Ice-cream Shop Waiting Time Simulation

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Background

- Mom&pop shop
- One day in summer in Chicago
- Motivation: Minimize waiting time by hiring what level of experience employee is better? Estimate how much ice cream liquid to be prepared for one day?
- Simulation
  - Average waiting time(ordering + icecream ready) for each customer over each day with different random variables
  - Number of ice-cream units (S – 1 unit, M – 1.5 units, L – 2 units) sold for one day

Random Variables

- Customer: Number of ice-cream for each type ordered by customers
- Customer: Ordering time
- Customer: Thinking time
- Employee: Preparation time based on various levels of experience
- Number of customers comes to the shop in different time during a day
- Number of (experienced & new) chefs available

Strategies

- 2 queues for simulation

New customer arrives

Ordering queue

Customer joins 1st queue & waits for his turn to make an order

Icecream waiting queue

Icecream is added into 2nd queue & waits for the 'Chef' to make it.

Order completed

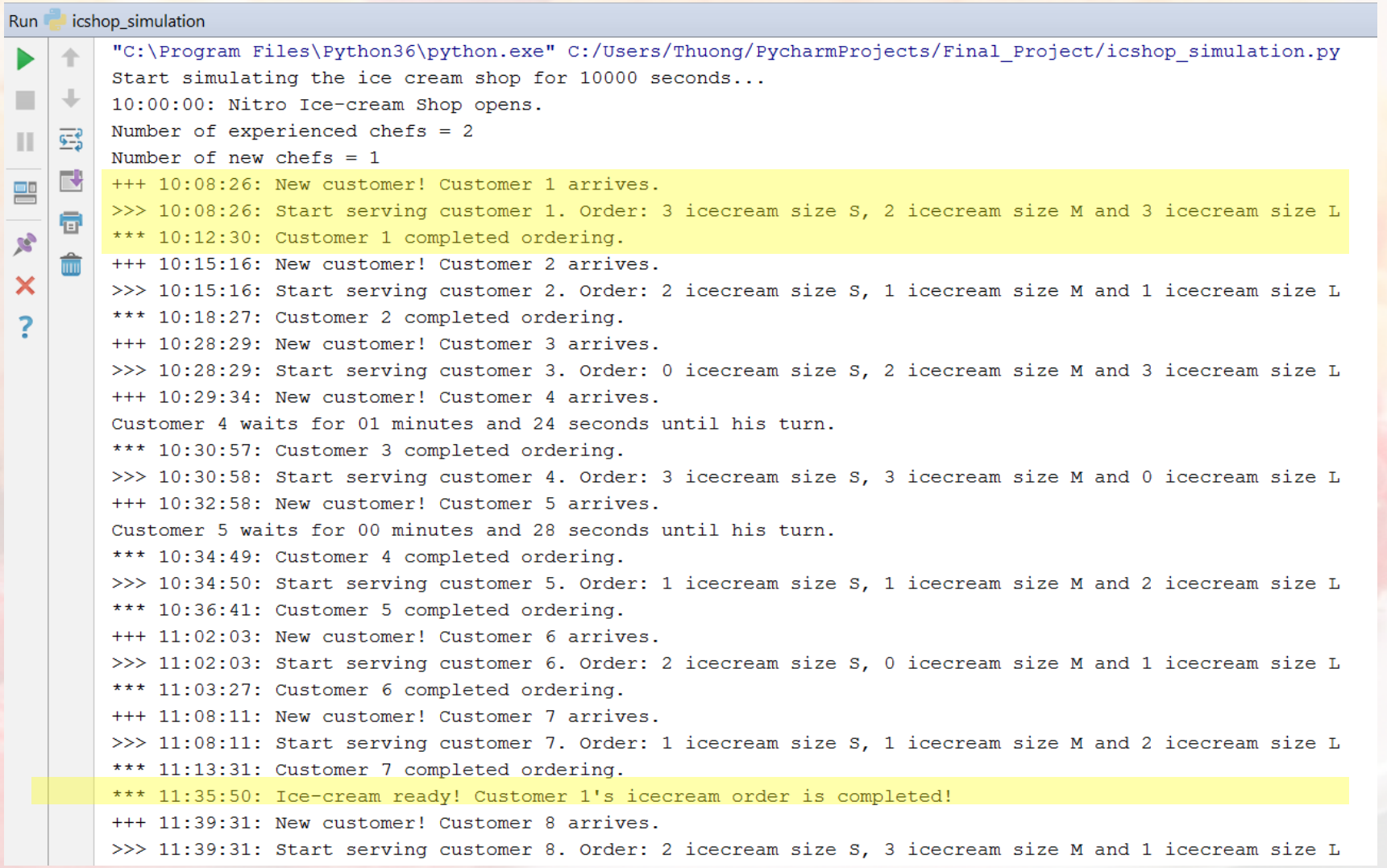
Results

- What we got so far
- Next steps:

Customer arrival distribution

Ice-cream waiting queue: *multi-chefs scenario*

Statistical analysis



Improvement

- Visualization of simulation
- Time: one day -> summer -> year
- Optimize waiting time -> optimize profit