**Problem Statement: Maximum Unit of Boxes**

You are assigned to put some amount of boxes onto one truck. You are given a 2D array boxTypes, where boxTypes[i] = [numberOfBoxes(i), numberOfUnitsPerBox(i)]:

* numberOfBoxes(i) is the number of boxes of type i.
* numberOfUnitsPerBox(i) is the number of units in each box of the type i.

You are also given an integer truckSize, which is the maximum number of boxes that can be put on the truck. You can choose any boxes to put on the truck as long as the number of boxes does not exceed truckSize.

Print the maximum total number of units that can be put on the truck.

**Input Format**

* The first line contains two space-separated integers N and K (truck size).
* The next N lines contain boxtype[i] where each boxtype is of size 2.

**Constraints**

* 1 <= boxTypes.length <= 1000
* 1 <= numberOfBoxes(i),numberOfUnitsPerBox(i) <= 1000
* 1 <= truckSize <= 10^6

**Output Format**

An integer denoting the maximum unit of boxes.

**Sample Input**

4 10

5 10

2 5

4 7

3 9

**Sample Output**

91

**Explanation**

Take the boxes optimally until the truck is full:

* 5 boxes from the first boxType, so units = 5 \* 10 = 50
* 3 boxes from the 4th boxType, so units = 3 \* 9 = 27
* 2 boxes from the 3rd boxType, so units = 2 \* 7 = 14

So maximum total number of units = 50 + 27 + 14 = 91.

**Solution**

To solve this problem, we need to use a greedy approach:

1. Sort the boxTypes array based on numberOfUnitsPerBox in descending order.
2. Iterate through the sorted list and add boxes to the truck until the truck is full or there are no more boxes left.

Here's the implementation in Python:

python

Copy code

def maximum\_units(boxTypes, truckSize):

# Sort boxTypes based on the number of units per box in descending order

boxTypes.sort(key=lambda x: x[1], reverse=True)

max\_units = 0

for numberOfBoxes, numberOfUnitsPerBox in boxTypes:

if truckSize <= 0:

break

# Take as many boxes as possible, but not more than the truck can carry

boxes\_to\_take = min(truckSize, numberOfBoxes)

max\_units += boxes\_to\_take \* numberOfUnitsPerBox

truckSize -= boxes\_to\_take

return max\_units

# Sample Input

N = 4

truckSize = 10

boxTypes = [

[5, 10],

[2, 5],

[4, 7],

[3, 9]

]

# Sample Output

print(maximum\_units(boxTypes, truckSize)) # Output: 91

**Additional Test Cases**

**Test Case 1**

**Input:**

3 5

1 3

2 2

3 1

**Output:**

9

**Test case 1**

**Input**

4 10

5 10

2 5

4 7

3 9

**Output**

91

**Test case 2**

**Input**

5 8

1 7

6 6

9 1

5 1

9 3

**Output**

46

**Test case 3**

**Input**

4 10

5 10

2 5

4 7

3 9

**Output**

91

**Test case 4**

**Input**

3 4

1 3

2 2

3 1

**Output**

8

**Test case 5**

**Input**

7 13

2 7

13 6

2 1

8 1

2 3

5 10

5 2

**Output**

100