

WEEK 6

```
#include<stdio.h>
#include<conio.h>
void knapsack();
int max(int,int);
int i,j,n,m,p[10],w[10],v[10][10];
void main()
{
    printf("Enter the no. of items:\t");
    scanf("%d",&n);
    printf("Enter the weights of the each item:\n");
    for(i=1;i<=n;i++)
    {
        scanf("%d",&w[i]);
    }
    printf("Enter the profits:\n");
    for(i=1;i<=n;i++)
    {
        scanf("%d",&p[i]);
    }
    printf("Enter the capacity:");
    scanf("%d",&m);
    knapsack();
    getch();
}
void knapsack()
{
    int x[10];
    for(i=0;i<=n;i++)
    {
```

```

for(j=0;j<=m;j++)
{
    if(i==0 || j==0)
    {
        v[i][j]=0;
    }
    else if(j-w[i]<0)
    {
        v[i][j]=v[i-1][j];
    }
    else
    {
        v[i][j]=max(v[i-1][j],v[i-1][j-w[i]]+p[i]);
    }
}

printf("The output is:\n");
for(i=0;i<=n;i++)
{
    for(j=0;j<=m;j++)
    {
        printf("%d\t",v[i][j]);
    }
    printf("\n\n");
}

printf("Optimal solution is %d",v[n][m]);
printf("Solution vector is:\n");
for(i=n;i>=1;i--)
{
    if(v[i][m]!=v[i-1][m])
    {

```

```
x[i]=1;
m=m-w[i];
}
else
{
x[i]=0;
}
}
for(i=1;i<=n;i++)
{
printf("%d\t",x[i]);
}
}
int max(int x,int y)
{
if(x>y)
{
return x;
}
else
{
return y;
}
}
```

Output :

```
Enter the no. of items: 3
Enter the weights of the each item:
2 5 3
Enter the profits:
8 10 15
Enter the capacity: 9
The output is:
0      0      0      0      0      0      0      0      0      0
0      0      8      8      8      8      8      8      8      8
0      0      8      8      8      10     10     18     18     18
0      0      8      15     15     23     23     23     25     25

Optimal solution is 25Solution vector is:
0      1      1
```