on the screen at the same time to facilitate making comparisons after editing Strategy.

Getting a Report

Could not be simpler. The main screen has several rows of checkboxes. Click on the box to see the report. There is no effect on performance. The reports are generated after a run is complete from data collected during the run.

Beware of selecting too many reports at one time. You can end up with a very cluttered screen. It's best to do one or two at a time, then close the report after you look at it.

To use reports to evaluate results after making a strategy change, the reports are left on the screen, as before and after. Want to know something obscure, like does a change in preflop range change the EV of a made hand on the River? Maybe not so useful, but an interesting question anyway. We have not made any attempt to think too far into how you might want to use reported information. Use your imagination.

Basic Reports

Summary

The summary report is by seat number. The basic columns are:

- Win$. How much was won or lost by seat.
- BB/100. Big Bets/100. Instead of dollars, we use Big Bets.
- VPIP. Voluntarily Put Money in the pot. Call or bet. Forced bets excluded.
- PFR. Preflop raise percentage.
- Continue Flop. How many times you did not fold on this street.
- Continue Turn. How many times you did not fold on this street.
- Continue. River. How many times you did not fold on this street.

The columns are probably already familiar to you. Continue may not be. It becomes very important when you use Minimum Defense Frequencies. If your calculated MDF is 66.6% then you should be folding 333% of the time and Continuing (Check, Call, Raise) should be 66.6%. If you are already there, then great! If not, you can improve your win rate a lot. (See the section on MDF.)

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Average: Average and AverageX are your average opponents. We suggest using Hold'em Manager 3 to find the average of all of your real opponents, then edit their Strategies.

When you sit down at a table it is likely that all or most opponents are unknown to you. The average is your best default assumption until you know more about them. Some statistics, such as VPIP, become useful in as few as 50 hands. Many statistics take thousands of hands to converge.

Fish: Look for him and play against him at every opportunity. He is the one that makes the most mistakes and the most easily exploited. There are many types of fish and they tend to be unpredictable. They frustrate many players when they never seem to fold.

Nit: Is a player who is very tight. A "nit" will only engage in hands in which they are almost certain that they are ahead. For example, a "nit" may only raise hands such as QQ, KK, AA and maybe AK.

LAG: In poker, "loose aggressive" refers to a player who gets involved in many pots and plays his hands aggressively. An acronym for the loose aggressive player is "LAG."

TAG: The average grinder employs a TAG poker strategy and many players should learn a TAG style before doing anything else. TAG is an abbreviation for “Tight, Aggressive” and is in between a nit and a LAG.

File Menu

Backup and Copy

From the menu bar select File then one of the backup and copy options. All options copy the directory and all subdirectories. Backup and copy are very fast and it's a good idea to use them after making a lot of changes.

Backup and Restore

Every file in the PeakHoldem database is copied. The default backup directory is C:\PeakBackup.

Copy

These options copy one player type to another. They are not interned for backup. Their intended use is for saving a Strategy that you are happy with, Hero to HeroX or Average to AverageX so that you can easily save changes and continue experimenting. You can also assign them to a seat and have them play against each other.

Utility Menu

PeakHoldem is able to do calculations such as Expected Value for all starting hands based on the simulated play of both you and your opponents. The calculations are not mathematically precise, but it is the ranking that is important. For example, which hand has the higher EV, 99 and JTs are very close in Equity but which has the higher EV is most important. We are not aware of any other application that does this calculation.

Currently the only option is to restore default Rules. Others will be added as soon as testing is complete.

How You Can Help Improve PeakHoldem

We are damn good programmers but not great Hold'em players. Suggestions for improvements from you will be very valuable.

The need for bug reports is obvious. We try hard to avoid them but we do make mistakes. Please report all bugs on our website.

Please, if you have a good idea let us know. Mention it in our Forum so that others can comment on it.

The PeakHoldem.com website has several user forums. Please use them freely.

Help

Help comes in several forms and will evolve as the product matures and new code is developed.

There are two basic forms of help - a website based and application based. This manual and other documentation are available on peakholdem.com. There you will find other documents, Forums, Support for bug reporting, Checking for Updates, Downloading Updates, all the usual that most poker websites have.

Local help is more limited. There are Quick Start and Introduction pages. More to come.

Patent Pending

Some of the ideas used in this product are very unique, and we have applied for a patent, Copyright protection, and Trademark protection.

Serial Number 62/732,519.