Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
Semester: 4th (Spring, Year: 2023), B.Sc. in CSE (Day)

Efficient Pathfinding using Dijkstra's Algorithm: Visualizing the Shortest Route between Two Points

Lab Project Proposal

Course Title: Object Oriented Programming Lab
Course Code: CSE 202 / Section: DI

<u>Students Details</u>

Name	ID
KHONDOKAR SAIM	221902353

Submission Date: 24 /03/2023
Course Teacher's Name: Md. Parvez Hossain

[For teachers use only: Don't write anything inside this box]

1. TITLE OF THE PROJECT PROPOSAL

The project titled "Efficient Pathfinding using Dijkstra's Algorithm: Visualizing the Shortest Route between Two Points" focuses on implementing Dijkstra's algorithm for efficient pathfinding and creating a visual representation of the shortest route between two points. By combining the power of Dijkstra's algorithm and visualization techniques, the project aims to offer an efficient and intuitive way to find the shortest route between two points, providing a practical solution for various applications like navigation systems, logistics planning, and network routing.

2. PROBLEM DOMAIN & MOTIVATIONS

Problem Domain :
Visualizing the Shortest Route between Two Points" lies in finding the most efficient path between two points in a given graph or network. Pathfinding is a fundamental problem in computer science and has various real-world applications. In many scenarios, such as navigation systems, logistics planning, and network routing, finding the shortest route between two points is essential. However, determining this path can be challenging when dealing with complex networks, large datasets, or graphs with weighted edges. Overall, the project's problem domain revolves around optimizing pathfinding using Dijkstra's algorithm and providing a visual representation of the shortest route, making it applicable in domains where efficient navigation or resource allocation is crucial.

Motivations :
The motivation behind the project is to enhance the efficiency of Dijkstra's algorithm for pathfinding and provide a visually intuitive representation of the shortest route. This improvement can benefit various applications, offering faster and more reliable navigation, logistics planning, and network routing solutions.

3. OBJECTIVES/AIMS

The objectives/aims of the project include optimizing Dijkstra's algorithm for :
- Efficient pathfinding
- Ensuring accuracy and scalability
- Visualizing the shortest route
- Creating a user-friendly interface
- Providing comprehensive documentation and communication of the project's capabilities.

4. TOOLS & TECHNOLOGIES

The implementation of the algorithm and visualization can be done using java Programming Language. Because this language offer extensive libraries and frameworks for graph manipulation, data structures, and user interface development. For helps in coding, debugging, and managing the project effectively we are going to use Apache NetBeans 17 IDE.