Python Problem Set 2

Monday, 26.08.2019

Topics

Data Types

Branching and Iteration

Functions

List, Tuples, Set, Dictionary

Problem 1

Chef went to the store in order to buy one can of coke. In the store, they offer N cans of coke (numbered 1 through N). For each valid i, the current temperature of the i-th can is C_i and its price is P_i.

After buying a can of coke, Chef wants to immediately start walking home; when he arrives, he wants to immediately drink the whole can. It takes Chef M minutes to get home from the store.

The ambient temperature outside is K. When a can of coke is outside, its temperature approaches the ambient temperature. Specifically, if its temperature is t at some point in time:

- if $t > K + 1$, then one minute later, its temperature will be $t - 1$
- if $t < K - 1$, then one minute later, its temperature will be $t + 1$
- if $K - 1 \leq t \leq K + 1$, then one minute later, its temperature will be K

When Chef drinks coke from a can, he wants its temperature to be between L and R (inclusive). Find the cheapest can for which this condition is satisfied or determine that there is no such can.

Input

- The first line of the input contains a single integer T denoting the number of test cases. The description of T test cases follows.
- The first line of each test case contains five space-separated integers N, M, K, L and R.
- N lines follow. For each i ($1 \leq i \leq N$), the i-th of these lines contains two space-separated integers C_i and P_i.

Output

For each test case, print a single line containing one integer — the price of the can Chef should buy, or -1 if it is impossible to buy a can such that Chef's condition is satisfied.

Constraints

- $1 \leq T \leq 1,000$

- $1 \leq N \leq 100$
- $1 \leq M \leq 100$
- $|C_i| \leq 50$ for each valid i
- $|K| \leq 50$
- $-50 \leq L \leq R \leq 50$
- $1 \leq P_i \leq 10^6$ for each valid i

Example Input

```
2
3 2 5 4 6
1 6
2 8
8 10
3 5 10 20 30
21 20
22 22
23 23
```

Example Output

```
8
-1
```

Problem 2

Implement the *unique_names* method. When passed two arrays of names, it will return an array containing the names that appear in **either or both** arrays. The returned array should have no duplicates.

For example, calling *unique_names(['Ava', 'Emma', 'Olivia'], ['Olivia', 'Sophia', 'Emma'])* should return an array containing Ava, Emma, Olivia, and Sophia in any order.

```
def unique_names(names1, names2):

    #Modify code here

    return None

names1 = ["Ava", "Emma", "Olivia"]

names2 = ["Olivia", "Sophia", "Emma"]

print(unique_names(names1, names2))

 # should print ['Ava', 'Emma', 'Olivia', 'Sophia']
```

Problem 3

Answer the following questions:

1. What is the output of the following code:

```
a=range(5)
b=range(10)
result=list(zip(a,b))
print(result)
```

2. What gets printed?

```
name='python'
while bool(name)==False:
    print('hi')
```

3. Choose the correct output:

```
if False:
    print('Hi')
elif True:
    print('Hello')
else:
    print('Howdy')
```

    A. Hi

    B. Hello

    C. Howdy

    D. Hello

       Howdy

    E. Nothing is printed

4. What is the output of the following code?

```
print ("Hello"'World')
```

    A. HelloWorld

    B. Hello World

    C. Hello

       World

    D. Syntax Error

5. Choose the correct output for the following code:

```
num1=5
if num1>91:
   num2=3
else:
   if num1<6:
      num2=4
   else:
      num2=2
x=num2*num1+1
print(x,x%7)
```

A. 21 3

B. 21 0

C. 213

D. 21 21

E. None

Problem 4

1. What is the output of the following code?

```
def addItem(listParam):
   listParam+=[1]
mylist=[1,2,3,4]
addItem(mylist)
print (len(mylist))
```

A. 4

B. 5

C. 0

D. None of the above

2. What is the output of the code below?

```
def myfunc(x,y,z,a):
    print(x+y)
nums=[1,2,3,4]
myfunc(*nums)
```

Problem 5

Consider the grid of points shown at the top of the next column. Suppose that, starting at the point labeled A9 you can go one step up or one step to the right at each move. This procedure is continued until the point labeled B is reached. How many different paths from A to B are possible?
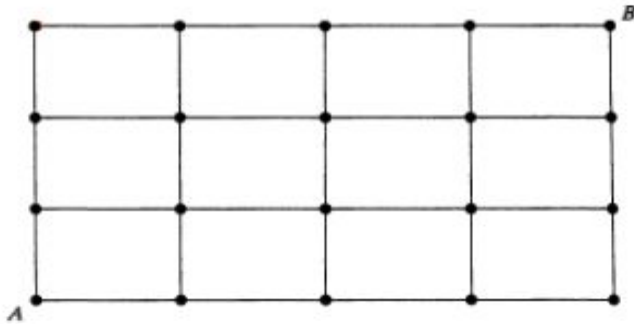
Write a program to find the number of different paths from A to B given number of rows and columns:

Example:

Input:

5 6

Output:

462