

1/0 Knapsack ADA Lab

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```
#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];
            }
        }
    }
}
```

```

        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)
        {

```

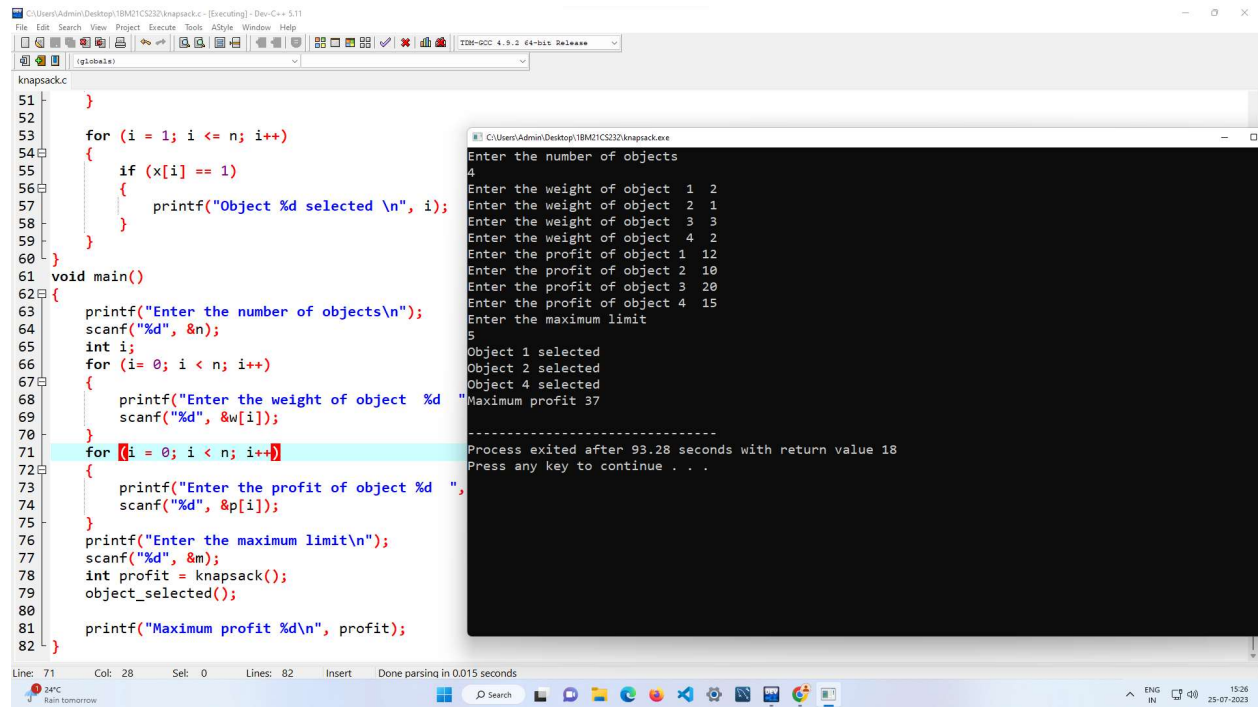
```

        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:



The image shows a C++ IDE with a source code editor on the left and a console window on the right. The source code is a C++ program for a knapsack problem. The console window shows the program's execution, including user input and the program's output.

```
knapsack.cc
51 }
52
53 for (i = 1; i <= n; i++)
54 {
55     if (x[i] == 1)
56     {
57         printf("Object %d selected \n", i);
58     }
59 }
60 }
61 void main()
62 {
63     printf("Enter the number of objects\n");
64     scanf("%d", &n);
65     int i;
66     for (i = 0; i < n; i++)
67     {
68         printf("Enter the weight of object %d ", i);
69         scanf("%d", &w[i]);
70     }
71     for (i = 0; i < n; i++)
72     {
73         printf("Enter the profit of object %d ", i);
74         scanf("%d", &p[i]);
75     }
76     printf("Enter the maximum limit\n");
77     scanf("%d", &m);
78     int profit = knapsack();
79     object_selected();
80
81     printf("Maximum profit %d\n", profit);
82 }
```

```
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 . . .
```