

## CIS7 Project Documentation Guide

1. Team name: Gungnir

Members: Kevin Ramirez

2. Project Information and details:

- What problems are you solving in this project?

In this project, I am aiming to create a program to plan trips effectively for a solar marketing specialist. The program is designed for the user to choose a route to see the distance from one destination to another in the Inland Empire.

- What solutions are you implementing in the project?

I implemented functions to decrease the amount of time for the program to run. The functions are designed to find possible routes and display them on screen. I also included an adjacency list to hold information about the cities located in the Inland Empire. I couldn't make a function to determine the most effective route, so I did the calculation on hand and displayed it when selecting option 2. The map shows all routes and includes the distance between each cities.

- Provide explanation of calculations and algorithm implementation.

I used struct Edge to hold data of each cities (edges) and pass the data to the graph class in order to print it using printList function. The shortest round trips were displayed by using an adjacency list. The function for the adjacency list stores the number from three adjacent cities and passes it through the array. The map was made by using a matrix to show the relationship of the edges and the distance of the edges. This data was passed on to another printList function to display it for user and programmer.

- What is the program objectives? Explain how your program is interacting with the user and its purpose.

The program is designed to display the 4 cities for the marketing specialist to view all possible routes in the Inland Empire. It shows a round trip, shortest possible route, and effective route to arrive to a city. Program is easy to use as the user needs to input a number to display the cities.

- How is discrete structures implemented in the C++ program?

By using adjacency list and adjacency matrix, I am able to display different variations of graphing structures that I learned in this course. The variations that the program uses help determine the arrays for possible routes from one edge to another.

- What are the limitations of the program?

This program is only designed for the locations provided in the Inland Empire. There is no input area to design a new location. Other than that, the display for the output is still flawed as it only displays basic possible paths as it shows all paths rather than from one location to another.

- Provide recommendation on improving the limitations of the program.

I believe using more classes to store data of new cities from user's input would help greatly expand the limitations of the program. Also by expanding the functions to

display from one city to another with possible paths and most efficient paths can help show more of a visual detail to the user.

3. Flowchart OR Pseudocode. (30 points)

- Write the pseudocode for the program, from start to finish. Be sure to include decision-making branching.
- If you choose to do flowchart, use standard shapes for flowchart, be sure to include decision-making branching. You can use web-based tool such as Draw.io to build your flowchart.

