1/0 Knapsack
ADA Lab

:- by 1BM21CS232

```
#include <stdio.h>
#include <conio.h>
int n, m, w[10], p[10], v[10][10];
int max(int a, int b)
{
    if (a > b)
        return a;
    else
        return b;
}

int knapsack()
{
        int i,j;
    for (i= 0; i <= n; i++)
    {
        for (j = 0; j <= m; j++)
        {
            if (i == 0 && j == 0)
            {
                v[i][j] = 0;
            }
            else if (w[i - 1] > j)
            {
                v[i][j] = v[i - 1][j];
            }
```

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            else
            {
                v[i][j] = max(v[i - 1][j], v[i - 1][j - w[i - 1]] + p[i - 1]);
            }
        }
    }
    return v[n][m];
}
void object_selected()
{
    int i = n, j = m,k;
    int x[10];
    for (k= 1; k <= n; k++)
    {
        x[k] = 0;
    }
    while (i != 0 && j != 0)
    {
        if (v[i][j] != v[i - 1][j])
        {
            x[i] = 1;
            j = j - w[i - 1];
        }
        i = i - 1;
    }

    for (i = 1; i <= n; i++)
    {
        if (x[i] == 1)
        {
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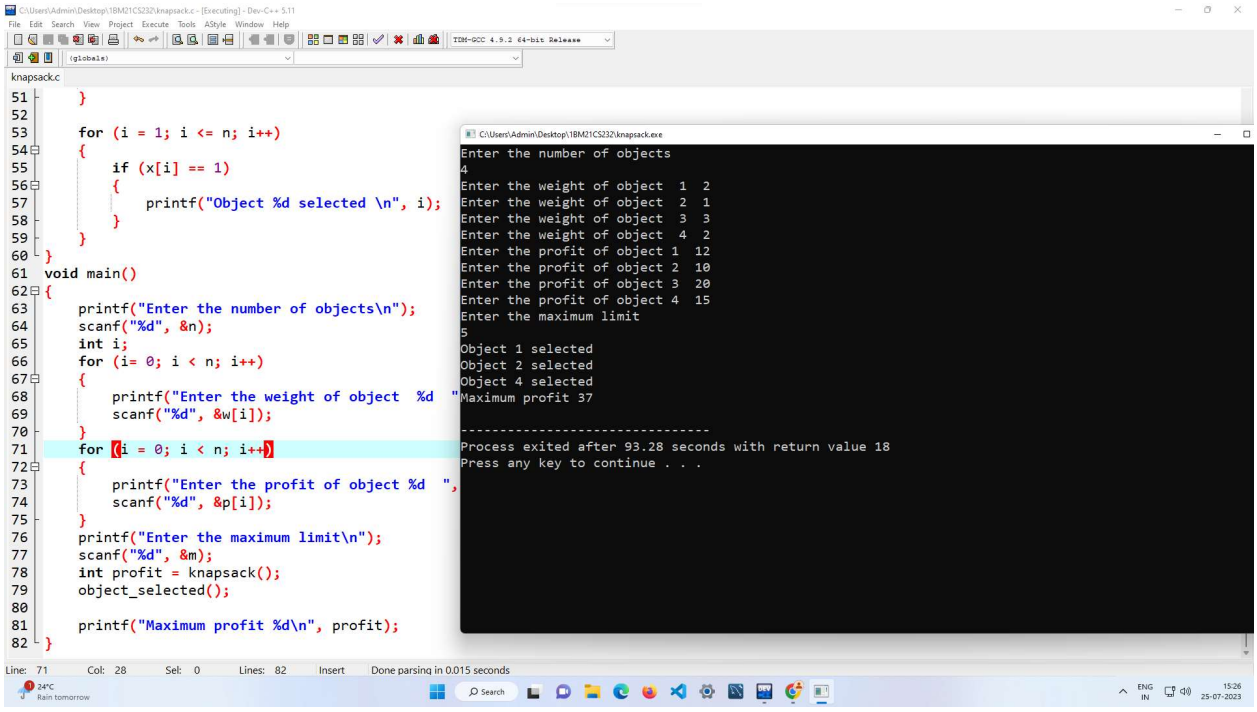
            printf("Object %d selected \n", i);
        }
    }
}
void main()
{
    printf("Enter the number of objects\n");
    scanf("%d", &n);
    int i;
    for (i= 0; i < n; i++)
    {
        printf("Enter the weight of object  %d  ", i + 1);
        scanf("%d", &w[i]);
    }
    for (i = 0; i < n; i++)
    {
        printf("Enter the profit of object %d  ", i + 1);
        scanf("%d", &p[i]);
    }
    printf("Enter the maximum limit\n");
    scanf("%d", &m);
    int profit = knapsack();
    object_selected();

    printf("Maximum profit %d\n", profit);
}
```

Output:


knapsack.c
}
for (i = 1; i <= n; i++)
{
if (x[i] == 1)
{
printf("Object %d selected \n", i);
}
}
}
void main()
{
printf("Enter the number of objects\n");
scanf("%d", &n);
int i;
for (i= 0; i < n; i++)
{
printf("Enter the weight of object %d "
scanf("%d", &w[i]);
}
for (i = 0; i < n; i++)
{
printf("Enter the profit of object %d "
scanf("%d", &p[i]);
}
printf("Enter the maximum limit\n");
scanf("%d", &m);
int profit = knapsack();
object_selected();
printf("Maximum profit %d\n", profit);
}
C:\Users\Admin\Desktop\1BM21CS232\knapsack.exe
Enter the number of objects
4
Enter the weight of object 1 2
Enter the weight of object 2 1
Enter the weight of object 3 3
Enter the weight of object 4 2
Enter the profit of object 1 12
Enter the profit of object 2 10
Enter the profit of object 3 20
Enter the profit of object 4 15
Enter the maximum limit
5
Object 1 selected
Object 2 selected
Object 4 selected
Maximum profit 37
Process exited after 93.28 seconds with return value 18
Press any key to continue . . .
Line: 71 Col: 28 Sel: 0 Lines: 82 Insert Done parsing in 0.015 seconds