**Assignment- 4 Dijkstra's Algorithm**

**Sajid Iqbal Ishaq Mohammed**

Concordia University

November 16, 2022

CSC- 543

**Self-Assessment**

**1**. It took me just under a week to complete the assignment.

**2**. I put my entire effort into coding the programs. In this assignment, I will indeed expect an A Grade (100 on 100).

**3**. Every coding solution is correct. As a result, I would anticipate an A grade.

**4**. Learning the fundamentals of C++ produced coding simple. The main issue I encountered was in running the code. As I complete all of the weekly assignments, I am becoming more precise in detecting the errors and executing the program. The overall experience was excellent and will be best.

**Assignment- 4 Dijkstra's Algorithm**

#include <iostream>

#include <limits.h>

#include <list>

#include <queue>

using namespace std;

#define V 9

int minDistance(int dist[], bool sptSet[])

{

int min = INT\_MAX, min\_index;

for (int v = 0; v < V; v++)

if (sptSet[v] == false && dist[v] <= min)

min = dist[v], min\_index = v;

return min\_index;

}

// A utility function to print the constructed distance array

void printSolution(int dist[], int n)

{

printf("Vertex Distance from Source\n");

for (int i = 0; i < V; i++)

printf("%d tt %d\n", i, dist[i]);

}

// Function that implements Dijkstra's single source shortest path algorithm

// for a graph represented using adjacency matrix representation

void dijkstra(int graph[V][V], int src)

{

int dist[V];

bool sptSet[V];

for (int i = 0; i < V; i++)

dist[i] = INT\_MAX, sptSet[i] = false;

dist[src] = 0;

for (int count = 0; count < V - 1; count++) {

int u = minDistance(dist, sptSet);

sptSet[u] = true;

for (int v = 0; v < V; v++)

if (!sptSet[v] && graph[u][v] && dist[u] != INT\_MAX

&& dist[u] + graph[u][v] < dist[v])

dist[v] = dist[u] + graph[u][v];

}

printSolution(dist, V);

}

int main()

{

int graph[V][V] = { { 0, 4, 0, 0, 0, 0, 0, 8, 0 },

{ 4, 0, 8, 0, 0, 0, 0, 11, 0 },

{ 0, 8, 0, 7, 0, 4, 0, 0, 2 },

{ 0, 0, 7, 0, 9, 14, 0, 0, 0 },

{ 0, 0, 0, 9, 0, 10, 0, 0, 0 },

{ 0, 0, 4, 14, 10, 0, 2, 0, 0 },

{ 0, 0, 0, 0, 0, 2, 0, 1, 6 },

{ 8, 11, 0, 0, 0, 0, 1, 0, 7 },

{ 0, 0, 2, 0, 0, 0, 6, 7, 0 } };

dijkstra(graph, 0);

return 0;

}

**Link to my GitHub repository:**

<https://github.com/Ishaq97-lang/mywork>