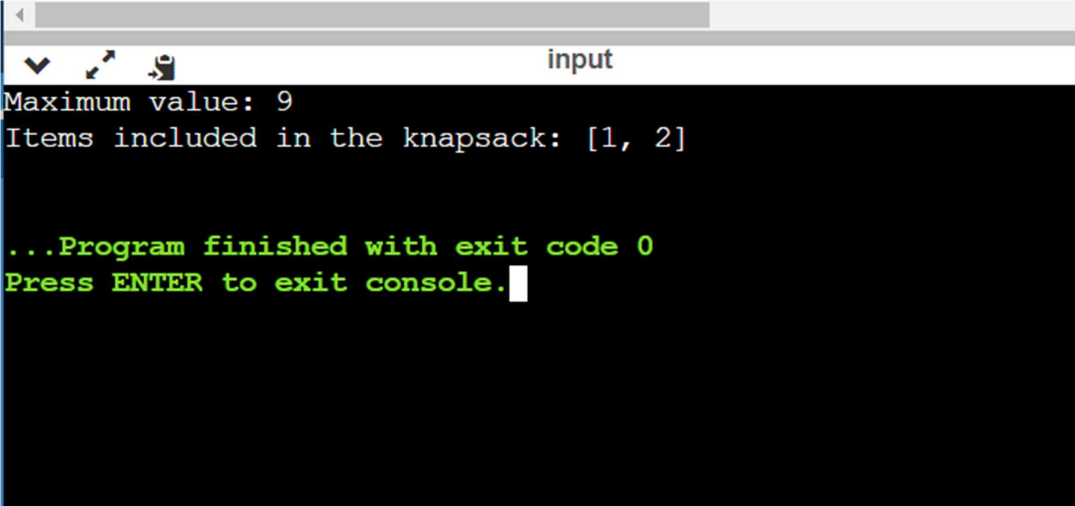**Problem – 4 0 – 1 Knapsack**

```python
def knapsack_01(weights, values, capacity):
    n = len(weights)
    dp = [[0 for _ in range(capacity + 1)] for _ in range(n + 1)]


    for i in range(1, n + 1):
        for w in range(1, capacity + 1):
            if weights[i - 1] <= w:
                dp[i][w] = max(values[i - 1] + dp[i - 1][w - weights[i - 1]], dp[i - 1][w])
            else:
                dp[i][w] = dp[i - 1][w]


    knapsack_items = []
    i, w = n, capacity
    while i > 0 and w > 0:
        if dp[i][w] != dp[i - 1][w]:
            knapsack_items.append(i - 1)
            w -= weights[i - 1]
        i -= 1


    knapsack_items.reverse()
    return dp[n][capacity], knapsack_items


weights = [1, 3, 4, 5]
values = [1, 4, 5, 7]
capacity = 7


max_value, items = knapsack_01(weights, values, capacity)
print("Maximum value:", max_value)
print("Items included in the knapsack:", items)
```

```
input

Maximum value: 9
Items included in the knapsack: [1, 2]


...Program finished with exit code 0
Press ENTER to exit console.
```