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Experiment 6

Traveling Salesperson:

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#include<stdio.h>
int DistMat[10][10],visitedCity[10],n,cost=0, InitialVertex = 0;
int main(){
    getDistMat();
    printf("\n\nOptimal Path is:--> :\n");
    mincost(InitialVertex);
    printf("\n\nMinimum cost is %d\n",cost);
    return 0;}

void getDistMat(){
    int i,j;
    printf("Enter Number of Cities :-->");
    scanf("%d",&n);
    printf("\nEnter the Distance Matrix--> \n");
    for(i=0;i<n;i++){
        printf("\n Enter Distance of Row:%d\n",i+1);
        for (j=0;j<n;j++) {
            scanf("%d",&DistMat[i][j]); }
        visitedCity[i]=0; }
    printf("\n\nCost Matrix :-->");
    for(i=0;i<n;i++) {
        printf("\n");
        for(j=0;j<n;j++) {
            printf("\t%d",DistMat[i][j]);
        } } }

void mincost(int city){
    int i,ncity;
    visitedCity[city]=1;
    printf("%d --> ",city+1);
    ncity = least(city);
    if(ncity==999) {
        ncity=0;
        printf("%d",ncity+1);
        cost +=DistMat[city][ncity];
        return;}
    mincost(ncity);}

int least(int c){
    int i,nc=999;
    int min = 999,kmin;
```

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for(i=0;i<n;i++) {
    if((DistMat[c][i]!=0)&&(visitedCity[i]==0))
        if(DistMat[c][i]+DistMat[i][c]<min) {
            min=DistMat[i][0] + DistMat[c][i];
            kmin=DistMat[c][i];
            nc=i; } }
if(min!=999)
    cost+=kmin;
return nc;
}

```

Output:

Enter Number of Cities :-->3

Enter the Distance Matrix-->

Enter Distance of Row:1

0

15

25

Enter Distance of Row:2

15

0

20

Enter Distance of Row:3

15

25

0

Cost Matrix :-->

0 15 25

15 0 20

15 25 0

Optimal Path is:--> :

1 --> 2 --> 3 --> 1

Minimum cost is 50