

Implement knapsack problem using dynamic programming

include <stdio.h>

int v[20][20];

int knap (int w[], int p[], int n, int ww)

```
{
    for (int i = 0; i < n + 1; i++)
    {
        for (int j = 0; j < ww + 1; j++)
        {
            if (i == 0 || j == 0)
            {
                v[i][j] = 0;
                continue;
            }

```

else

```
{
    if (w[i-1] > j)
    {
        v[i][j] = v[i-1][j];
    }

```

else

```
{
    if (v[i-1][j] > (v[i-1][j-w[i-1]] + p[i-1]))
    {
        v[i][j] = v[i-1][j];
    }

```

else

```
{
    v[i][j] = v[i-1][j-w[i-1]] + p[i-1];
}
}
```



```

    int q = v[n][ww];
    return q;
}

```

```

int main()
{
    int w[10], p[10], n, ww, ans;
    printf("Enter the number of items:");
    scanf("%d", &n);
    printf("Enter the weight and profit of each item:\n");
    for (int i = 0; i < n; i++)
    {
        scanf("%d %d", &w[i], &p[i]);
    }
    printf("Enter the required weight limit:");
    scanf("%d", &ww);
    ans = knap(w, p, n, ww);
    printf("Maximum profit: %d\n", ans);
    return 0;
}

```

Output :

Enter the number of items : 4
 Enter the weight and profit of each item :
 1 13
 2 14
 3 15
 4 16
 Enter the required weight limit : 5
 Maximum profit : 29.

```
Enter the number of items: 4
Enter the weight and profit of each item:
25
15
33
10
60
35
35
35
Enter the required weight limit: 60
0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      15     15     15     15
15     15     15     15     15     15     15     15     15     15     15     15     15     15
15     15     15     15     15     15     15     15     15     15     15     15     15     15
15     15     15     15
0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      15     15     15     15
15     15     15     15     15     15     15     15     15     15     15     15     15     15
15     15     15     15     15     15     15     15     15     15     15     15     15     15
15     25     25     25
0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      15     15     15     15
15     15     15     15     15     15     15     15     15     15     15     15     15     15
15     15     15     15     15     15     15     15     15     15     15     15     15     15
15     25     25     35
0      0      0      0      0      0      0      0      0      0      0      0      0      0
0      0      0      0      0      0      0      0      0      0      0      15     15     15     15
15     15     15     15     15     15     35     35     35     35     35     35     35     35
35     35     35     35     35     35     35     35     35     35     35     35     35     35
35     35     35     50
Maximum profit: 50
```