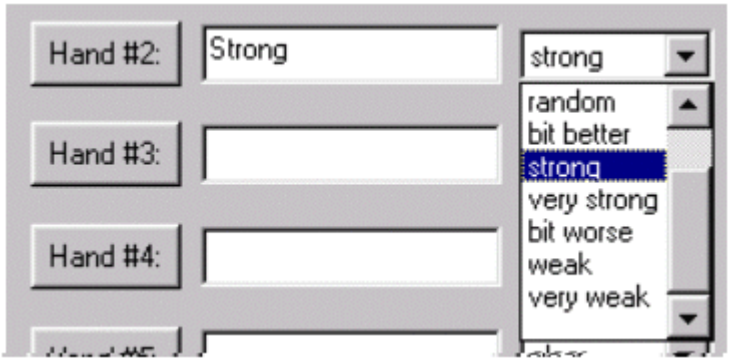
Biased Opponent Pockets

A very important feature in *Poker Drill Master* is the ability to bias the value of starting opponent pockets. A subtle, but mostly ignored, problem with computing hand equity against unknown opponents is that we often assume their pocket hands are chosen randomly. The reality is that if your opponents called bets or even raised pre-flop, then they are far more likely to have better than average pocket cards.

You can model this *Poker Drill Master* in both Calculator and Drill Mode.

Biased Opponent Pockets in Calculator Mode

A drop down list of preset options is available besides every hand in Calculator Mode.



After the 'random' choice are all the biased opponent options. 'bit better', 'strong' and 'very strong' improve the opponent pocket selection in increasing order. 'bit worse', 'weak' and 'very weak' worsen the opponent pocket selection increasingly. These options work by modifying the process of selection for the opponent pocket cards as follows:

- When one or more biased opponent hands are selected, the simulation is always random, rather than exhaustive. When there only random or fully specified opponent pockets, the calculator automatically figures out if it can exhaustively run every permutation of the game, or runs a few million random games instead. Biasing the opponent hands forces a random 'Monte Carlo' approach always, which means you may see slightly differences in the results if you rerun the setup.
- A biased hand will tend to have more suited pockets and pocket pairs (or less, for weak hands). In addition, the selection of the card ranks will tend to higher values for strong bias (10 to ace), and lower ranks for weak bias (2 to 7). You can see the actual bias values in the 'Internal biased opponent hands' section of the simulation reports. The bottom line shows the expected results for a truly random selection process.

Internal biased opponent hands probabilities:

Bias	Suited pocket %	Unsuited pocket %	Pocket pairs %
Bit better	36.36%	54.55%	9.09%
Strong	48.48%	36.36%	15.15%
Very strong	54.55%	27.27%	18.18%
Bit worse	13.79%	82.76%	3.45%
weak	9.76%	87.80%	2.44%
Very weak	4.49%	94.38%	1.12%
Random	23.53%	70.59%	5.88%

Internal biased opponent rank probabilities:

Bias	2	3	4	5	6	7	8
Bit better	4.76%	4.76%	4.76%	4.76%	4.76%	4.76%	4.76
Strong	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00
Very strong	3.57%	3.57%	3.57%	3.57%	3.57%	3.57%	3.57
Bit worse	9.52%	9.52%	9.52%	9.52%	9.52%	9.52%	9.52
weak	10.53%	10.53%	10.53%	10.53%	10.53%	10.53%	5.26
Very weak	13.64%	9.09%	9.09%	9.09%	9.09%	13.64%	9.09
Random	7.69%	7.69%	7.69%	7.69%	7.69%	7.69%	7.69

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- Each 1000 random rounds in the calculator simulation will choose a different biased opponent pockets. The process of choosing non-overlapping biased opponent hands is time consuming, so it is only done every 1000 rounds. Selecting biased opponent hands results is slower simulations compared to random opponents, but the net effect is much more realistic and conservative equity values.

Let's look at an example of how biased opponent hands can have a real impact on your decisions and value of your hands. Consider the following table from Drill Mode. You have a middle pair against one opponent.

If we copy this to Calculator Mode and assume our opponent has a random hand, then we have a healthy 75% equity.

Poker Drill Master - Calculator mode

File Command View Help

D C S O ?

Board: 2c 4d 7d Kh 9s

- Board/Hand buttons: set corresponding cards
- Or, specify the cards manually (i.e. 4d th ks)

Player hands

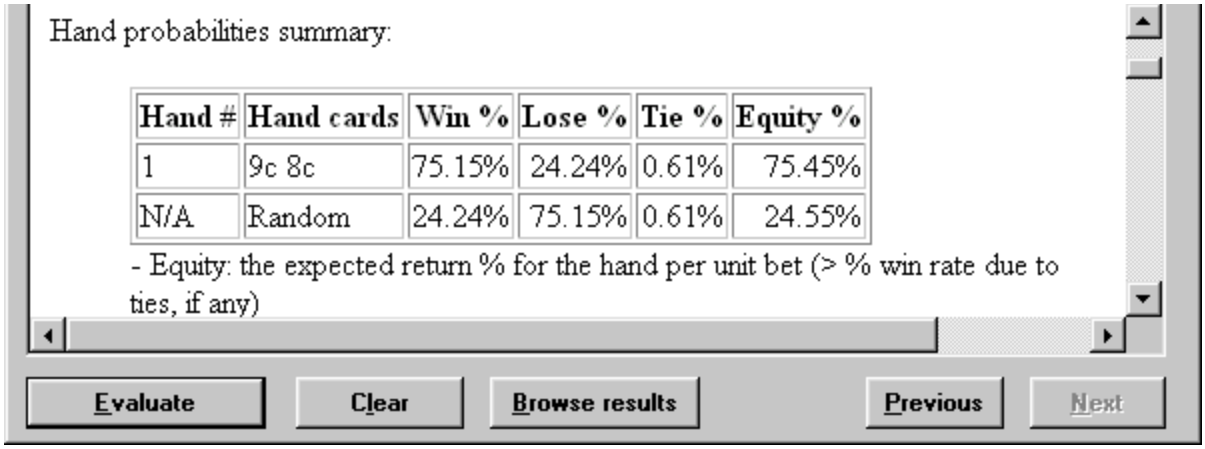
Hand #1:	9c 8c	[presets]	Hand #6:		[presets]
Hand #2:	Random	[presets]	Hand #7:		[presets]
Hand #3:		[presets]	Hand #8:		[presets]
Hand #4:		[presets]	Hand #9:		[presets]
Hand #5:		[presets]	Hand #10:		[presets]

Report:

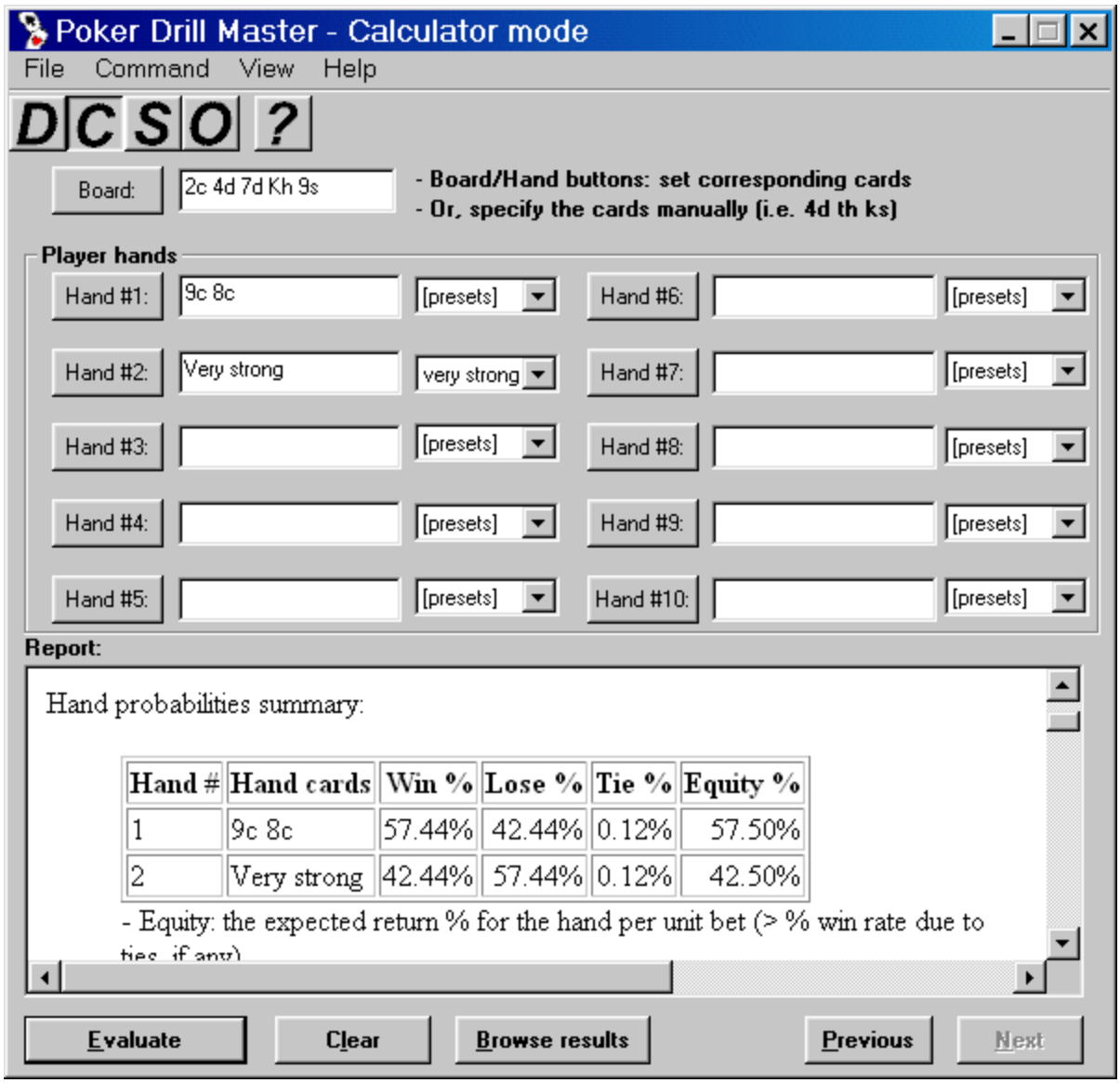
Hand probabilities summary:

Hand #	Hand cards	Win %	Lose %	Tie %	Equity %
1	9c 8c	75.15%	24.24%	0.61%	75.45%
N/A	Random	24.24%	75.15%	0.61%	24.55%

- Equity: the expected return % for the hand per unit bet (> % win rate due to



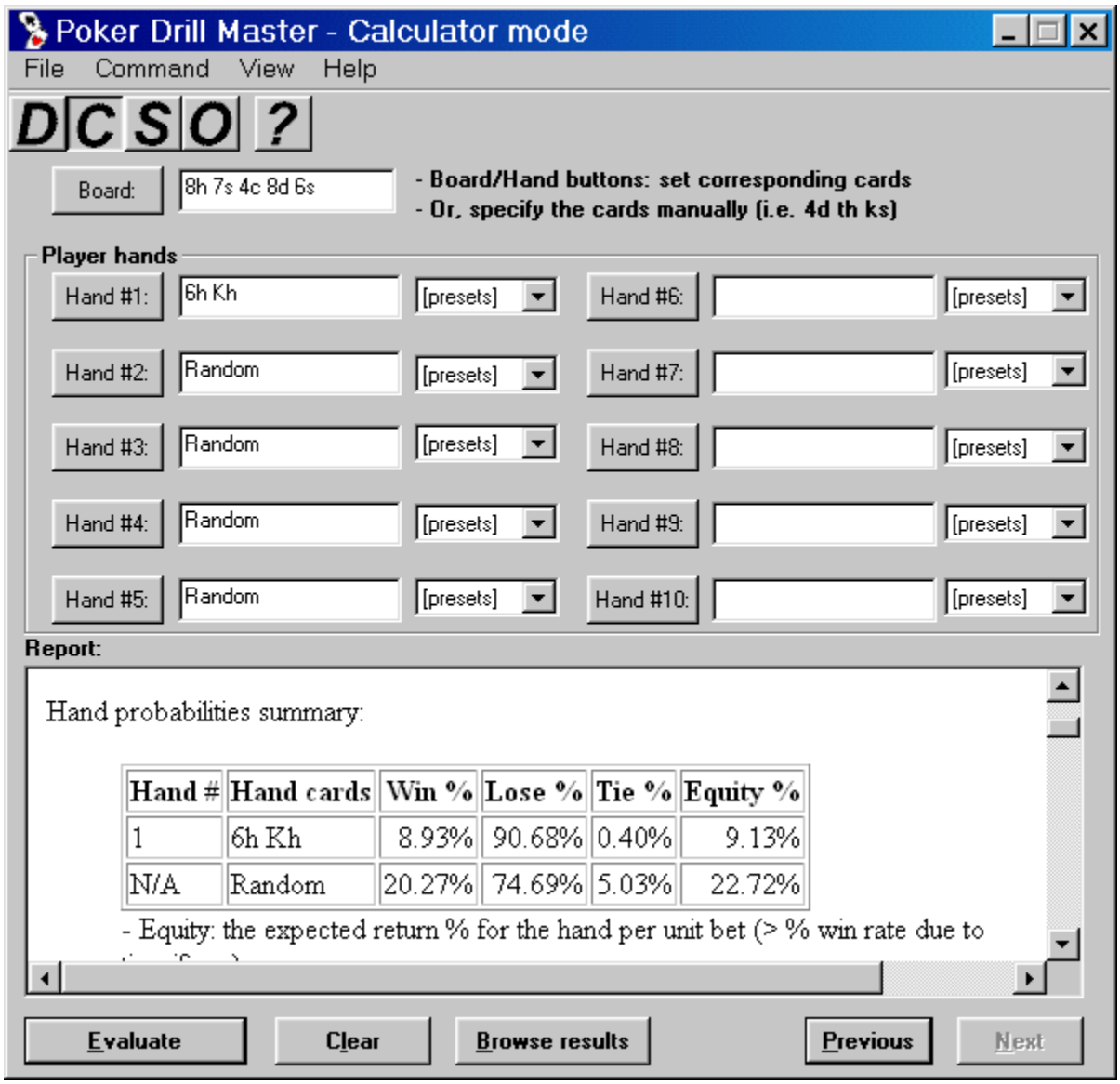
But suppose the player raised pre-flop, and we think they have a very strong starting pocket hand instead.



Now our equity is only 57%, only a bit better than our opponent. At 75%, we may have considered raising with the nines, but the reality is that a call is probably wiser.

Although generally our equity will worsen when we value the opponent hands

more strongly, there can be some unusual cases. Consider a board of '8h 7s 4c 8d 6s' when you have '6h Kh' against 4 other opponents. With a very low pair, you'd have a slim 10% equity against purely random opponents.



But what happens if we bias the opponent hands? Surprisingly, our equity improves substantially providing an equal playing field. This may seem very strange, but the biased hands will tend to higher ranks, which means they will pair up with the board less often. Without a flush opportunity, the opponent hands are likely to be high valued cards that just didn't match the board (less chance of holding the five for a straight, or eight for the trips).

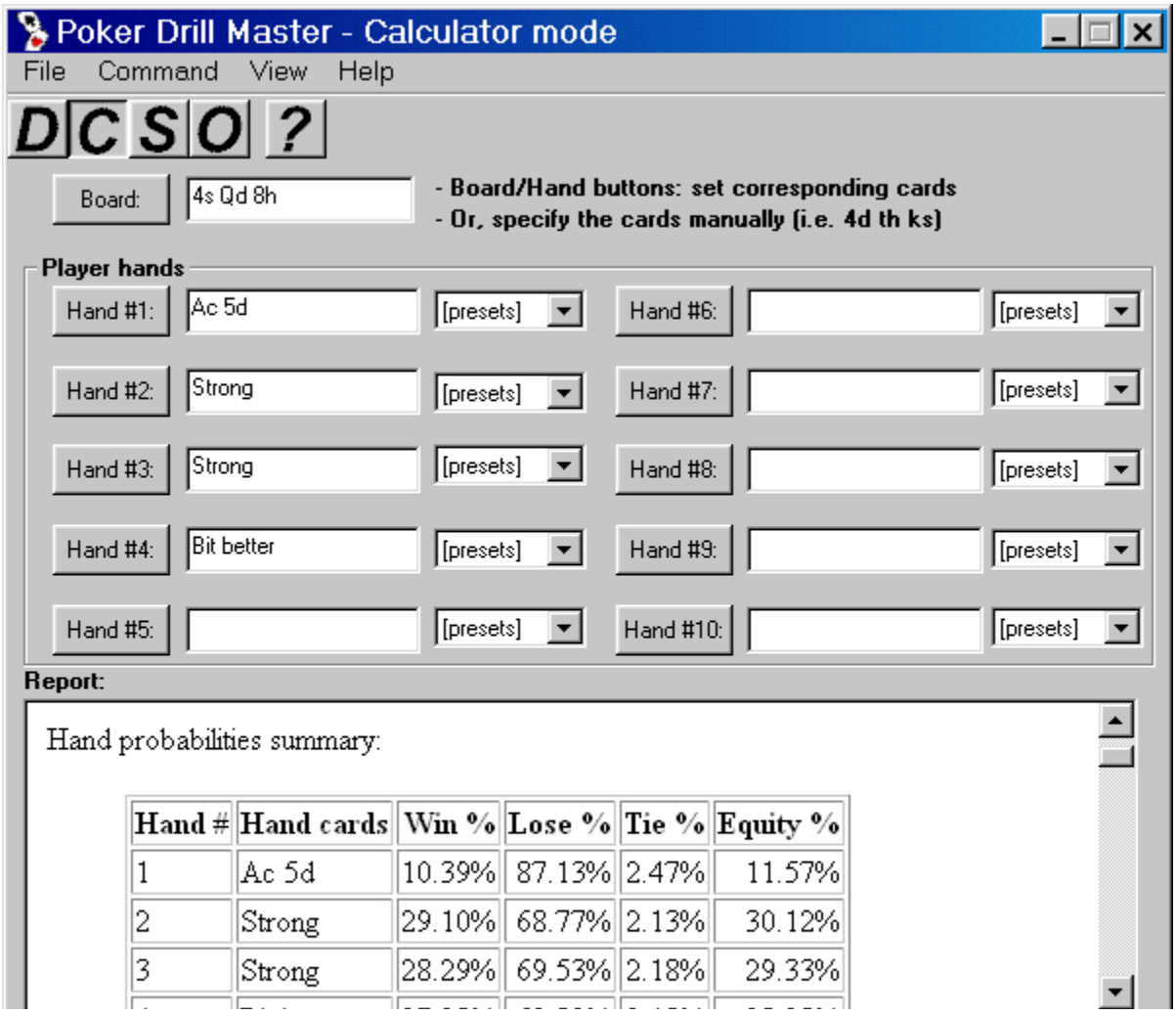
Hand probabilities summary:

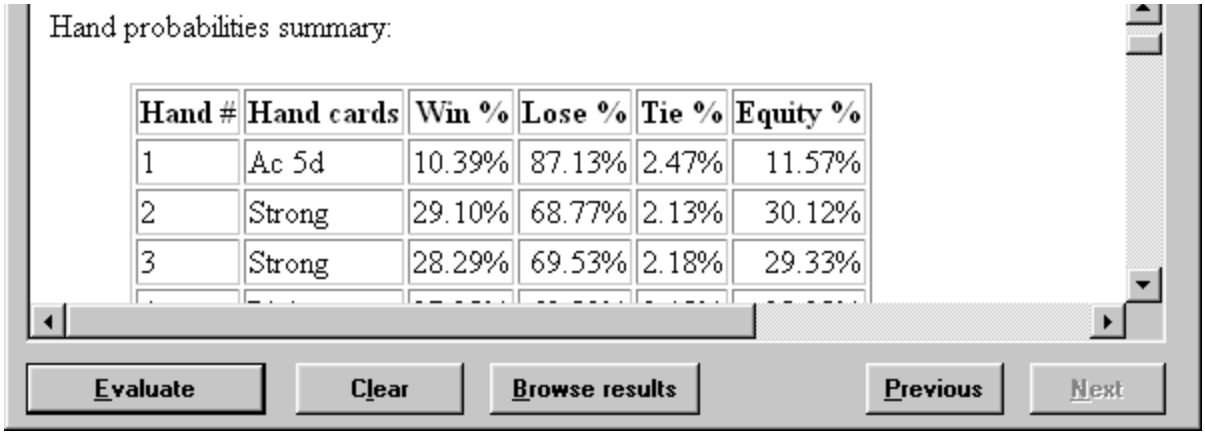
Hand #	Hand cards	Win %	Lose %	Tie %	Equity %
1	6h Kh	18.23%	80.99%	0.78%	18.62%
2	Bit better	18.78%	79.06%	2.16%	19.85%
3	Bit better	19.15%	78.65%	2.19%	20.24%
4	Strong	19.86%	78.19%	1.95%	20.82%
5	Very strong	19.52%	78.55%	1.93%	20.47%

Biased Opponent Pockets in Drill Mode

Depending on the value of the 'Opponents' hand strength' setting in the Options , opponent hands in Drill Mode will be biased toward stronger pocket hands. The default is to assume that opponents that call or raise tend to have stronger starting pocket cards.

As the table display is generated by the program, the assumed strength of the each opponent hand is raised slightly as they call bets. Strong raises further strengthen opponent hands. Consider the following table in Drill Mode.





If we click on the 'Copy to calculator' button, we can see the exact opponent hand biases selected by the program. The minimum of two calls for the first opponents gives them strong hands (at least one call in pre-flop, and one call in this round). The last opponent has yet to call after you, so their rating is only a 'bit better'.

You should generally assume that opponents have strong hands, especially if there are many callers or the pot is large. Predicting the exact strength of each opponent hand is not necessary though, as the impact on equity is usually not that larger as we choose higher biases. For example, in the case above assume the first opponent has a 'very strong' pocket hand. Their equity is higher at 32%, but the 'bit better' opponent is only slightly worse at 28%. This means that individual player betting history is still not an important factor in determining the equity and pot odds.

Hand probabilities summary:

Hand #	Hand cards	Win %	Lose %	Tie %	Equity %
1	Ac 5d	9.79%	87.82%	2.39%	10.93%
2	Very strong	31.46%	66.50%	2.04%	32.44%
3	Strong	27.96%	70.14%	1.90%	28.87%
4	Bit better	26.79%	71.22%	1.99%	27.75%

If the biasing of opponent hands bothers you, you can turn it off in the Options by setting the 'Opponents' hand strength' option to 'select randomly'. Choosing 'strong starting hands' is good if you are playing against very tight players, as it will accelerate the rating of opponent hands more quickly as the table is generated.