# Team The Powerpuff Girls

## Members:

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| **Name in BG:** | **Telerik User:** | **Git User:** |
| Вели Маджарова | velimira.madjarova | alexizvely |
| Гери Байлова | GeriCookie\_Bailova | GeriCookie |
| Дени Димитрова | shoko | DennyGD |

## Repository:

<https://github.com/alexizvely/The-Powerpuff-Girls>

## Information for the project:

We call Chances Evaluator method every turn. Based on the returned chances and the opponents action from the previous turn we decide whether to Fold, Call, Raise or go All In.

The chances evaluator logic is as follows:

* for pre-flop: uses the gap parameter and checks whether we have High Card or a Pair (Poker Probability - probabilistic)
* for all other rounds: uses Monte Carlo method (statistical) on 250 game trials

Tables used to determine the outcome for each action:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Fold** | **Call** | **Raise** | **AllIn** |
| Pre-Flop | | Gap 1: | High Card |  | 1 | 2 | 1 |
| Pair |  | 1 | 2 | 2 |
| Nor High Card or Pair | 1 | 1 | 1 | 1 |
| Gap from 2 to 3: | High Card |  | 2 | 2 |  |
| Pair |  | 2 | 2 | 1 |
| Nor High Card or Pair | 1 | 1 | 1 |  |
| Gap from 4 to 11: | High Card | 1 | 2 | 1 |  |
| Pair | 1 | 2 | 1 | 1 |
| Nor High Card or Pair | 2 | 2 | 1 |  |

The above table is used as initial evaluator of our chances.

The idea is to minimize the folds only to the cases where it is highly unlikely to win. Otherwise, we should proceed to the flop.

That way we will have some chance against bots that use aggressive tactics.

The chance values for each action are rolled for the next rounds. Hence, the chance values become more and more accurate with each turn. (in theory)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Chance in %** | |  |  |  |  |
|  |  | **Low** | **High** | **Fold** | **Call** | **Raise** | **AllIn** |
| Flop | | 0 | 15 | 1 |  |  |  |
| 16 | 34 | 1 | 1 |  |  |
| 35 | 40 |  | 1 | 1 |  |
| 41 | 51 |  | 1 | 1 | 1 |
| 52 | 100 |  |  | 1 | 1 |
| Turn | | 0 | 18 | 1 |  |  |  |
| 19 | 34 | 1 | 1 |  |  |
| 35 | 41 |  | 1 | 1 |  |
| 42 | 55 |  | 1 | 1 | 1 |
| 56 | 100 |  |  | 1 | 1 |
| River | | 0 | 20 | 1 |  |  |  |
| 21 | 36 | 1 | 1 |  |  |
| 37 | 45 |  | 1 | 1 |  |
| 46 | 62 |  | 1 | 1 | 1 |
| 63 | 100 |  |  | 1 | 1 |

Given the fact that we already have something generated for the action chance values – we simply need to add points where needed. Therefore, we add points only for the certain cases based on the chance calculated form Monte Carlo algorithm.

## Sources:

Keith Rule’s articles from CodeProject are our major source for the algorithm.

Links: <http://www.codeproject.com/Articles/19091/More-Texas-Holdem-Analysis-in-C-Part-1>

<http://www.codeproject.com/Articles/19092/More-Texas-Holdem-Analysis-in-C-Part-2>

<http://www.codeproject.com/Articles/12279/Fast-Texas-Holdem-Hand-Evaluation-and-Analysis>

Statistics for the action chance values: [Wikipedia](https://en.wikipedia.org/wiki/Texas_hold_%27em_starting_hands)