Assignment -1

Python Programming

Assignment Date	29 September 2022
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Maximum Marks	2 Marks

Question-1:

Write a Python program to remove all instances of a given value from a given array of integers and find the length of the new array.

Solution:

```
def remove_element(array_nums, val):
i = 0
while i < len(array_nums):
if array_nums[i] == val:
array_nums.remove(array_nums[i])

else:
i += 1

return len(array_nums)
print(remove_element([1, 2, 3, 4, 5, 6, 7, 5], 5))
print(remove_element([10,10,10,10,10], 10))
print(remove_element([10,10,10,10,10], 20))
print(remove_element([], 1))
```

Output:

Question-2:

Write a Python program to print a given N by M matrix of numbers line by line in forward > backwards > forward >... order.

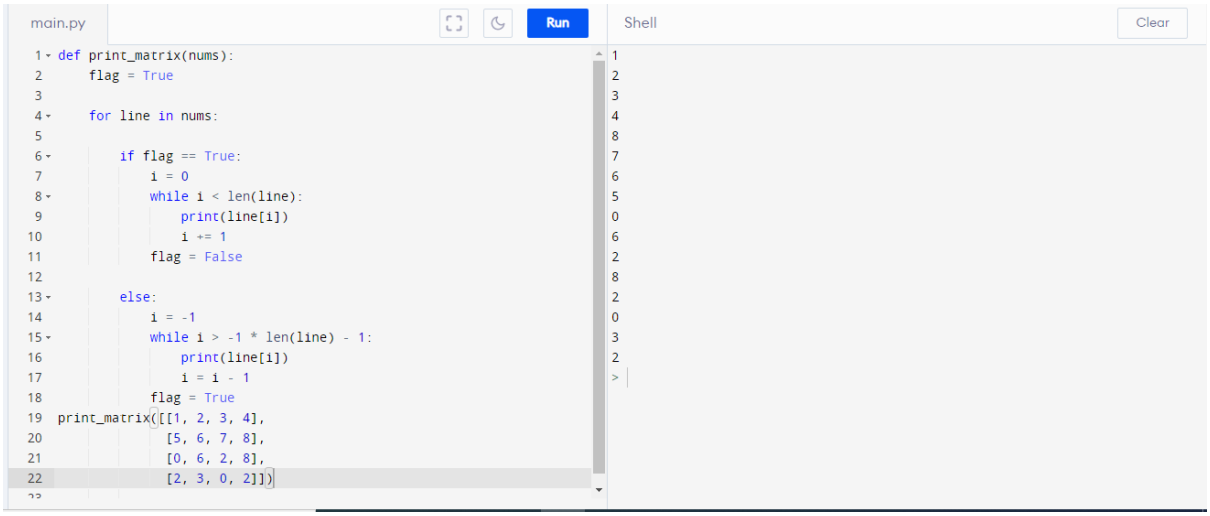
Input matrix:
[[1, 2, 3, 4],
[5, 6, 7, 8],
[0, 6, 2, 8],
[2, 3, 0, 2]]

Solution:

```
def print_matrix(nums):
    flag = True

    for line in nums:

        if flag == True:
            i = 0
            while i < len(line):
                print(line[i])
```

```
            i += 1
        flag = False

    else:
        i = -1
        while i > -1 * len(line) - 1:
            print(line[i])
            i = i - 1
        flag = True
print_matrix([[1, 2, 3, 4],
              [5, 6, 7, 8],
              [0, 6, 2, 8],
              [2, 3, 0, 2]])
```

Output;



Question-3:

Write a Python program to compute the largest product of three integers from a given list of integers.
Sample Input:
[-10, -20, 20, 1]
[-1, -1, 4, 2, 1]
[1, 2, 3, 4, 5, 6]

Solution:

```
def largest_product_of_three(nums):
    max_val = nums[1]

    for i in range(len(nums)):
        for j in range(i+1, len(nums)):
            for k in range(j+1, len(nums)):
                max_val = max(nums[i] * nums[j] * nums[k], max_val)

    return max_val

print(largest_product_of_three([-10, -20, 20, 1]))
print(largest_product_of_three([-1, -1, 4, 2, 1]))
print(largest_product_of_three([1, 2, 3, 4, 5, 6]))
```

Output:

```
def largest_product_of_three(nums):
    max_val = nums[1]

    for i in range(len(nums)):
        for j in range(i+1, len(nums)):
            for k in range(j+1, len(nums)):
                max_val = max(nums[i] * nums[j] * nums[k], max_val)

    return max_val

print(largest_product_of_three([-10, -20, 20, 1]))
print(largest_product_of_three([-1, -1, 4, 2, 1]))
print(largest_product_of_three([1, 2, 3, 4, 5, 6]))
```

```
4000
8
120
>
```

Question-4:

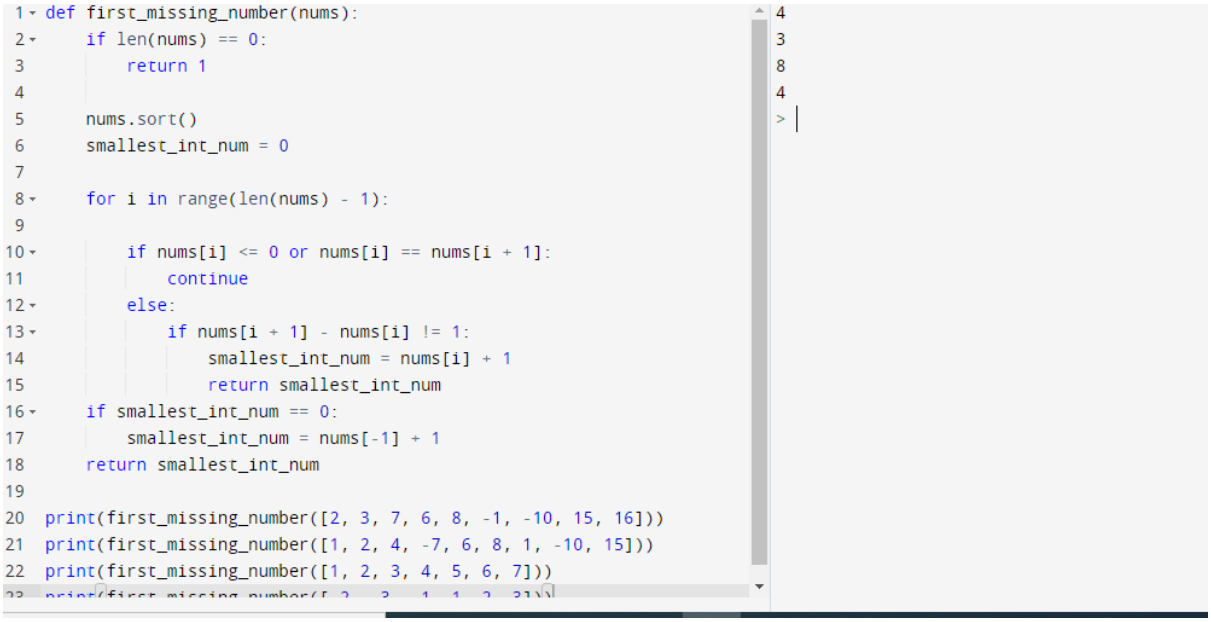
Write a Python program to find the first missing positive integer that does not exist in a given list.
Sample Input:
[2, 3, 7, 6, 8, -1, -10, 15, 16]
[1, 2, 4, -7, 6, 8, 1, -10, 15]
[1, 2, 3, 4, 5, 6, 7]
[-2, -3, -1, 1, 2, 3]

Solution:

```
def first_missing_number(nums):
    if len(nums) == 0:
        return 1

    nums.sort()
    smallest_int_num = 0

    for i in range(len(nums) - 1):

        if nums[i] <= 0 or nums[i] == nums[i + 1]:
            continue
        else:
            if nums[i + 1] - nums[i] != 1:
                smallest_int_num = nums[i] + 1
                return smallest_int_num
    if smallest_int_num == 0:
        smallest_int_num = nums[-1] + 1
    return smallest_int_num

print(first_missing_number([2, 3, 7, 6, 8, -1, -10, 15, 16]))
```

```
print(first_missing_number([1, 2, 4, -7, 6, 8, 1, -10, 15]))
print(first_missing_number([1, 2, 3, 4, 5, 6, 7]))
print(first_missing_number([-2, -3, -1, 1, 2, 3])
```

Output:



```
def first_missing_number(nums):
    if len(nums) == 0:
        return 1

    nums.sort()
    smallest_int_num = 0

    for i in range(len(nums) - 1):

        if nums[i] <= 0 or nums[i] == nums[i + 1]:
            continue
        else:
            if nums[i + 1] - nums[i] != 1:
                smallest_int_num = nums[i] + 1
                return smallest_int_num
    if smallest_int_num == 0:
        smallest_int_num = nums[-1] + 1
    return smallest_int_num

print(first_missing_number([2, 3, 7, 6, 8, -1, -10, 15, 16]))
print(first_missing_number([1, 2, 4, -7, 6, 8, 1, -10, 15]))
print(first_missing_number([1, 2, 3, 4, 5, 6, 7]))
```

```
4
3
8
4
>
```

Question-5:

Write a Python program to randomly generate a list with 10 even numbers between 1 and 100 inclusive.
Note: Use random.sample() to generate a list of random values.

Solution:

```
import random
print(random.sample([i for i in range(1,100) if i%2==0], 10))
```

Output:

main.py

Run

Shell

Clear

```
1 import random
2 print(random.sample([i for i in range(1,100) if i%2==0], 10))
```

```
[66, 74, 76, 38, 68, 52, 30, 64, 90, 58]
>
```

main.py

Run

Shell

Clear

```
1 import random
2 print(random.sample([i for i in range(1,100) if i%2==0], 10))
```

```
[66, 74, 76, 38, 68, 52, 30, 64, 90, 58]
>
```