**Dijkstra's Algorithm**

**Bahadur Khan**

Concordia University

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**Self-Assessment**

1. I finished the job in a little more than a week. I put all my work into programming the programs.
2. I'll be looking for an A on this project. Each coding solution is correct. So, I anticipate receiving an A.
3. So, I anticipate receiving an A. Coding became simple after learning the basics of C++.
4. As when I tried to run the code. As I do each of the weekly assignments, I get better at seeing mistakes and running the software. The general knowledge was quite good.

**Dijkstra's Algorithm**

**An example of 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;

}

**GitHub repository Link**

<https://github.com/Bahadurk/12lang.git>