

Experiment No: 02

Experiment Name: Determining Max profit by fractional knapsack.

Code:

```
class Item:
```

```
    def __init__(self, weight, profit):
```

```
        self.weight = weight
```

```
        self.profit = profit
```

```
def compare(item):
```

```
    return item.profit / item.weight
```

```
def knapsack(items, cap):
```

```
    currweight = 0
```

```
    maxprofit = 0
```

```
    items.sort(key=compare, reverse=True)
```

```
    for item in items:
```

```
        if currweight + item.weight <= cap:
```

```
            currweight += item.weight
```

```
            maxprofit += item.profit
```

```
            print(f"Taken weight = {currweight}, Max profit = {maxprofit}")
```

```
        else:
```

```
            remain = cap - currweight
```

```
            fweight = remain / item.weight
```

```
            maxprofit += item.profit * fweight
```

```
            currweight += remain # Update current weight to the cap
```

```
            print(f"Taken weight = {currweight}, Max profit = {maxprofit}")
```

```
break
```

```
return maxprofit
```

```
items = [Item(5, 12), Item(10, 25), Item(7, 19), Item(12, 13)]
```

```
cap = 18
```

```
maxprofit = knapsack(items, cap)
```

```
print(f"Max profit = {maxprofit:.2f}")
```

Output:

Taken weight = 7, Max profit = 19

Taken weight = 17, Max profit = 44

Taken weight = 18, Max profit = 46.4

Max profit = 46.40

#(lab report made by Arsalan)