**DAA Assignment 3 Fractional Knapsack Problem**

**Code:**

class Item:

    def \_\_init\_\_(self, weight, value):

        self.weight = weight

        self.value = value

        self.value\_per\_weight = value / weight

    def \_\_lt\_\_(self, other):

        return self.value\_per\_weight < other.value\_per\_weight

def fractional\_knapsack(items, capacity):

    items.sort(reverse=True)

    total\_value = 0

    for item in items:

        if item.weight <= capacity:

            capacity -= item.weight

            total\_value += item.value

        else:

            fraction = capacity / item.weight

            total\_value += item.value \* fraction

            break

    return total\_value

def main():

    num\_items = int(input("Enter the number of items: "))

    items = []

    for i in range(num\_items):

        weight = float(input(f"Enter the weight of item {i+1}: "))

        value = float(input(f"Enter the value of item {i+1}: "))

        items.append(Item(weight, value))

    capacity = float(input("Enter the capacity of the knapsack: "))

    total\_value = fractional\_knapsack(items, capacity)

    print(f"Total value in the knapsack: {total\_value:.2f}")

if \_\_name\_\_ == "\_\_main\_\_":

    main()

**Output:**

Enter the number of items: 3

Enter the weight of item 1: 10

Enter the value of item 1: 60

Enter the weight of item 2: 20

Enter the value of item 2: 100

Enter the weight of item 3: 30

Enter the value of item 3: 120

Enter the capacity of the knapsack: 50

Total value in the knapsack: 240.00