

Name : Shraddha Rajkumar Kotwar
Roll No.: 14

ASSIGNMENT NO : 3

Write a program to solve a fractional Knapsack problem using a greedy method.

```
class Item:
    def __init__(self, profit, weight):
        self.profit = profit
        self.weight = weight

def fractionalKnapsack(W, arr):

    arr.sort(key=lambda x: (x.profit/x.weight), reverse=True)
    finalvalue = 0.0

    for item in arr:
        if item.weight <= W:
            W -= item.weight
            finalvalue += item.profit

        else:
            finalvalue += item.profit * W / item.weight
            break

    return finalvalue

def take_user_input():
    arr = []
    while True:
        try:
            value = int(input("Enter value for the item (enter a non-numeric value to stop): "))
            weight = int(input("Enter weight for the item: "))
            arr.append(Item(value, weight))
        except ValueError:
            break
    return arr
```

```

if __name__ == "__main__":
    W = 50
    print("Enter values for each item. Enter any non-numeric value to stop entering items.")
    arr = take_user_input()
    max_val = fractionalKnapsack(W, arr)
    print(max_val)

```

```

def fractionalKnapsack(W, arr):
    arr.sort(key=Lambda x: (x.profit/x.weight), reverse=True)
    finalvalue = 0.0
    for item in arr:
        if item.weight <= W:
            W -= item.weight
            finalvalue += item.profit
        else:
            finalvalue += item.profit * W / item.weight
            break
    return finalvalue

def take_user_input():
    arr = []
    while True:
        try:
            value = int(input("Enter value for the item (enter a non-numeric value to stop): "))
            weight = int(input("Enter weight for the item: "))
            arr.append(Item(value, weight))
        except ValueError:
            break
    return arr

if __name__ == "__main__":
    W = 50
    print("Enter values for each item. Enter any non-numeric value to stop entering items.")
    arr = take_user_input()
    max_val = fractionalKnapsack(W, arr)
    print(max_val)

```

Enter values for each item. Enter any non-numeric value to stop entering items.
Enter value for the item (enter a non-numeric value to stop): 60
Enter weight for the item: 10
Enter value for the item (enter a non-numeric value to stop): 100
Enter weight for the item: 20
Enter value for the item (enter a non-numeric value to stop): 120
Enter weight for the item: 30
Enter value for the item (enter a non-numeric value to stop): abhjbghj
240.0

Activities Firefox Web Browser Jul 11 15:34

localhost:8888/notebooks/knapsack.ipynb 150%

jupyter knapsack Last Checkpoint: 6 minutes ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 (ipykernel)

```
while True:
    try:
        value = int(input("Enter value for the item (enter a non-numeric value to stop): "))
        weight = int(input("Enter weight for the item: "))
        arr.append(Item(value, weight))
    except ValueError:
        break
return arr

if __name__ == "__main__":
    W = 50
    print("Enter values for each item. Enter any non-numeric value to stop entering items.")
    arr = take_user_input()
    max_val = fractionalKnapsack(W, arr)
    print(max_val)
```

Enter values for each item. Enter any non-numeric value to stop entering items.
Enter value for the item (enter a non-numeric value to stop): 60
Enter weight for the item: 10
Enter value for the item (enter a non-numeric value to stop): 100
Enter weight for the item: 20
Enter value for the item (enter a non-numeric value to stop): 120
Enter weight for the item: 30
Enter value for the item (enter a non-numeric value to stop): abhjbghj
240.0

In []: