11/7/24

Dijkstras

```
#include<stdio.h>

#define INF 9999
#define N 6

void dijkstra(int cost[N][N], int src){
    int dist[N];
    int vis[N];
    int count, min_dist, u;

    for(int i=0; i<N; i++){
        dist[i]=INF;
        vis[i]=0;
    }

    dist[src]=0;

    for(count=0; count<N-1; count++){
        min_dist=INF;
        for(int v=0; v<N; v++){
            if(!vis[v] && dist[v]<=min_dist){
                min_dist=dist[v];
                u=v;
            }
        }

        vis[u]=1;

        for(int v=0; v<N; v++){
            if(!vis[v] && cost[u][v] && dist[u]!=INF && dist[u]+cost[u][v]<dist[v])
                dist[v]=dist[u]+cost[u][v];
        }
    }
```

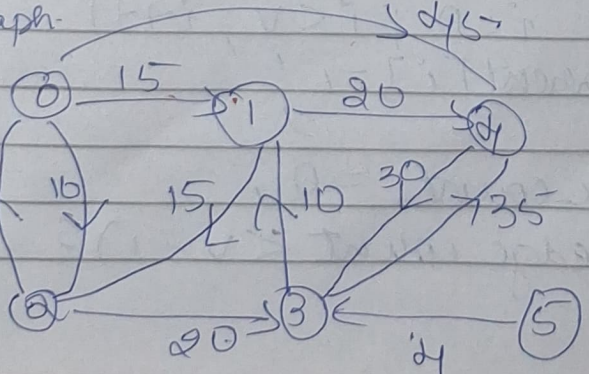
```
    printf("Vertex \t\t Distance from Source\n");
    for(int i=0; i<N; i++){
        printf("%d \t\t %d\n", i, dist[i]);
    }
}

int main(){
    int cost[N][N] = {
    {0, 15, 10, INF, 45, INF},
    {INF, 0, 15, INF, 20, INF},
    {20, INF, 0, 20, INF, INF},
    {INF, 10, INF, 0, 35, INF},
    {INF, INF, INF, 30, 0, INF},
    {INF, INF, INF, 4, INF, 0}
    };
    int src = 5;
    dijkstra(cost, src);
    return 0;
}
```

Output

Vertex	Distance from Source
0	24
1	19
2	24
3	4
4	34
5	0

Graph



Kruskals

```
#include <stdio.h>
#include <stdlib.h>
#include <stdbool.h>,
#define V 5

int parent[V];

int find(int i)
{
    while (parent[i] != i)
        i = parent[i];
    return i;
}

void union1(int i, int j)
{
    int a = find(i);
    int b = find(j);
    parent[a] = b;
}

void kruskalMST(int cost[][V])
{
    int mincost = 0;

    for(int i=0; i<V; i++)
        parent[i] = i;

    int edge_count = 0;
    while(edge_count < V-1){
```

DATE: / /
PAGE NO: Usha Gold

```
int min = INT_MAX, a = -1, b = -1;
for(int i = 0; i < V; i++){
    for(int j = 0; j < V; j++){
        if(find(i) != find(j) && cost[i][j] < min){
            min = cost[i][j];
            a = i;
            b = j;
        }}}
union(a, b);
printf("Edge %d: (%d, %d) cost: %d\n",
        edge_count++, a, b, min);
mincost += min;
}
printf("\n Minimum cost = %d\n", mincost);
}

int main()
{
    int cost[][V] = {
        { INT_MAX, 8, INT_MAX, 6, INT_MAX},
        {8, INT_MAX, 3, 8, 5},
        {INT_MAX, 3, INT_MAX, INT_MAX, 7},
        {6, 8, INT_MAX, INT_MAX, 9},
        {INT_MAX, 5, 7, 9, INT_MAX},
    };

    kruskalMST(cost);

    return 0;
}
```

11/7/24.

Output

Edge 0: (0, 1) cost: 2
Edge 1: (1, 2) cost: 3
Edge 2: (1, 4) cost: 5
Edge 3: (0, 3) cost: 6