CHANDIGARH UNIVERSITY

UNIVERSITY INSTITUTE OF NGINEERING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Submitted By: Vivek Kumar(21BCS8129)	**Submitted To:** Neha Dutta(E12830)
Subject Name	Design and Analysis of Algorithm Lab
Subject Code	20CSP-312
Branch	Computer Science and Engineering
Semester	5th

Experiment - 7

Student Name: Vivek Kumar **UID: 21BCS8129**
Branch: BE-CSE(LEET) **Section/Group: 20BCS-WM-616/A**
Semester: 5th **Date of Performance: 31/10/2022**
Subject Name: DAA Lab **Subject Code: 20CSP-312**

1. Aim/Overview of the practical:

Code to implement 0-1 Knapsack using Dynamic Programming

2. Task to be done/ Which logistics used:

Write a program to implement 0-1 Knapsack using the dynamic programming.

3. Requirements (For programming-based labs):

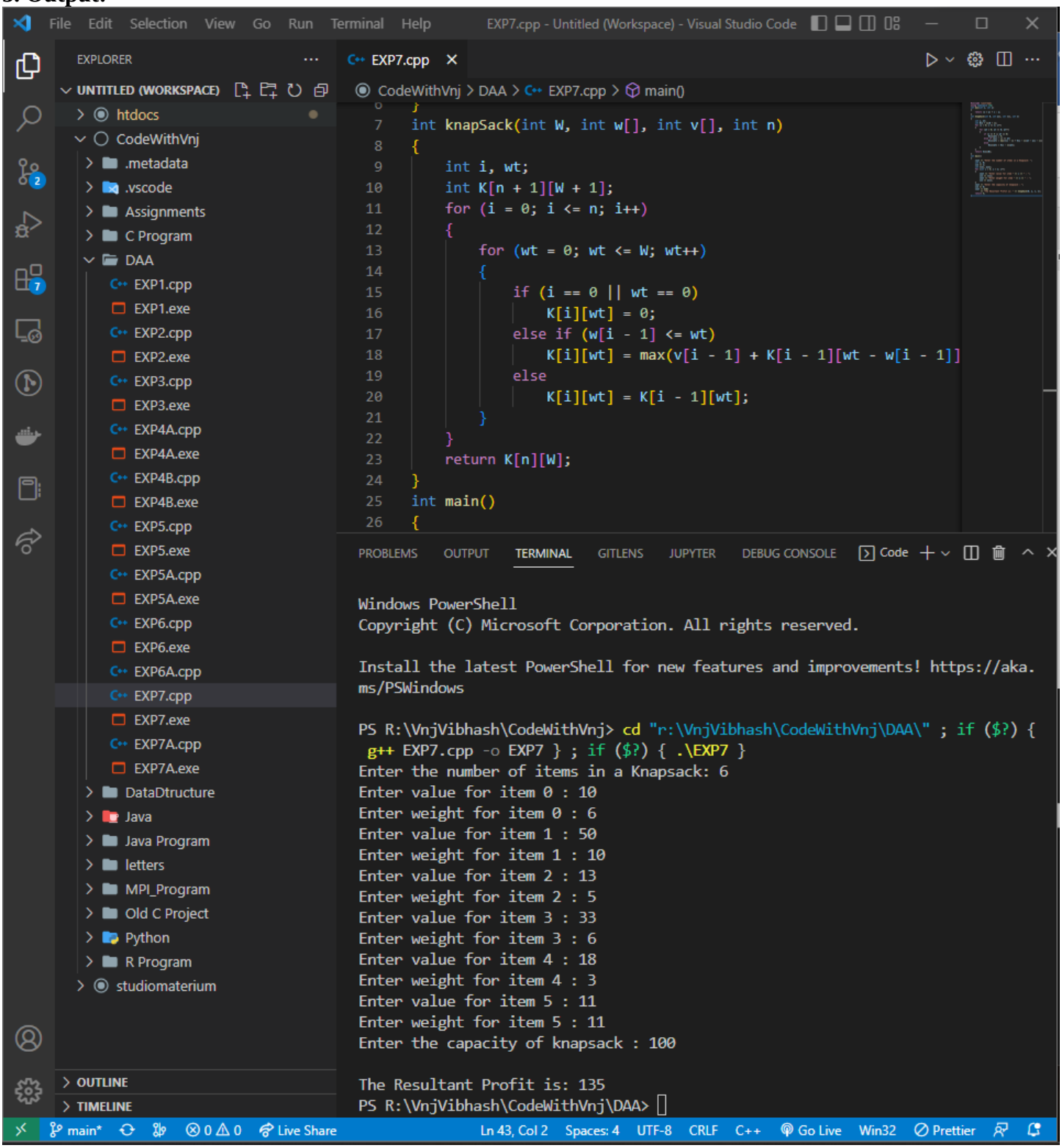
- Laptop or PC.
- Operation system (Mac, Windows, Linux, or any)
- Vs-Code with MinGw or any C++ Compiler

4. Steps for experiment/practical/Code:

```
#include <iostream>
#include <iostream>
using namespace std;
int max(int x, int y)
{
    return (x > y) ? x : y;
}
int knapSack(int W, int w[], int v[], int n)
{
    int i, wt;
    int K[n + 1][W + 1];
    for (i = 0; i <= n; i++)
    {
        for (wt = 0; wt <= W; wt++)
        {
            if (i == 0 || wt == 0)
                K[i][wt] = 0;
            else if (w[i - 1] <= wt)
                K[i][wt] = max(v[i - 1] + K[i - 1][wt - w[i - 1]], K[i - 1][wt]);
            else
                K[i][wt] = K[i - 1][wt];
        }
    }
    return K[n][W];
}
```

```
int main()
{
    cout << "Enter the number of items in a Knapsack: ";
    int n, W;
    cin >> n;
    int v[n], w[n];
    for (int i = 0; i < n; i++)
    {
        cout << "Enter value for item " << i << " : ";
        cin >> v[i];
        cout << "Enter weight for item " << i << " : ";
        cin >> w[i];
    }
    cout << "Enter the capacity of knapsack : ";
    cin >> W;
    cout << endl
         << "The Resultant Profit is: " << knapSack(W, w, v, n);
    return 0;
}
```

5. Output:



Learning outcomes (What I have learnt):

1. How to solve the 0-1 Knapsack using dynamic programming.

Evaluation Grid (To be created per the faculty's SOP and Assessment guidelines):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Worksheet completion including writing learning objectives/Outcomes. (To be submitted at the end of the day).		
2.	Post-Lab Quiz Result.		
3.	Student Engagement in Simulation/Demonstration/Performance and Controls/Pre-Lab Questions.		
	Signature of Faculty (with Date):	Total Marks Obtained:	