Module 2: Sequences and File Operations

Case Study I

1. What is the output of the following code?
nums = set([1,1,2,3,3,3,4,4])
print(len(nums))
Hint: Set consists unique element.
4

```
>>> nums = set([1,1,2,3,3,3,4,4]); print(len(nums));print();print(nums)
4

{1, 2, 3, 4}
```

2. What will be the output?
d = {"john":40, "peter":45}
print(list(d.keys()))
Hint: d.keys() is the function which will show keys.
['john', 'peter']

```
>>>
>>> d = {"john":40, "peter":45}
>>> print(list(d.keys()))
['john', 'peter']
>>> print(type(list(d.keys())))
<class 'list'>
>>>
```

3. A website requires a user to input username and password to register. Write a program to check the validity of password given by user. Following are the criteria for checking password:
1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
1. At least 1 letter between [A-Z]
3. At least 1 character from [$#@]
4. Minimum length of transaction password: 6
5. Maximum length of transaction password: 12
Hint: In case of input data being supplied to the question, it should be assumed to be a console input.

```
import re

password = input("Enter your password: ")

if (6 <= len(password) <= 12 and
    re.search("[a-z]", password) and
    re.search("[0-9]", password) and
    re.search("[A-Z]", password) and
    re.search("[$#@]", password)):
    print("Password is valid.")
else:
    print("Password is invalid.")
```

```
[john@squid module2]$
[john@squid module2]$ python3 mod2_3.py
Enter your password: 12345
Password is invalid.
[john@squid module2]$
[john@squid module2]$ python3 mod2_3.py
Enter your password: 123@#QWEr
Password is valid.
[john@squid module2]$
```

4. Write a for loop that prints all elements of a list and their position in the list.
 a = [4,7,3,2,5,9]
Hint: Use Loop to iterate through list elements.

```
>>> a=[4,7,3,2,5,9]
>>> i=0
>>> for e in a:
...     print(f"{i} : {e}")
...     i+=1
...
0 : 4
1 : 7
2 : 3
3 : 2
4 : 5
5 : 9
>>>
```

5. Please write a program which accepts a string from console and print the characters that have even indexes.
 Example: If the following string is given as input to the program:
H1e2l3l4o5w6o7r8l9d
 Then, the output of the program should be:
 Helloworld

```
#!/usr/bin/python3


input_string = input("Enter a string: ")
print(input_string[::2])
```

```
[john@squid module2]$ ./mod2_5.py
Enter a string: H1e2l3l4o5w6o7r8l9d
Helloworld
```

6. Please write a program which accepts a string from console and print it in reverse order.
 Example: If the following string is given as input to the program:
 rise to vote sir
 Then, the output of the program should be:
 ris etov ot esir

```
#!/usr/bin/python3


input_string = input("Enter a string: ")
print(f"Initial string: {input_string}")
print(input_string[::-1])
```

```
[john@squid module2]$ ./mod2_6.py
Enter a string: rise to vote sir
Initial string: rise to vote sir
ris etov ot esir
```

7. Please write a program which count and print the numbers of each character in a string input by console.
 Example: If the following string is given as input to the program:

abcdefgabc
Then, the output of the program should be:
a,2
c,2
b,2
e,1
d,1
g,1
f,1

```python
#!/usr/bin/python3

input_string = input("Enter a string: ")
character_count = {}

for character in input_string:
    if character in character_count:
        character_count[character] += 1
    else:
        character_count[character] = 1

for character, count in character_count.items():
    print(f"{character},{count}")
```

```
[john@squid module2]$ python3 mod2_7.py
Enter a string: abcdefgabc
a,2
b,2
c,2
d,1
e,1
f,1
g,1
[john@squid module2]$
```

8. With two given lists [1,3,6,78,35,55] and [12,24,35,24,88,120,155], write a program to make a list whose elements are intersection of the above given lists

```python
#!/usr/bin/python3

list1 = [1,3,6,78,35,55]
list2 = [12,24,35,24,88,120,155]

intersection = list(set(list1) & set(list2))

print(intersection)
```

9. With a given list [12,24,35,24,88,120,155,88,120,155], write a program to print this list after removing all duplicate values with original order reserved.

```python
#!/usr/bin/python3

input_list = [12,24,35,24,88,120,155,88,120,155]
output_list = []

for item in input_list:
    if item not in output_list:
        output_list.append(item)

print(output_list)
```

```
john@squid module2]$ python3 mod2_9.py
12, 24, 35, 88, 120, 155]
```

10. By using list comprehension, please write a program to print the list after removing the value 24 in [12,24,35,24,88,120,155].

```python
#!/usr/bin/python3

input_list = [12,24,35,24,88,120,155]
output_list = [item for item in input_list if item != 24]

print(output_list)
```

```
[john@squid module2]$ python3 mod2_10.py
[12, 35, 88, 120, 155]
[john@squid module2]$
```

11. By using list comprehension, please write a program to print the list after removing the 0th,4th,5th numbers in [12,24,35,70,88,120,155].

```
#!/usr/bin/python3

input_list = [12,24,35,70,88,120,155]
output_list = [input_list[i] for i in range(len(input_list)) if i not in [0,4,5]]

print(output_list)
```

```
[john@squid module2]$ python3 mod2_11.py
[24, 35, 70, 155]
[john@squid module2]$
```

12.By using list comprehension, please write a program to print the list after removing
delete numbers which are divisible by 5 and 7 in [12,24,35,70,88,120,155].

```
#!/usr/bin/python3

input_list = [12,24,35,70,88,120,155]
output_list = [item for item in input_list if not (item % 5 == 0 and item % 7 == 0)]

print(output_list)
```

```
[john@squid module2]$
[john@squid module2]$ python3 mod2_12.py
[12, 24, 88, 120, 155]
[john@squid module2]$
```

13.Please write a program to randomly generate a list with 5 numbers, which are
divisible by 5 and 7 , between 1 and 1000 inclusive.

```
#!/usr/bin/python3

import random

output_list = [num for num in random.sample(range(1, 1001), 1000) if num % 5 == 0 and num % 7 == 0][:5]

print(output_list)
```

```
[john@squid module2]$
[john@squid module2]$ python3 mod2_13.py
[910, 980, 35, 385, 315]
[john@squid module2]$
```

14.Write a program to compute 1/2+2/3+3/4+...+n/n+1 with a given n input by
console (n>0).

Example:
If the following n is given as input to the program:
5
Then, the output of the program should be:
3.55

```python
n = int(input("Enter a number (n>0): "))
sum_series = sum([i / (i + 1) for i in range(1, n + 1)])

print(f"{sum_series:.2f}")
```

```
[john@squid module2]$
[john@squid module2]$ python3 mod2_14.py
Enter a number (n>0): 5
3.55
[john@squid module2]$
```