 <b>Marwadi</b> University	<b>Marwadi University</b> <b>Faculty of Technology</b> <b>Department of Information and Communication Technology</b>	
<b>Subject: DAA (01CT0512)</b>	<b>AIM: 1/0 Knapsack using Greedy Approach</b>	
<b>Experiment No: 14</b>	<b>Date: 12/9/2023</b>	<b>Enrolment No: 92100133020</b>

### 1/0 Knapsack using Greedy Approach:

Greedy approach does not guarantee the optimal solution for 0/1 knapsack as it chooses items based on immediate benefit without considering the overall weight constraints.

#### Algorithm:

Select items in decreasing order of their values and include them in the knapsack if they fit, until the knapsack is full.

#### Code:

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


struct Item {
    int weight, value;
};

bool comparison(Item a, Item b) {
    return (a.value > b.value);
}

int knapsackGreedy(Item items[], int n, int capacity) {
    sort(items, items + n, comparison);
    int totalValue = 0, currentWeight = 0;

    for (int i = 0; i < n; i++) {
        if (currentWeight + items[i].weight <= capacity) {
            currentWeight += items[i].weight;
            totalValue += items[i].value;
        }
    }
    return totalValue;
}

int main() {
    Item items[] = {{10, 60}, {20, 100}, {30, 120}};
    int capacity = 50;
    int n = sizeof(items) / sizeof(items[0]);
    cout << "Maximum value in Knapsack: " << knapsackGreedy(items, n, capacity);
    return 0;
}
```

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**Output:**

Maximum value in Knapsack: 220

Space complexity: \_\_\_\_\_

Justification: \_\_\_\_\_  
 \_\_\_\_\_

Time complexity:

Best case time complexity: \_\_\_\_\_

Justification: \_\_\_\_\_  
 \_\_\_\_\_

Worst case time complexity: \_\_\_\_\_

Justification: \_\_\_\_\_  
 \_\_\_\_\_