# University of Ghana

Department of Computer Science

# DCIT204: Data Structures and Algorithm 1

# Project Report

**Project Summary**

Write the title of the project, your ID numbers, and your names on the first page of the report (Cover Page). Provide the role of each member of the group and state clearly their contribution. An optional abstract can be added.

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| --- | --- | --- | --- | --- |
| **Name** | **ID** | **Role** | **Activities Performed** | **Percentage contribution** |
| Francis Echesi | 10848346 | Team Captain | General group coordination and lead algorithm tester. | 20% |
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Groups should provide a summary of the project description

Our project is one that helps in solving transportation problem by finding all possible paths from a user-defined source to a destination and selecting the most optimal path or route based on both distance and time needed to complete each path.

Describe the objectives achieved by the group

We have been able to obtain distances between various points on UG campus and travel time between them and have created graph data structures with these values. These graphs is now manipulated to get all paths between two point and optimal path between those points.

Describe the key features of the system developed

The system will have a UI that will prompt the user to enter the source and destination. The algorithms will be used to compute all paths and optimum paths and displayed to the user as well as the shortest time for the optimum distance.

Describe the algorithms used and how you integrated these algorithms in your project

In searching for all routes between two points, a modified Depth-First Search was used on the graph which produced all the paths. Then, Vogel’s Approximation was used to compute the shortest distance between the points. North-West Corner Method was then used to compute the shortest time for the optimum distance.

Describe you have learnt

As a group, we have gained a deeper understanding of data structures and algorithms in general and how to create, modify and use many complex algorithms

Describe the Project development process

In the first week of the project, we worked on generally understanding the project requirements and gathering enough knowledge since not all of us were experienced with algorithms from the beginning.

In the second and third weeks, we worked on gathering the data needed for the project and creating the necessary algorithms as fully functional standalone Java apps and thoroughly testing them

In the fourth week, we worked on integrating the algorithms and binding the data values gathered to the algorithms.

Provide the User interface

[Image File Here]

Describe your challenges if any

We had some trouble with collaboration and communication as a group because we all had different timetables and schedules. But we found a way around that and figured out how to maximize one another’s expertise to make full use of everyone