Assignment No 3 :- Write a program to solve a fractional Knapsack problem using a greedy method.

Code:-

```
#include <bits/stdc++.h> using
namespace std;

struct Item
{
    int value;
    int weight;
};

class Solution
{
public:
    static bool comp(Item a, Item b)
    {
        double r1 = (double) a.value / (double) a.weight;
        double r2 = (double) b.value / (double) b.weight;
        return r1 > r2;
    }

    double fractionalKnapsack(int W, Item arr[], int n)
    {
        sort(arr, arr + n, comp);
        int curWeight = 0;
        double finalvalue = 0.0;

        for (int i = 0; i < n; i++)
        {
            if (curWeight + arr[i].weight <= W)
            {
                curWeight += arr[i].weight;
                finalvalue += arr[i].value;
            }
            else
            {
                int remain = W - curWeight; finalvalue += (arr[i].value / (double)
                arr[i].weight) * (double) remain; break;
            }
```

```
        }
        return finalvalue;
    }
};

int main()
{
    int n, weight; cout << "Enter the
    number of items: "; cin >> n;

    Item arr[n]; cout << "\nEnter the weight and value for each
    item:" << endl; for (int i = 0; i < n; i++)
    {
        cout << "Item " << i + 1 << ": ";
        cin >> arr[i].value >> arr[i].weight;
    }

    cout << "\nEnter the capacity of the knapsack: ";
    cin >> weight;

    Solution obj; double ans = obj.fractionalKnapsack(weight, arr, n); cout <<
    "\nThe maximum value is " << setprecision(2) << fixed << ans << endl;

    return 0;
}
```

Output :-

```
Enter the number of items: 3

Enter the weight and value for each item:
Item 1: 60 10
Item 2: 100 20
Item 3: 120 30

Enter the capacity of the knapsack: 50

The maximum value is 240.00

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Process exited after 28.09 seconds with return value 0
Press any key to continue . . .
```