ASSIGNMENT 2 REPORT

FOP1005-FUNDAMENTALS OF PROGRAMMING

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- ***ABSTRACT***

The program which is store in **"Animation.py**" python file represents the formed to simulate the stunning dynamics of interactions between humans and vampires, and objects on a 2D map . From, here we also get a bit of knowledge of the dynamics of these interactions, including how the creature interacts, health modifies, and random movement influence them using this Program, which is the project's primary objective. Scatter plots are used to display the program's output, which was constructed in Python and according to object-oriented principles. However, this report covers the program's details, methodology, and results and makes proposals for additional investigation.

- ***BACKGROUND AND INFORMATION***

"**Animation.py"** is the coding source where you will get the information on how Human beings, vampires, and various objects interact in a virtual setting. Again, the program is set out to find how Humans and vampires proceed across the grid and what impact their chaotic movements have on their locations? How do substances like food, water, and garlic impact the interactions and health of the human as vampire is not interacting with the objects. Only humans are interacting with the mentioned items. How do interactions between vampires and humans effect every group's health benefits? To answer such kind of queries, the program was made by animating the interactions and observing the dynamics across a predetermined amount of time steps. By following all the steps, we will able to discover the behind operating story of it.

- ***METHODOLOGY***

To work with this code, we used **"PYTHON**" programming language and to created 3 **classes "Human" , "Vampire" , "Item**(Food, Water, Garlic,) to represent our task, we also created for "Human class" age, health attributes whereas "vampire " class have only age attribute. We have also initialized the specific value for each attribute. By importing "Random" packages for initializing the random numbers of the attributes and define a map size for plotting (map_width, map_height) . We also created functions for the each of the actions which helps for the vitalization the animation. **"Movement"** function is allowed for the human and vampire to move randomly but in the grid. "**Interactions_of_performance** " function is defined for the interacting with human, vampire and item with human. The health of human and vampire may be affected by the interaction with the objects and each other. In order to virtualize the animation we have created a function **"Virtualize_simualtion"** ,for that we are using scatter plot packages which is inside the Matplotlib plot package .The scatter plot shows the position of human, vampire, item(Food, Water, garlic) on the map at each time step. Furthermore, to make the plot more attractive and organize, we used different types of color, size variation, labeling, marker. We also titled the plot name, and also label X- axis, Y- axis with identical name. The timestep for the simulation is 20 which means, it will show us the interaction for the 20 times. Moreover, the simulation data of initial and final counts of humans and vampires will be saved in a CSV file **("simulation_data_.csv")** for a better analysis and reviewing the data. In this assignment 2 part we are instructed to do a bash script parameter swept, for that I have imported sys , os packages .

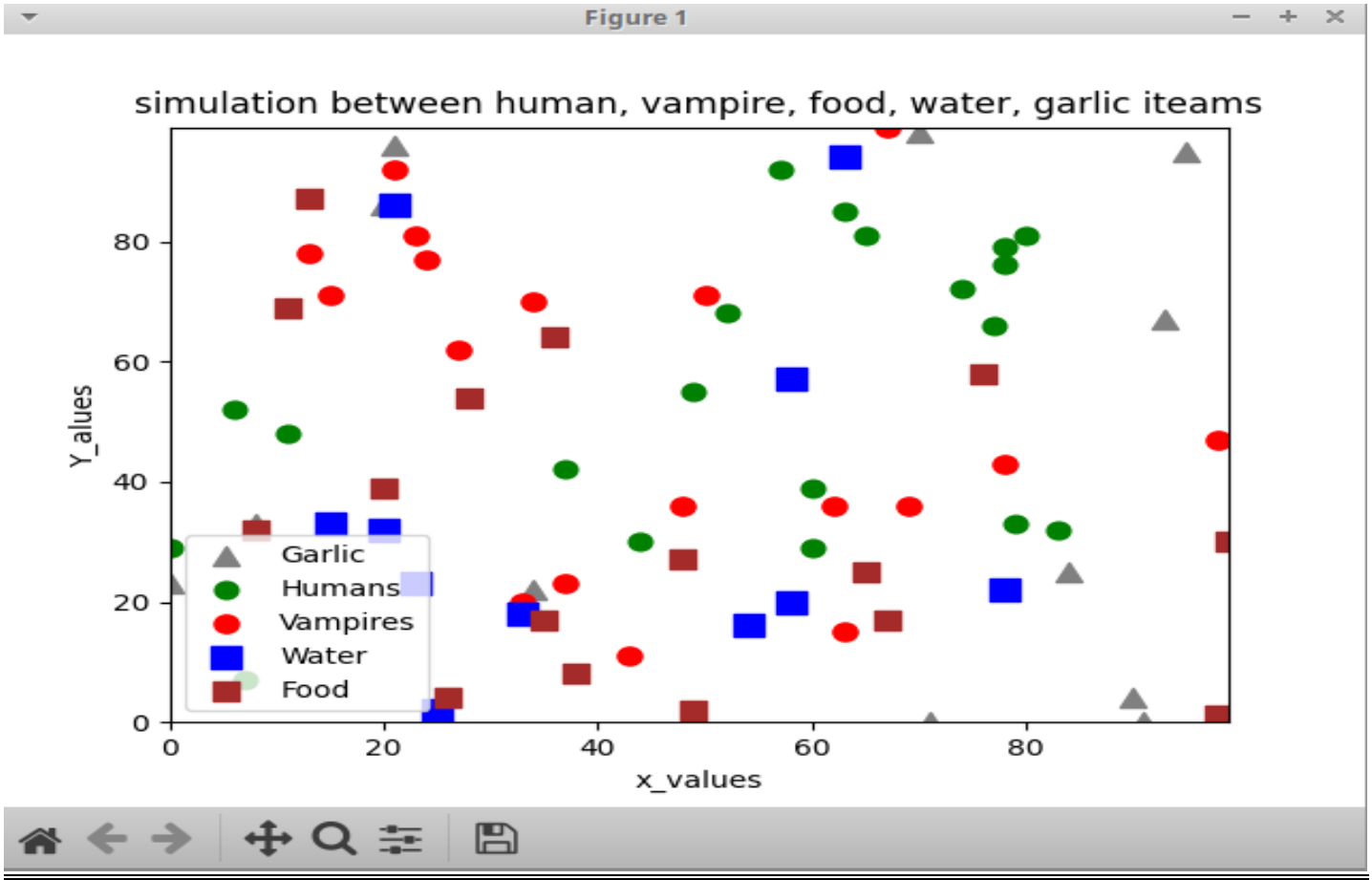
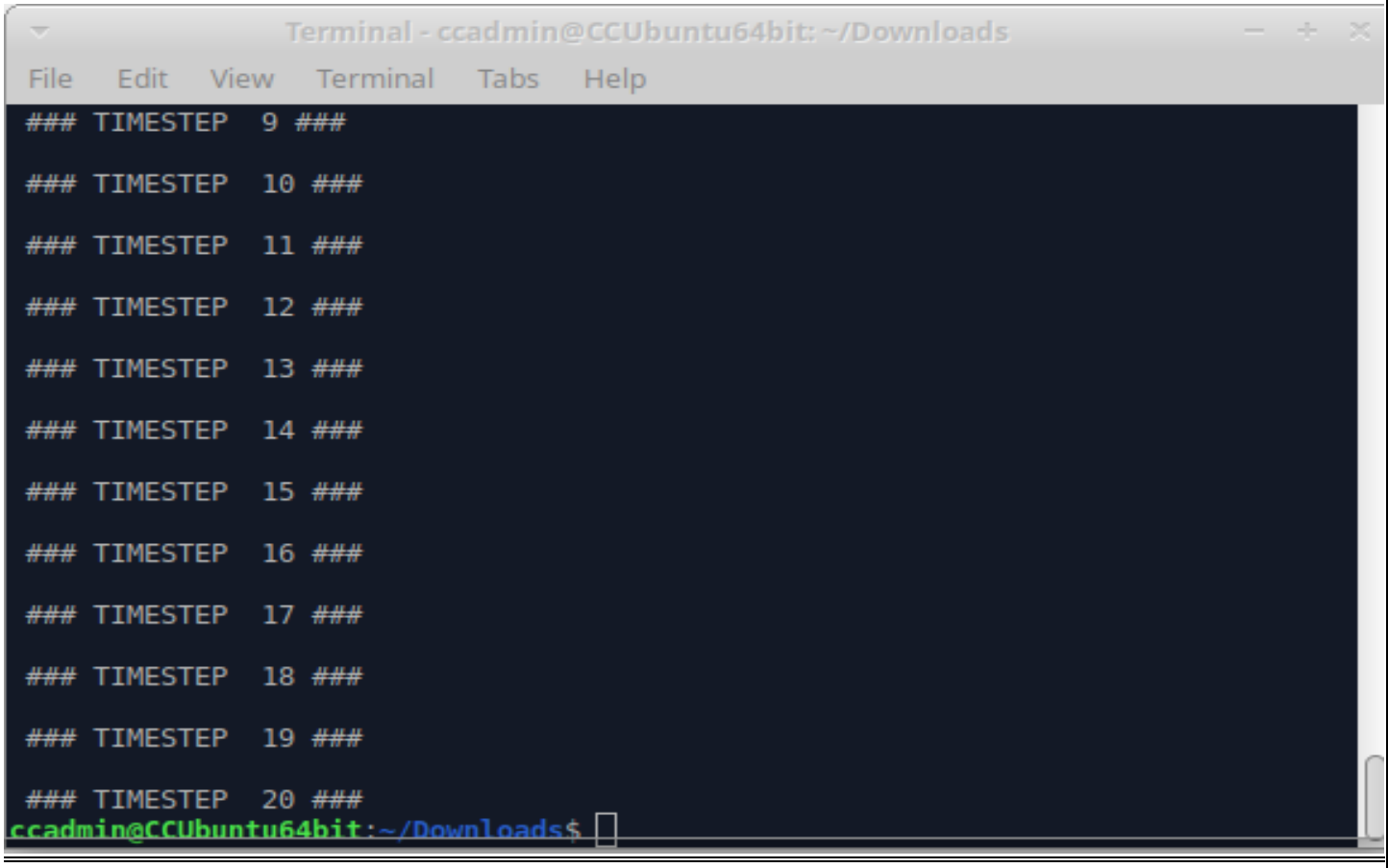


Figure 1
simulation between human, vampire, food, water, garlic iteams
Y_alues
x_values
0
20
40
60
80
Garlic
Humans
Vampires
Water
Food


Terminal - ccadmin@CCUbuntu64bit: ~/Downloads
File Edit View Terminal Tabs Help
TIMESTEP 9
TIMESTEP 10
TIMESTEP 11
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TIMESTEP 14
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ccadmin@CCUbuntu64bit:~/Downloads$

- ***RESULTS***

Scatter plots provided a clear picture of the locations of people, vampires, and environmental factors at various timescale. By labeling each item for the plotting section, easier to recognize each group specifically and their actions and also can avoid any kind of error. The result of the simulation revealed the random movement of human and vampire in the grid in various position. Also, from the vitalization we can notice the interacting between the Vampire and Human, items like Food, Water, Garlic, affecting their heaths. The plots gave us a short description of the stimulation in a very clear and proper manner as we have followed every requirement.

- ***CONCLUSIONS AND FUTURE WORK***

In conclusion, it can be said that, the code is working successfully and provide us a glimpse of the interaction between the Humans, Vampires and the items. Besides that, for the experiments and research, it also gives a better understanding of this complex dynamics. In the future work we can say that, we can include more or investigate more complex items, functions and many more things. By making it more attractive and organize we can set the vitalization understandable. We can also make some changes in by putting our effort in coding part.

- ***REFERENCES***

To implementing it, I took help from lecture slides, online source such as YouTube videos, websites page and so on.