

CS480 – Project Phase 1

Assigned on: Friday, 10/9/2015

Due: Sunday, 10/25/2015, 11:59pm

Please submit your solutions through black board assignment page.

Description

You are introduced an electronic product that has a $\$value$ and a $\$price$. Each product can be in an *Excellent* condition, which works flawlessly, or in a *Trash* condition, where, hmm, it is trash. If you buy a product and if it is *Excellent*, your wealth increases by $\$value - \$price$. If, however, the product turns out to be *Trash*, your wealth decreases by $\$price$. You do not know whether a product is *Excellent* or *Trash* until you buy it; however, there will be clues for you to make an informed decision. Your objective is to increase your wealth as much as possible.

The project will consist of multiple phases. The number of phases is tentatively set to 4. Depending on time and interest, we might need to eliminate one of the existing phases or add a new phase.

According to the syllabus (<http://www.cs.iit.edu/~mbilgic/classes/fall15/cs480/CS480-FALL15-SYLLABUS.pdf>), the project is worth 20% of the grade.

Important: the project is different from homeworks and programming exercises. The homeworks and programming are based on what is already covered in the lectures. The project, however, is not based on past materials in class; instead, it requires you to do research and innovative thinking. Therefore, you need to start each phase of the project as soon as it is assigned.

Phase 1

In this phase, in addition to a product's *\$value* and *\$price*, you are also provided the probability that the product is in *Excellent* condition. Given a product's *\$value*, *\$price*, and probability of being *Excellent*, you are asked to decide whether you want to buy the product or not. You need to implement a method whose arguments are *\$value*, *\$price*, and probability of being *Excellent*. The method should return *True* if your agent wants to buy the product, or *False* otherwise. You are provided two files.

- `agents.py`
 - This file has the base agent `Agent` and a few example agents.
- `simulate_agents_phase1.py`
 - This file simulates a market where agents are presented products.

Your task is to create an agent called `Agent_<hawk_username>` where `<hawk_username>` is, well, your Hawk username. Specifically:

1. Create an `agent_<hawk_username>.py` file.
2. In that file, define an `Agent_<hawk_username>` class, which inherits the base `Agent` class. You should import `Agent` from `agents`; do not copy the `Agent` class code to your `agent_<hawk_username>.py` file! If you are not familiar with classes and inheritance in Python, please see <https://docs.python.org/2/tutorial/classes.html>.
3. Implement the `will_buy` method. See the `agents.py` file for example agents.
4. Your agent should not override the constructor (`__init__` method). We'll run your code with the default constructor of the `Agent` class.
5. In the `simulate_agents_phase1.py` file,
 - a. Line 51: add your agent to the list of other agents.
 - b. Line 56: change seed to the integer part of your CWID.
6. Run the simulation and compare your agent's performance to the performance of other agents.

Submit a zip file that contains two (and only two) files:

1. `agent_<hawk_username>.py` file.
2. A short report in `.txt` format. The report should have:
 - a. A brief description of the `will_buy` strategy.
 - b. The simulation results comparing your agent to the other agents. (This is the output from the `simulate_agents_phase1.py` file after you add your agent to the list and change the seed.) Ideally, your agent should outperform the other agents in all three cases (a fair market, a junk yard market, and a fancy market. See the `simulate_agents_phase1.py` file for more details.)

Please remember to put your files in a folder, zip it, and submit it.