Experiment No: 03

Experiment Name: (0/1) Knapsack

Question:

Given,

w = {1,2,3}

p = {6,10,9}

Max Profit →

		0	1	2	3	4	5
p	w	0	0	0	0	0	0
6	1	0	6	6	6	6	6
10	2	0	6	10	16	16	16
9	3	0	6	10	16	16	19

Code:

```
def knapsack(w, p, cap, n):
    profit = [[0 for _ in range(cap+1)] for _ in range(n+1)]

    for i in range(1, n+1):
        for weight in range(1, cap+1):
            if w[i-1] <= weight:
                profit[i][weight] = max(profit[i-1][weight], p[i-1] + profit[i-1][weight - w[i-1]])
            else:
                profit[i][weight] = profit[i-1][weight]

    return profit[n][cap]

cap = 5
w = [1, 2, 3]
```

```
p = [6, 10, 9]
n = len(w)

max_profit = knapsack(w, p, cap, n)
print("Max Profit: ", max_profit)
```

Output:

```
Max Profit:  19
```