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Branch: SE Computers A (Batch A)
Experiment 11: Floyd Warshall

```c
#include<stdio.h>
int min(int,int);
void floyds(int p[10][10],int n) {
    int i,j,k;
    for (k=1;k<=n;k++){
        for (i=1;i<=n;i++){
            for (j=1;j<=n;j++){
                if(i==j)
                    p[i][j]=0;
                else
                    p[i][j]=min(p[i][j],p[i][k]+p[k][j]);
            }
        }
    }
}

int min(int a,int b) {
    if(a<b)
        return(a);
    else
        return(b);
}

void main() {
    int p[10][10],w,n,e,u,v,i,j;
    printf("Enter the number of vertices:");
    scanf("%d",&n);
    printf("Enter the number of edges:\n");
    scanf("%d",&e);
    for (i=1;i<=n;i++) {
        for (j=1;j<=n;j++)
            p[i][j]=999;
    }
    for (i=1;i<=e;i++) {
        printf("Enter the end vertices of edge%d with its weight ",i);
        scanf("%d%d%d",&u,&v,&w);
        p[u][v]=w;
    }
    printf("Matrix of input data:\n");
    for (i=1;i<=n;i++) {
        for (j=1;j<=n;j++)
            printf("%d \t",p[i][j]);
        printf("\n");
    }
    floyds(p,n);
    printf("Transitive closure:\n");
```

```c
        for (i=1;i<=n;i++) {
            for (j=1;j<=n;j++)
                printf("%d \t",p[i][j]);
            printf("\n");
        }
        printf("The shortest paths are:\n");
        for (i=1;i<=n;i++){
            for (j=1;j<=n;j++) {
                if(i!=j)
                    printf("\n <%d,%d>=%d",i,j,p[i][j]);
            }
        }
}
```

Output:

```
C:\Users\dmell\OneDrive\Desktop\Subjects\AOA\FloydWarshall.exe
Enter the number of vertices:4
Enter the number of edges:
7
Enter the end vertices of edge1 with its weight 1 2 3
Enter the end vertices of edge2 with its weight 2 1 8
Enter the end vertices of edge3 with its weight 1 4 7
Enter the end vertices of edge4 with its weight 4 1 2
Enter the end vertices of edge5 with its weight 3 4 1
Enter the end vertices of edge6 with its weight 2 3 2
Enter the end vertices of edge7 with its weight 3 1 5
Matrix of input data:
999      3       999      7
8        999     2        999
5        999     999      1
2        999     999      999
Transitive closure:
0        3       5        6
5        0       2        3
3        6       0        1
2        5       7        0
The shortest paths are:

 <1,2>=3
 <1,3>=5
 <1,4>=6
 <2,1>=5
 <2,3>=2
 <2,4>=3
 <3,1>=3
 <3,2>=6
 <3,4>=1
 <4,1>=2
 <4,2>=5
 <4,3>=7
Process returned 4 (0x4)    execution time : 56.884 s
Press any key to continue.
```