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**ROLL NO. – 1906137**

**SUBJECT NAME – DESIGN AND ANALYSIS OF ALGORITHMS LAB**

**SUBJECT CODE – CSL4403**

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**BRANCH – CSE 2**

**ASSIGNMENT-7**

**Q7. WAP to implement minimum cost MST using Prims Algorithm.**

**Source Code in C++ Language:**

#include <bits/stdc++.h>

using namespace std;

const int N = 100;

int graph[N][N];

int parent[N];

int key[N];

int mst[N];

int minEdge(int n){

int mn = INT\_MAX, u;

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

{

if(!mst[i] && key[i]<mn)

{

mn = key[i];

u = i;

}

}

return u;

}

void prims(int n)

{

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

{

key[i] = INT\_MAX;

mst[i] = false;

}

key[0] = 0;

parent[0] = -1;

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

{

int u = minEdge(n);

mst[u] = true;

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

{

if(graph[u][v] && !mst[v] && graph[u][v] < key[v])

{

key[v] = graph[u][v];

parent[v] = u;

}

}

}

for(int i=n-1; i!=-1; i = parent[i])

{

if(parent[i]!=-1)

cout<<i<<" "<<parent[i]<<endl;

}

int mstTotal=0;

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

mstTotal+=key[i];

cout<<"Minimum cost of of MST ="<<mstTotal<<endl;

}

int main(){

int n;

cout<<"Enter the number of vertices in the graph.\n";

cin>>n;

memset(graph, 0, sizeof(graph));

cout<<"Enter the edges and their respective costs in the form of adjancency matrix.\n";

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

{

for(int j=0; j<n; j++)

cin>>graph[i][j];

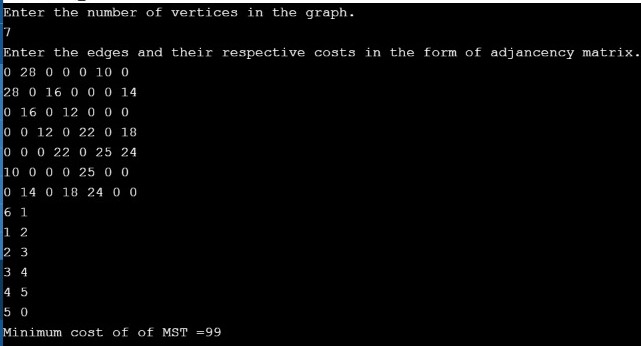
}

prims(n);

return 0;

}

**Output Screenshot:**

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