

SchoolNova Computer Science 202
Homework 28
Due 5/15/2021 on Google Classroom

Use classwork code to fix any problems that you had with your homework. If you prefer, use the classwork 27 code as the starting point for this homework.

Task 1

Introduce a new class of objects in the electoral model: organizations. An organization also has an ideal, similar to voters. Unlike voters, they also have money that they can use to influence both voters and politicians. Add money as an attribute. Assume that each new organization starts with 1000 monetary units.

Task 2

Add a method to the organization class: An organization spends 1 monetary unit and a random voter changes his/her ideal to a new value equal to the organization's ideal.

Task 3

Add a method to the organization class: An organization spends 20 monetary units and both politicians adopt policies 50% closer to the organization's ideal point. (For example, imagine the politicians' policies are 0.1 and 0.9. If the organization has an ideal at 0.7, the politicians offer new policies 0.4 and 0.8 respectively).

Task 4

Examine a world with $T = 100$, $N = 1000$ and two organizations: one organization only uses the method from Task 2; the other organization only uses the method from Task 3.

Both organizations have 1000 monetary units and the amount is not replenished: if an organization runs out of money, it cannot do anything else for the rest of time. Assume that each organization can spend only 20 units per time period. (Thus, both organization will run out of money by $T = 50$).

Task 5

Add another attribute to the organization object: utility. Utility is defined as negative distance between the organization's ideal and the policy of the winning candidate:

Utility = $-\text{abs}(\text{organization.ideal} - \text{winner.policy})$.

Create a method that calculates utility for the organization.

Task 6

Which organization is more successful: the one that influences the voters or the one that influences the politicians? Can you plot the utilities of both organizations to support your answer?

Create Figure 1 showing the candidates' policies.

Create Figure 2 showing the organizations' utilities.