ADA LAB

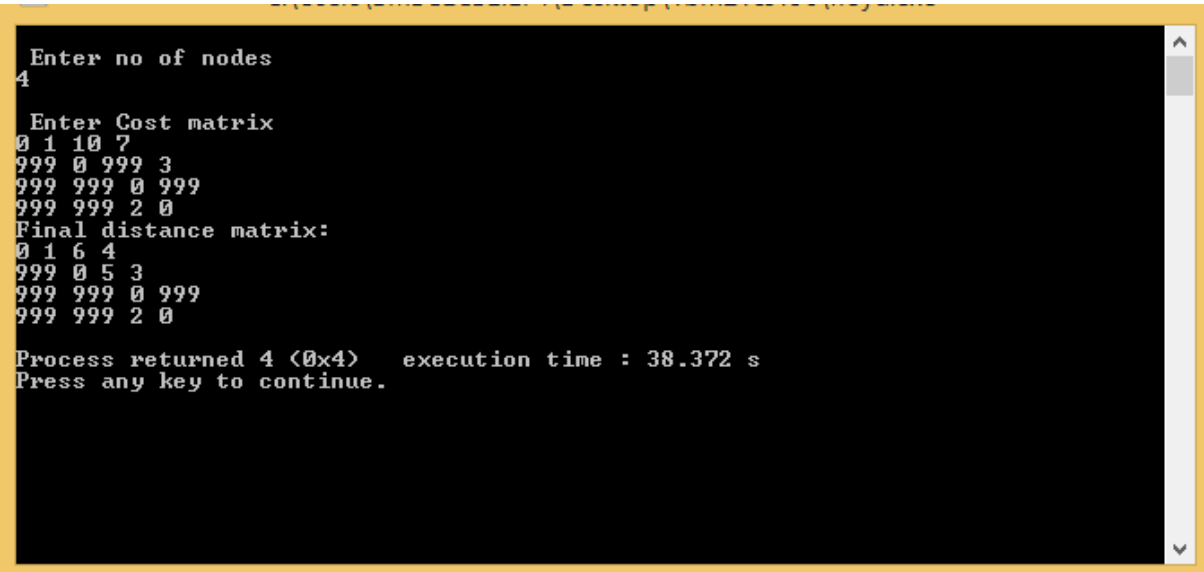
FLOYD'S ALGORITHM:

CODE:

```
#include<stdio.h>


int c[10][10],d[10][10],n;
void floyd(int c[10][10],int d[10][10]);
void main()
{
   printf("\n Enter no of nodes\n");
   scanf("%d",&n);
printf("\n Enter Cost matrix \n");
for(int i=1;i<=n;i++)

 {
    for(int j=1;j<=n;j++)
 {
   scanf("%d",&c[i][j]);
 }//inner for loop

 }//outer for
 floyd(c,d);
}//main
void floyd(int c[10][10],int d[10][10])
{
   for(int i=1;i<=n;i++)

 {
    for(int j=1;j<=n;j++)
 { d[i][j]=c[i][j];
```

```
}
 }
 for(int k=1;k<=n;k++)
 {
    for(int i=1;i<=n;i++)
    {
       for(int j=1;j<=n;j++)
         {d[i][j]=(d[i][j]<d[i][k]+d[k][j])?d[i][j]:(d[i][k]+d[k][j]);


         }
    }
 }
 printf("Final distance matrix: \n");
 for(int i=1;i<=n;i++)

 {
    for(int j=1;j<=n;j++)
{
   printf("%d ",d[i][j]);
 }//inner for loop
 printf("\n");
 }//outer for

}//Floyd
```

OUTPUT:



KNAPSACK ALGORITHM

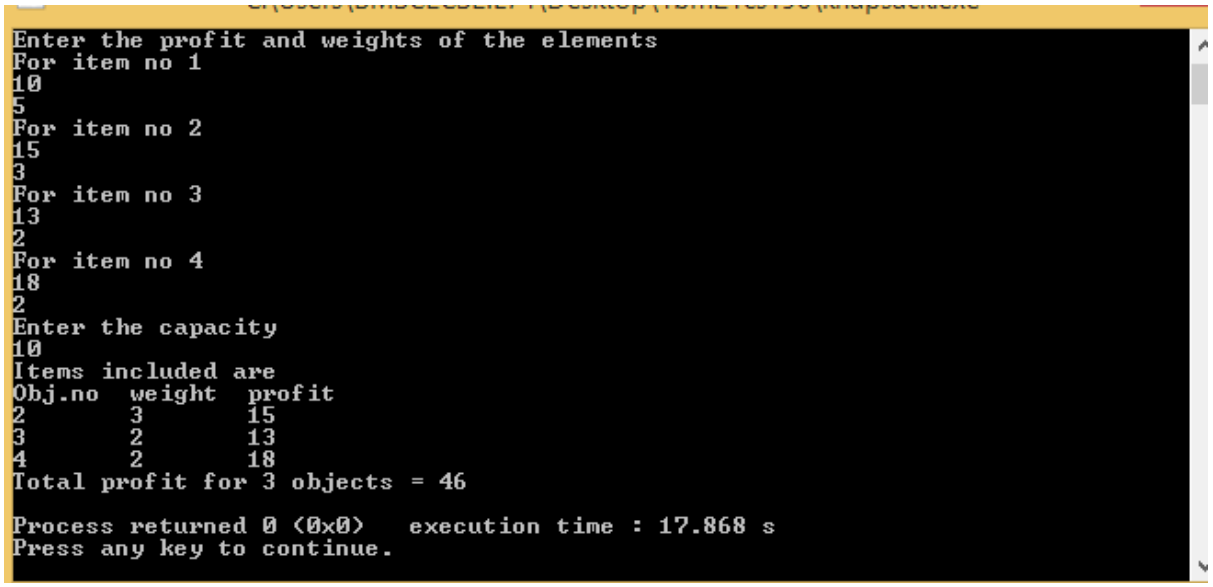
CODE:

```
#include <stdio.h>


#define MAX_ELEMENTS 10


int w[MAX_ELEMENTS], p[MAX_ELEMENTS], v[MAX_ELEMENTS][MAX_ELEMENTS], n, i, j, cap,
x[MAX_ELEMENTS] = {0};


int max(int i, int j) {
   return ((i > j) ? i : j);
}


int knap(int i, int j) {
   int value;
   if (v[i][j] < 0) {
      if (j < w[i])
         value = knap(i - 1, j);
      else
```

```
            value = max(knap(i - 1, j), p[i] + knap(i - 1, j - w[i]));
        v[i][j] = value;
    }
    return v[i][j];
}

int main() {
    int profit, count = 0;

    printf("Enter the number of elements\n");
    scanf("%d", &n);
    if (n <= 0 || n > MAX_ELEMENTS) {
        printf("Invalid number of elements.\n");
        return 1;
    }

    printf("Enter the profit and weights of the elements\n");
    for (i = 1; i <= n; i++) {
        printf("For item no %d\n", i);
        scanf("%d%d", &p[i], &w[i]);
    }

    printf("Enter the capacity \n");
    scanf("%d", &cap);
    if (cap <= 0) {
        printf("Invalid capacity.\n");
        return 1;
    }

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

```
            if ((i == 0) || (j == 0))
                v[i][j] = 0;
            else
                v[i][j] = -1;

    profit = knap(n, cap);
    i = n;
    j = cap;

    while (j != 0 && i != 0) {
        if (v[i][j] != v[i - 1][j]) {
            x[i] = 1;
            j = j - w[i];
            i--;
        } else
            i--;
    }

    printf("Items included are\n");
    printf("Obj.no\tweight\tprofit\n");
    for (i = 1; i <= n; i++)
        if (x[i])
            {
                printf("%d\t%d\t%d\n",i, w[i], p[i]);++count;
            }

    printf("Total profit for %d objects = %d\n", count,profit);

    return 0;
}
```

OUTPUT:


Enter the profit and weights of the elements
For item no 1
10
5
For item no 2
15
3
For item no 3
13
2
For item no 4
18
2
Enter the capacity
10
Items included are
Obj.no weight profit
2 3 15
3 2 13
4 2 18
Total profit for 3 objects = 46
Process returned 0 (0x0) execution time : 17.868 s
Press any key to continue.