Model Study on "WeChat Lucky Money"

—using Monte Carlo Simulation

Scenario & Background

- Famous activity or game in China on New Year's Eve and Spring Festival.
- Total amount of WeChat red packets received and dispatched was 13.2 billion on the eve of 2017.

Concept of WeChat Lucky Money

- One person send a certain amount of red envelope.
- The red envelope is divided into a certain number of small red envelopes.
- Other member of the group can grab a small red envelope and receive the lucky money.

Rules of Red Envelope Relay Game

- People who receive the highest amount of money in this round will issue the red envelopes in the next round.
- Different relay methods and game environments.
- Different influences on the wealth distribution situation of the members.

Implementation of Monte Carlo Simulation

- Use actual red envelopes money dataset to obtain the statistical distribution.
- Use Monte Carlo method to randomly produce simulated data based on the distribution before.
- Simulated data can effectively reflect the actual situation and can be used to study the model.

Build the model base on the rule of "Red Envelope Relay"

- A group has certain amount of people.
- At first, each people has equal amount of money or funds.
- One envelope can be divided into n small red envelopes.
- One game ends after 100 times of relays.
- We play the game for 100 times.
- Calculate the Gini coefficient after each game.
- Derive the probability distribution.

Gini Coefficient

- Judges the level of income distribution.
- Between 0 and 1.
- Smaller the Gini Coefficient, more equal the income distribution.
- Larger the Gini Coefficient, more unequal the income distribution.

Random Variables 1

- The amount of money in a red envelope.
- Use actual data to calculate the mean and var of the amount of red envelope.
- Predict how much money the person will actually sent out.
- Normal distribution.

Random Variables 2

- A red envelope can be divided into n small envelopes.
- n is the second variable.
- Uniform distribution.

Random Variables 3

- The amount of money in each small envelope.
- Use second variable n to randomly assign weight to each small envelope.
- Dirichlet distribution.

Future Plan

- Do the simulation.
- Make the number of people in a group to a variable.
- Analyze how different variables can influence the income distribution.

Thank you for listening!