Program to find an element in a progressive/increasing matrix.

1 message

Varun Gupta <varungupta3009@gmail.com> Wed, Jul 19, 2017 at 4:48 PM
To: CAT_2017_BATCH1 <cat_2017_batch1@googlegroups.com>

The program has been created in Python.
Those who do not have Python, download the latest version from https://www.python.org/ftp/python/3.6.2/python-3.6.2.exe

The Source Code has been attached below. I have also provided the raw text here.

Because the matrix is generated randomly, there may be more than one equal elements in it, but the result prints the location of both the elements anyways. An example has been shown below.

Example:

```
Please enter the number of rows in the matrix - 5
Please enter the number of columns in the matrix - 5

Generated Matrix:
10      14      17      25      34
11      22      29      33      39
20      26      30      42      46
22      34      38      43      54
30      44      50      53      58

Please enter the element to be searched for - 22

The element 22 has been found at location a[1][1].

The element 22 has been found at location a[3][0].
```

Raw Text:

```
#! python 3
# sortedMatrixFinder.py - Finds a given element in a randomly generated
# sorted matrix.
# Created by Varun R. Gupta

import random

while True:
    row = input("Please enter the number of rows in the matrix - ")
    try:
        row = int(row)
        break
    except ValueError:
        print("Please enter a valid integer")
        continue
    if row < 1:
        print("Please enter a valid integer greater than 1")

while True:
    col = input("Please enter the number of columns in the matrix - ")
    try:
        col = int(col)
        break
    except ValueError:
        print("Please enter a valid integer")
        continue
```

```
    if col < 1:
        print("Please enter a valid integer greater than 1")

a = [[]]

a[0].append(random.randint(1, 10))
a.append([])

for i in range(1, row):
    tmp = random.randint(1, 10) + a[i-1][0]
    a[i].append(tmp)
    a.append([])

for j in range(1, col):
    tmp = random.randint(1, 10) + a[0][j-1]
    a[0].append(tmp)

for i in range(1, row):
    for j in range(1, col):
        tmp = random.randint(1, 10) + a[i-1][j]
        while not (tmp > a[i][j-1]):
            tmp += random.randint(1, 10)
        a[i].append(tmp)

print("\nGenerated Matrix:")

for i in range(0, row):
    for j in range(0, col):
        print(a[i][j], end = "\t")
    print()

while True:
    ele = input("\nPlease enter the element to be searched for - ")
    try:
        ele = int(ele)
        break
    except ValueError:
        print("Please enter a valid integer")

i = 0
j = col-1
check = 0

while i < row and j >= 0:
    if a[i][j] == ele:
        print("\nThe element %d has been found at location a[%d][%d]." %(ele, i,
j))
        check = 1
    if a[i][j] > ele:
        j -= 1
    else:
        i += 1

if check == 0:
    print("\nThe element ", ele, " is not present in the matrix.")

input()
```

Thank you and please comment your thoughts/suggestions below.

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sortedMatrixFinder.py
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