EGR 115 – Final Project Proposal

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1. **What is your project topic?**

   Shortest Path through nodes.

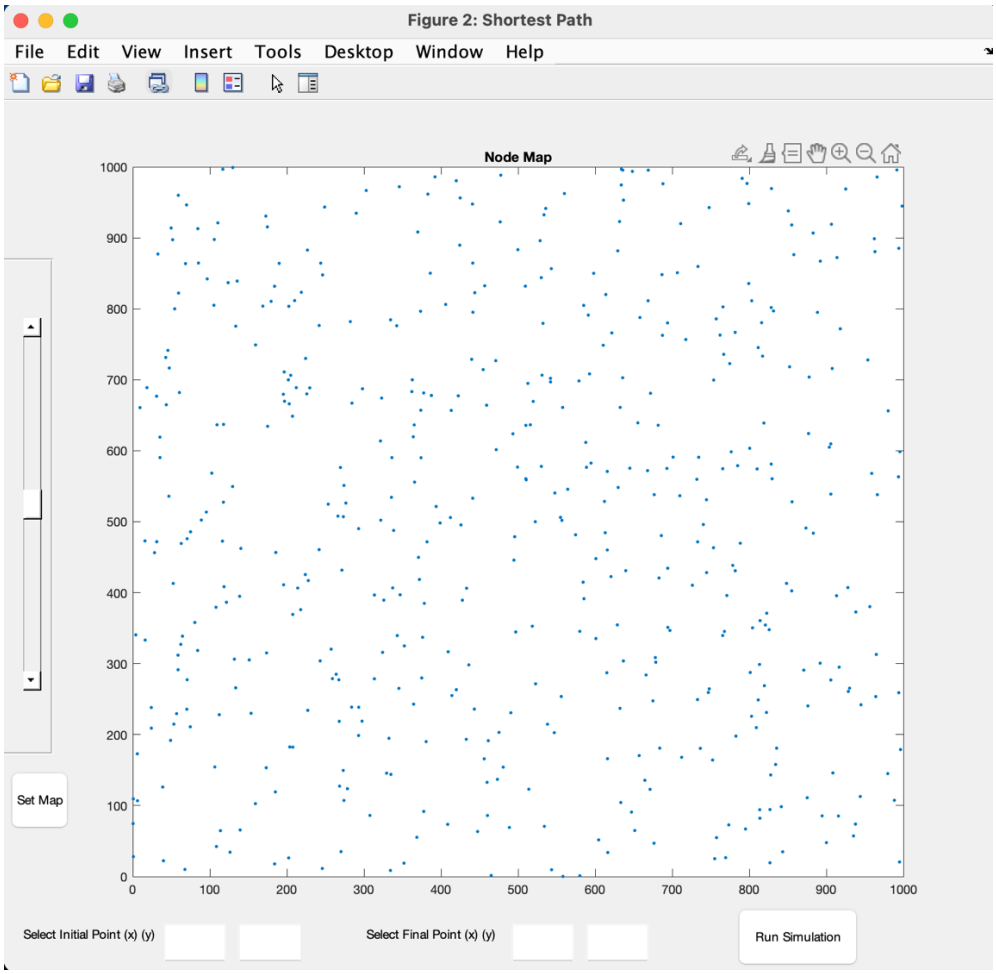
2. **Categorize what type of project you are completing.**

   a. Scientific topic **b.** Extensible Database Management System **c.** Applied Database
   d. Game **e.** Other

3. **Describe your project.**

   Write a short explanation of the purpose and function of your project. Also, write a sentence about why you are selecting this project. With a few paragraphs, describe your project with necessary details. For example, explain the rules of the game; or explain properties and functionalities of the database. Include pictures, charts, and/or equations that help explain your idea

- This project takes input through a GUI to select two nodes. (An origin and a destination). The shortest path is then calculated through the nodes and a visualization is outputted.



Shown above is the first draft of the project. A slider will be located on the left hand side of the GUI where the user will be able to adjust the map density (the number of nodes shown). At the bottom of the GUI will be text input fields in which the user will type in an initial point and an endpoint. They will then press the GUI pushbutton to start which will change the dot graph shown to a graph with a line through showing the shortest path through the nodes.

4. **Consider all the programming techniques required in your code – reflect on how you will include these in your code.** *You do not need to submit anything for this question.*

INPUTS:
User inputs/interface (e.g., input, dialog boxes, GUI)
File input (e.g., xlsread, dlmread, getcsv)
Random numbers (e.g., rand, randi)
DATA TYPES:
Numeric data and strings
Arrays (i.e., vectors, matrices, cell arrays)
DATA PROCESSING:
Rounding (i.e., round, ceil, floor)

Counting/calculating (e.g., running total, sum, mean, multiplication)
Organizing/analyzing (e.g., sorting, searching)
Array manipulation (i.e., referencing, slicing, augmenting, and diminution)
LOGIC:
Conditions (i.e., relational operators and Boolean operators)
Conditionals (i.e., if statement, switch/case)
Loops (i.e., while loop, for loop)
Nesting (loops and conditionals)
Error checking (all inputs appropriately error checked)
Programmer-defined functions (input parameters and return values)
String functions (e.g., sprintf, strcat, strfind, strcmp)
Other built-in function not discussed in class
OUTPUTS/DISPLAY:
Display relevant outputs to user/interface (e.g., fprintf, dialog boxes, GUI)
File output (e.g., xlsread, dlmread, putcsv)
Plotting (with appropriate data, formatting, and labeling)

5. **Based on your reflections for question 4, answer the following questions in 2 – 3 sentences or bullet points.** *You may not have covered all of these topics up to this point, so refer to the descriptions in the full project proposal document.*

    a. **How do you think you will use arrays in your project?**
    For the generation of maps
    the storing and manipulation of distance data

    b. **How do you think you will use strings in your project?**

    GUI input text

    Output description

    c. **How do you think you will use programmer-defined functions in your project?**

    Callbacks for GUI elements
    Reusable functions for repeated tasks such as filtering data.

    d. **How do you think you will use data file reading (dlmread or xlsread) and/or data file writing (dlmwrite or xlswrite) in your project?**

    Output of map to excel sheet

    Output of distance values to excel sheet

6. **How will your user interact with your program?**

    Note: You may select dialog boxes and GUIs, but you may not select command window and dialog boxes or GUIs.

a. Command Window **b.** Dialog Boxes **c.** Graphical-User Interfaces (GUIs)

7. **Using inappropriate programming techniques will result in deductions in your final project grade.** Read the section of "Inappropriate code/techniques" in "Project Description" and list the items that you have heard or used before. Remember, these techniques are not to be used in EGR 115.