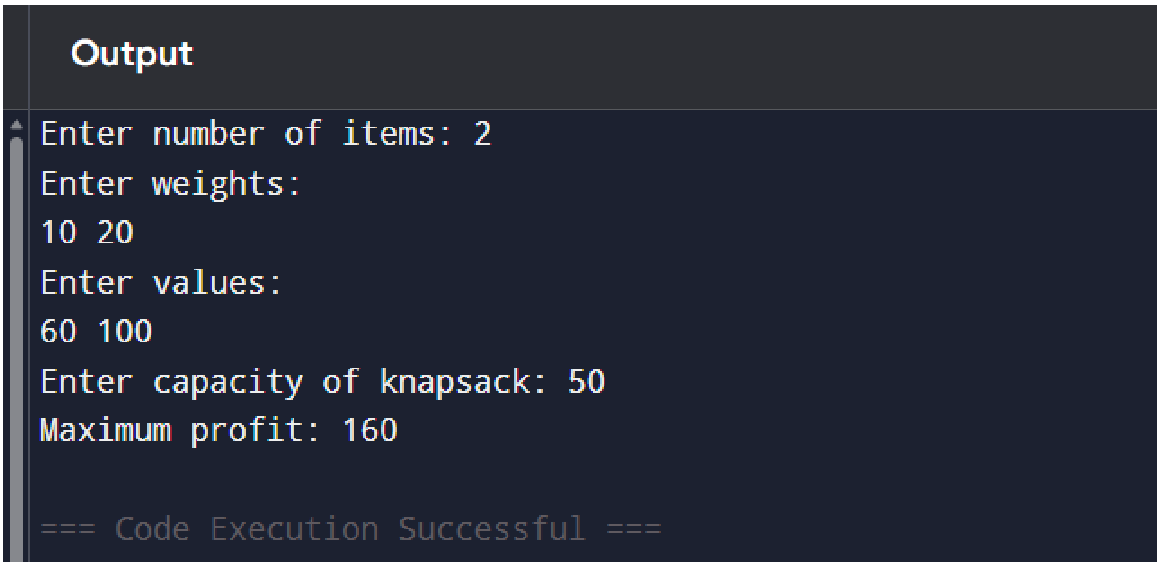
Knapsack Problem (0/1 Knapsack – Dynamic Programming)

```
#include <iostream>
using namespace std;

int max(int a, int b) {
  return (a > b) ? a : b;
}

int main() {
  int n, W;
  cout << "Enter number of items: ";
  cin >> n;

  int wt[n], val[n];
  cout << "Enter weights:\n";
  for(int i = 0; i < n; i++)
    cin >> wt[i];

  cout << "Enter values:\n";
  for(int i = 0; i < n; i++)
    cin >> val[i];

  cout << "Enter capacity of knapsack: ";
  cin >> W;

  int dp[n + 1][W + 1];

  for(int i = 0; i <= n; i++) {
        for(int w = 0; w <= W; w++) {
          if(i == 0 || w == 0)
            dp[i][w] = 0;
          else if(wt[i - 1] <= w)
            dp[i][w] = max(val[i - 1] + dp[i - 1][w - wt[i - 1]],
                          dp[i - 1][w]);
          else
            dp[i][w] = dp[i - 1][w];
        }
      }

      cout << "Maximum profit: " << dp[n][W];
      return 0;
    }
```

Output :



Output

```
Enter number of items: 2
Enter weights:
10 20
Enter values:
60 100
Enter capacity of knapsack: 50
Maximum profit: 160

=== Code Execution Successful ===
```