Homework assignment 5

1. Scan the QR code on the screen from the presentation slides to go to the GitHub Repo for the assignment.
2. Alternatively, you can also go directly to this link: https://github.com/abhishekphadke/dijkstras-algorithm/tree/main
3. This will take you to the GitHub repository without having to scan the code.

4. Download the entire repository and uncompress it. You will need a tool like 7ZIP or WinRAR. Both these tools are free. Do not pay to use these tools.

5. You can also clone the repository directly to your IDE if you know how to do so. Either way will work.
6. Go to the worksheet folder and see **Graph 2**.
7. Modify the Dijkstra's code that you have been given in the folder called "1 Presentation code" The code file is called "**code.py**" This file is already able to solve the graph that we solved in class.
8. Your job is to modify the example code, so that it solves Graph 2 in the worksheet. Hint: you do not need to know advanced python to complete this portion of the assignment.
9. You are required to find:

   1) Minimum cost path from A to H
   2) Minimum distance from A to all other nodes
   3) Take screenshots of these answers when your code executes. I will also need your modified python code.

10. Next, carefully study the "**3 interactive example"** folder. Run the code and a dialog box will appear with a graph. Click and select ANY two nodes and the code will show you the shortest path between the two nodes. Use this example to better understand Dijkstra's algorithm.

11. Next step, open and run the code FILE in the **interactive challenge** folder.
12. Once you run the code, a graph will be generated, and it will give you a problem statement in the terminal. Select the source and destination node that the problem specifies in the terminal. For example, if the problem says "Find the shortest path between A and G" then select A and G. It will give you the total for the shortest path.
13. Once you do this step, it will ask you to input the nodes in the GUI window terminal one by one. Entering it might be case sensitive. Enter nodes in uppercase. Trace the shortest path and put the Dijkstra's route in the terminal.
14. If you put all nodes correctly, it will give you a message that says "Congratulations, you followed the correct path!"
15. Take **screenshots** of the graph that you have been assigned, the challenge question in the terminal and also the message "Congratulations, you followed the correct path!".
16. You are required to do this step 3 times. I.e. generate three unique graphs and find the solution three times.

This assignment has been tested by multiple students in previous class/previous semesters without any issues and runs well on both Windows and MacOS. I have designed the assignment such that no complicated setup is required to run the assignment. A simple IDE or even your terminal will work. I would recommend you use visual studio code or pycharm.

What to submit

Create a word document with the following information:

1. A screenshot of your python code output in the terminal or IDE for **code.py. The output should answer the following questions:**
    - What is the minimum cost path from A to H?
    - What is the minimum distance from A to all other nodes?
2. Also put the answer in words for the following questions
    - What is the minimum cost path from A to H?
    - What is the minimum distance from A to all other nodes?
3. The modified code from code.py activity as a .py file.
4. Next, proceed to do the steps from 8 to 12 given above. Take screenshots of the 1) Graph problem that you are assigned, the graph question, and the "Congratulations message" Important:

    You are required to do this THREE times i.e for 3 unique problems.
5. Put all the screenshots in a word document and upload them along with your ".py" python code file. Make sure you conver the word document to a pdf.

Grading rubric

Successfully modify code.py to run Graph 2 and **show me code.py file** by uploading it	5
Put screenshots of code.py output for minimum cost path from A to H and minimum distance from A to all other nodes [for graph 2 in the worksheet]	5
Successfully run the **Interactive challenge** and show screenshots of the problem question and the graph that you get by doing the same activity three times.	5
Show the "congratulations" message in the terminal that indicates you have completed the interactive challenge.	5

Helpful hints

1. The code.py requires minimum modifications to do steps 1 and 2. You just need to find and modify the right section.
2. The interactive challenge question will give you a graph. You can reuse my code.py file and modify it to provide you with the solution. Alternatively, you may also write your own python code or choose to do it on paper. **There are some ways to do this assignment without any effort at all. Think smart!**
3. This is a networking class and not a programming class. Therefore, my assignments never involve significant coding. None of the above questions require you to have an expertise in python. Whatever you learn in a 150-level class at CNU should suffice.