

## 112) Knapsack problem using greedy

CODE:

```
def knapsack_greedy(weights, values, capacity):
    n = len(weights)
    value_per_weight = [(values[i] / weights[i], weights[i], values[i]) for i in
range(n)]
    value_per_weight.sort(reverse=True, key=lambda x: x[0])

    total_value = 0
    total_weight = 0

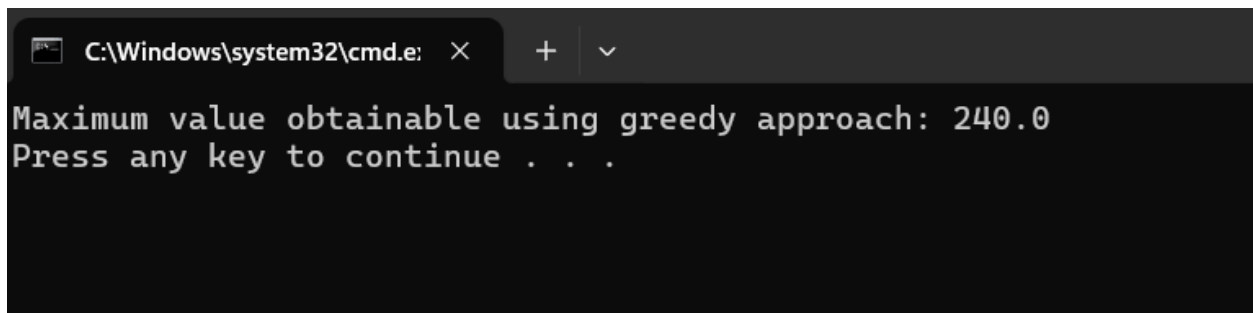
    for ratio, weight, value in value_per_weight:
        if total_weight + weight <= capacity:
            total_value += value
            total_weight += weight
        else:
            remaining_capacity = capacity - total_weight
            total_value += ratio * remaining_capacity
            break

    return total_value

if __name__ == "__main__":
    weights = [10, 20, 30]
    values = [60, 100, 120]
    capacity = 50

    max_value = knapsack_greedy(weights, values, capacity)
    print(f"Maximum value obtainable using greedy approach: {max_value}")
```

OUTPUT:

A screenshot of a Windows command prompt window. The title bar shows the path 'C:\Windows\system32\cmd.e' and standard window controls. The command prompt displays the output of the program: 'Maximum value obtainable using greedy approach: 240.0' followed by 'Press any key to continue . . .' on the next line. The text is white on a black background.

```
C:\Windows\system32\cmd.e: X + v
Maximum value obtainable using greedy approach: 240.0
Press any key to continue . . .
```

TIME COMPLEXITY :  $O(n)$