String

1. How do you retrieve 5th character of a string "we are learning python"
2. How do you retrieve 'l' char of a string "we are learning python"
3. How do you retrieve 'g' using negative index of a string "we are learning python"
4. str1="we are all learning python"; use the slice operator to retrieve' learning'; Use the slice operator to retrieve 'all' using negative index
5. str2='this is a great learning on python'; use slice operator to retrieve alternate characters; use slice operator to retrieve every 3rd character
6. str3='python is a good scripting language';
   a. observe the response for str3[:]
   b. str3[0:]
   c. str3[:35]
   d. str3
7. Construct an integer from the string "12345".

List

8. Construct a list of integers
9. Construct a list of strings
10. Construct a list of integers and strings
11. Write a code print the length of a list.
12. Write a code to print each item in the list
13. Write a code to append an item to a list.
14. Write a code to insert an item at the beginning of a list.
15. Write a code to insert an item in the middle of a list.
16. Write a code to add two lists together, using both the extend method and the plus (+) operator and note the difference
17. Write a code to retrieve the 4th item from list.
18. Write a code to retrieve the 2nd, 3rd, and 4th items from the list.
19. Write a code to replace an item in a list with a new item.
20. Write a function to append items to an empty list.
21. Implement a stack using list
22. Implement a queue using list
23. Given a list url = [www.annauniv.edu, www.google.com, www.ndtv.com, www.website.org, www.bis.org.in, www.rbi.org.in]; Sort the list based on the top level domain using custom sorting
24. **Exercise :**

    A reputed Paint manufacturing company maintain two lists as below.

    A list of standard colors → Red, Blue and Green

    A list of Color codes → "Talc", 8451, 8953.45 , 10.25 + 5.65j];

    i. print all standard colors, the first color in the std color list

ii. Print standard colors twice.
iii. Concatenate and form a list of standard colors and color codes.
iv. Print from 2nd color code till the end of the color code list.
v. What is the data type of last entry in the color code list ? Print it.

25. Given a list of strings, return the count of the number of strings where the string length is 2 or more and the first and last chars of the string are the same. Note: python does not have a ++ operator, but += works.

```
def match_ends (words):
+++your code here+++
return
```

i. ['aba', 'xyz', 'aa', 'x', 'bbb']
ii. ['', 'x', 'xy', 'xyx', 'xx']
iii. ['aaa', 'be', 'abc', 'hello']

26. Given a list of strings, return a list with the strings in sorted order, except group all the strings that begin with 'x' first. e.g. ['mix', 'xyz', 'apple', 'xanadu', 'aardvark'] yields ['xanadu', 'xyz', 'aardvark', 'apple', 'mix'].
Hint: this can be done by making 2 lists and sorting each of them before combining them.

```
def front_x(words):
+++your code here+++
 Return
```

i. ['bbb', 'ccc', 'axx', 'xzz', 'xaa']
ii. ['mix', 'xyz', 'apple', 'xanadu', 'aardvark']

27. Given a list of non-empty tuples, return a list sorted in increasing order by the last element in each tuple.
e.g. [(1, 7), (1, 3), (3, 4, 5), (2, 2)] yields [(2, 2), (1, 3), (3, 4, 5), (1, 7)]
Hint: use a custom key= function to extract the last element form each tuple.

```
def sort_last(tuples):
+++your code here+++
return
```

i. [(1, 3), (3, 2), (2, 1)]
ii. [(1, 7), (1, 3), (3, 4, 5), (2, 2)]

28. Given a list of numbers, return a list where all adjacent == elements have been reduced to a single element, so [1, 2, 2, 3] returns [1, 2, 3]. You may create a new list or modify the passed in list.

```
def remove_adjacent (nums):
 +++your code here+++
  return
```

29. Given a list of numbers, return a list where all adjacent == elements have been reduced to a single element, so [1, 2, 2, 3] returns [1, 2, 3]. You may create a new list or modify the passed in list.

```
def remove_adjacent(nums):
+++your code here+++
return
```

   i. [1, 2, 2, 3], [2, 2, 3, 3, 3]

Tuple

30. Construct an empty tuple
31. Construct a tuple containing exactly one item
32. Construct a tuple of integers
33. Construct a tuple of strings
34. Construct a list of tuples or tuple of list
35. Write a code to retrieve the 4th item from one a tuple or list
36. Write a code to retrieve the 2nd, 3rd, and 4th items from a tuple or list.

Dictionary

37. A reputed Paint manufacturing company maintains hashing of each color with a color code.
colorbook = {'col6': 'shy iris', 'col7': 'red', 'col4': 'iced silver', 'col5': 'Tear drop', 'col2': 'sugarcane', 'col3': 'Twilight pink', 'col1': 'pink'}
    a. Print only colors
    b. Print only color codes
    c. Print color code mapping to "Red".
    d. Print color given a color code.
    e. Concatenate and form a list of colors and color codes.
    f. Print from 2nd color code till the end of the color code list.
    g. Update the color code of "Tear drop" as col8 and note your observations.

38. How to retrieve the specific values from the given dictionary below

```
dict1= {“stu1":{"maths":200, "science":300},
"stu2":{"maths":400, "English":900, "Science":770},
"stu3":{"maths":600, "English":800, "Science":900}
}
```

a. stu1's science marks

b. stu2's English marks
c. stu3's maths marks

39. Create a dictionary to represent the following table:

```
02/01/2016 11:43 AM <DIR> .
02/01/2016 11:43 AM <DIR> ..
01/13/2016 04:40 PM 3,116 .bash_history
11/25/2015 03:15 PM 71 .dbshell
11/21/2015 12:00 AM 20 .erlang.cookie
12/18/2015 10:13 AM 41 .gitconfig
06/30/2015 04:34 PM <DIR> .groovy
06/13/2015 05:12 PM <DIR> .idlerc
```

40. Create a dictionary to represent the following xml data and retrieve specific values

```
<bookstore shelf="New Arrivals">
<book category="COOKING">
<title lang="en">Everyday Italian</title>
<author>Giada De Laurentiis</author>
<year>2005</year>
<price>30.00</price>
</book>
<book category="CHILDREN">
<title lang="en">Harry Potter</title>
<author>J K. Rowling</author>
<year>2005</year>
<price>29.99</price>
</book>
<book category="WEB">
<title lang="en">Learning XML</title>
<author>Erik T. Ray</author>
<year>2003</year>
<price>39.95</price>
</book>
</bookstore>
```

Sets

```
stdcol = ["red", "green", "yellow", "pink", "brown", "green", "yellow"]
famcol = ["Persian blue", "red", "sugarcane", "talc"]
```

1. Print all standard colors without duplicates.

2. Display each color of std color list in each line.
3. Form a single set of colors from both the lists.
4. Display common colors that exist in both lists.

Files & Functions:

41. Create file one.txt with few lines and write these contents into another file two.txt.
42. Write a module to implement following functions in mymathnew module

    1. Sqroot
    2. Addition
    3. Subtraction
    4. Multiplication
    5. Division

43. Using functions create a simple calculator with add, subtract, multiply and divide functionalities
44. Write a function to accept *args and **kwargs
45. Write a function that implements a rotating counter from 0 to 9. That is, the counter starts at 0, increments to 9, resets to 0 again, and repeats that cycle indefinitely. It should have increment()and reset() functions
46. Write a function to print the information in the dictionary(bookstore) in the below format

    bookstore={"New Arrivals":{"COOKING":["Everyday Italian","Giada De Laurentiis","2005","30.00"],"CHILDREN":["Harry Potter","J K. Rowling","2005","29.99"],"WEB":["Learning XML","Erik T. Ray","2003","39.95"]}}

    BOOKSTORE

1. 'Learning XML', 'Erik T. Ray', '2003', '39.95'
2. 'Everyday Italian', 'Giada De Laurentiis', '2005', '30.00']
3. 'Harry Potter', 'J K. Rowling', '2005', '29.99']

Exception handling

47. Check for the exceptions and handle them:

    a. list1 = 10 * [0]
       list1 [11]
    b. Set ([1, 2, 4, 6, 7])

```
    set1.remove(9)
c. print chr(1024)
d. l=[0,1,2]
    i=iter(l)

print i
print i.next()
print i.next()
print i.next()
print i.next()
```

48. How do you handle exception for the following code:

```
c = 0
def f2(x):
        c+= 1
        b = x + c
print c
return b

print f2(1)
print c
```

49. Handle exception for the following code:

```
def outer():
x = 100
def inner():
x += 1
print(x)
inner()

outer()
```

50. Try to generate the exceptions for lists, dictionaries, sets and show how it can be handled.

51. Check if the following codes throws an error:

```
a. def f1(x):
    z= x + c
    return z
    c = 0
    print f1(1)
    print c
```

b.
```
def f2(x):
    b = x + c
    c += 1
   return b
   c = 0
   print f2(1)
   print c
```

52. Create the following exceptions and blocks to handle them
    a. IoError
    b. IndexError
    c. KeyError
    d. NameError
    e. SyntaxError
    f. TypeError
    g. ValueError
    h. ZeroDivisionError
    i. StopIteration

53. Write a program to read integer and display number is positive or negative

54. Write a program to read age and sex and display the person is eligible to marry

55. Write a program to read an integer and display the number is prime or not

56. Write a program to read an integer and display the number the number of times

57. Write a program to read an integer and display Fibonacci series till the given number

58. Write a program to read number and display the number of digits present in the given number

59. Write a program to read a number until zero is given and display the count of numbers, biggest, smallest, sum of all, sum of even, sum of odd, number of positive and negative numbers

60. Write a program to define function with basic mathematical functionalities like addition, subtraction, multiplication and division

61. Write a program to define function to find power, ceil, log, sin, cos and tan of given numbers using built-in functions

62. Write a function to implement factorial of a given number using recursive functions

63. Write a function which takes list as parameter and maps list of words into a list of integers representing the lengths of the corresponding words

64. Write a Python function that checks whether a passed string is palindrome or not

65. Write a function that takes a list as parameter containing words and returns the length of the longest one

Regular Expressions

66. Translate each of the following English statements into a regular expression:

    a. A digit at the beginning of the string and a digit at the end of the string

        i. \d+[\w]+\d+

    b. A string that contains only whitespace characters or word characters

        i. [a-z A-Z\s]+

    c. A string containing no whitespace characters

        i. [^\s]+

67. Write a program that loops through the lines of a file or standard input (where each line contains a single word) and prints all words containing two adjacent vowels.

    a. \w*[aeiou]{2,}\w*

    b. \b\w[aeiouAEIOU]{2}\w\b

68. Write a program that loops through the lines of a file to match all words with exactly two vowels appearing anywhere within the word.

69. Translate each of the following regular expressions into English:

```
r'hello.*world'
r'^\d+\s\w*$'
r'\b[A-Z][a-z]*\b'
r'(.).*\1'
```

70. Write the regular expression to compile the IP address and use it to search for patterns in source1.txt and source2.txt

71. What is the response of each line of code below

    a. re.split ('\W+', 'Words, words, words.')

    b. re.split ('(\W+)', 'Words, words, words.')

    c. re.split('\W+', 'Words, words, words.', 1)

    d. re.split('[a-f]+', '0a3B9', flags=re.IGNORECASE)

72. Write a pattern to get "ample" from "example"

    a. m=re.search(r"ample",'example')

73. Write a pattern to extract word after ':'

    a. m=re.search(r":[\w]+",str2)

74. Write a code with regular expression for reading the contents from the file and covert the respective characters into uppercase if the character is a/e/i/o/u

75. Given str1= 'my 2 imp numbers are 22 and 88' write a RE to extract the digits

    a. m=re.findall("[\d]+",str1)

76. Given email='From abc.xyz12@pqr.com Mon Dec 29 01:12:15 2014'
    write a RE to extract

    a. email id

    b. domain name

    c. time

    Ans:
    m=re.search(r'([\S]+@([\w]+.com))\s+[\w]+\s+[\w]+\s+[\w]+\s+([\d:]+)\s+[\w]+',email)

77. Given data='one abc@gmial.com two three pqr@xyz.com', write a RE to extract all the email ids.

    a. r'[\w]+@[\w]+.com'

78. Given text="Python is easy to learn" create a RE to extract each word as a group

    a. r"([a-zA-Z]+)\s+([a-zA-Z]+)\s+([a-zA-Z]+)\s+([a-zA-Z]+)\s+([a-zA-Z]+)"