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Batch: B3

Practical 7: Design & Implement Travelling salespersons Problem using Dynamic Programming. Also calculate the Time complexity for this algorithm.

Code:

```
#include<stdio.h>
```

```
using namespace std;
```

```
int least(int c);
```

```
int ary[10][10],completed[10],n,cost=0;
```

```
void takeInput()
```

```
{
```

```
    int i,j;
```

```
    printf("Enter the number of villages: ");
```

```
    scanf("%d",&n);
```

```
    printf("\nEnter the Cost Matrix\n");
```

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

```
    {
```

```
        printf("\nEnter Elements of Row: %d\n",i+1);
```

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

```

scanf("%d",&ary[i][j]);

    completed[i]=0;
}

printf("\n\nThe cost list is:");

for( i=0;i < n;i++)
{
    printf("\n");

    for(j=0;j < n;j++)
        printf("\t%d",ary[i][j]);

}
}

void mincost(int city)
{
    int i,ncity;

    completed[city]=1;

    printf("%d--->",city+1);
    ncity=least(city);

    if(ncity==999)
    {
        ncity=0;
        printf("%d",ncity+1);
    }
}

```

```

        cost+=ary[city][ncity];

        return;
    }

    mincost(ncity);
}

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

    for(i=0;i < n;i++)
    {
        if((ary[c][i]!=0)&&(completed[i]==0))
            if(ary[c][i]+ary[i][c] < min)
            {
                min=ary[i][0]+ary[c][i];
                kmin=ary[c][i];
                nc=i;
            }
    }

    if(min!=999)
        cost+=kmin;

    return nc;
}

```

```

int main()
{
    takeInput();

    printf("\n\nThe Path is:\n");

    mincost(0); //passing 0 because starting vertex

    printf("\n\nMinimum cost is %d\n ",cost);

    return 0;
}

```

Output:

```

Select C:\Users\susha\Documents\DAA Lab\Ass7.exe
Enter the number of villages: 3
Enter the Cost Matrix
Enter Elements of Row: 1
2
3
4
Enter Elements of Row: 2
5
5
6
Enter Elements of Row: 3
7
7
8

The cost list is:
      2      3      4
      5      5      6
      7      7      8

The Path is:
1--->2--->3--->1

Minimum cost is 16

-----
Process exited after 9.182 seconds with return value 0
Press any key to continue . . .

```

