1. Use a Title that identifies your project's overall topic or situation.
2. The team member(s) names AND their GitHub IDs
3. Hypotheses:  Project Types I & II need to have hypotheses you are testing. 1-person teams must have at least 1 hypothesis, and larger teams should investigate more.
4. For Type III, you might hypothesize that there’s evidence for some additional conclusions the original publication missed.  But even if you don’t have hypotheses, you must describe why and in what ways you believe the original was flawed and suggest briefly how you plan to improve it.
5. Even if it's currently empty, add a link to your GitHub repository here so it's easy to find from your proposal later (it should be a FORK of this one: [https://github.com/iSchool-590pr/final\_project\_2020Sp](https://github.com/iSchool-590pr/final_project_2020Sp" \t "_blank)).
6. Please post your information here as simple inline text -- don't make us all download some attachment just to see what your project topic is.  Thank you.
7. Depending on Type of project, provide links to the data source(s) you'll use and any existing published code you're basing it on.

Title:

Simulation of competitive game player’s MMR(hidden skill rating) distribution using Monte Carlo Simulation.

Team member:

Xiaojun You(garagekit)

Proposal:

I am planning to use Monte Carlo Simulation to simulate the distribution of game player’s MMR distribution.

MMR means matchmaking rating, which is the hidden skill rating to determine the skill level of each player. If a player win a game, his MMR points would increase. If he lose a game, his MMR points would decrease. When a player plays more games, the more the MMR points reflects the player’s skill rating.

So I plan to use a simple game that would be affected by the players’ skill level and luck to simulate the matches among players. Then the players would randomly pick players with similar MMR to battle. After the matches, I would be able to get the updated MMR values of each player. According to their MMR points, the players would get their own different rank name, such as bronze, silver, gold and so on…

Variables:

1. the initial value of MMR

2. the compensation of winning probability for players with high MMR value in the game

3. the maximum MMR difference between two players in a randomly matched game(If the MMRs of the two players differ more than the maximum gap, the battle would not proceed)

4. the player's MMR change value after the game

5. the amount of games

Hypothesis:

1. the distribution of MMR would be more concentrated when the maximum MMR difference between two players in a randomly matched game decrease.

2. the distribution of MMR would be more concentrated when the initial value of MMR decrease.

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Hypothesis 1:

The distribution of players is clearly layered, and the strength gap is obvious.

Hypothesis 2:

The higher the MMR, the fewer the amount of players. The low-segment of MMR has larger number of players. It means that the high-level players are more rare.

Hypothesis 3:

The MMR of the players that have similar skill level would be concentrated distributed within the same rank. And the high rank, which means high-level MMR, would be more concentrated. It means that it is harder to widen the gaps among the high-level players. However, in the top rank segment(probably is the professional player segment), the MMR of these high-level players would not be concentrated distributed, and the gap would be more obvious.