22. Write a program to compute the frequency of the words from the input. The output should output after sorting the key alphanumerically.

**Suppose the input is supplied to the program:**

New to Python or choosing between Python 2 and Python 3? Read Python 2 or Python 3.

**Then, the output should be:**

2:2

3.:1

3?:1

New:1

Python:5

Read:1

and:1

between:1

choosing:1

or:2

to:1

**Hints:** In case of input data being supplied to the question, it should be assumed to be a console input.

23. Write a method which can calculate square value of number

**Hints:** Using the \*\* operator

24. Python has many built-in functions, and if you do not know how to use it, you can read document online or find some books. But Python has a built-in document function for every

built-in functions. Please write a program to print some Python built-in functions documents, such as abs(), int(), raw\_input() And add document for your own function

**Hints:** The built-in document method is \_\_doc\_\_

25. Define a class, which have a class parameter and have a same instance parameter.

**Hints:** Define a instance parameter, need add it in \_\_init\_\_ method

You can init a object with construct parameter or set the value later

26. Define a function which can compute the sum of two numbers.

**Hints:** Define a function with two numbers as arguments. You can compute the sum in the function and return the value.

27. Define a function that can convert a integer into a string and print it in console.

**Hints:** Use str() to convert a number to string.

28. Define a function that can convert a integer into a string and print it in console.

**Hints:** Use str() to convert a number to string.

29. Define a function that can receive two integral numbers in string form and compute their 40. Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print all values except the first 5 elements in the list.

**Hints:** Use \*\* operator to get power of a number. Use range() for loops. Use list.append() to add values into a list. Use [n1:n2] to slice a list sum and then print it in console.

**Hints:** Use int() to convert a string to integer.

30. Define a function that can accept two strings as input and concatenate them and then print it in console.

**Hints:** Use + to concatenate the strings

31. Define a function that can accept two strings as input and print the string with maximum length in console. If two strings have the same length, then the function should print al l strings line by line.

**Hints:** Use len() function to get the length of a string

32. Define a function that can accept an integer number as input and print the "It is an even number" if the number is even, otherwise print "It is an odd number".

**Hints:** Use % operator to check if a number is even or odd.

33. Define a function which can print a dictionary where the keys are numbers between 1 and 3 (both included) and the values are square of keys.

**Hints:** Use dict[key]=value pattern to put entry into a dictionary.

Use \*\* operator to get power of a number.

34. Define a function which can print a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys.

**Hints:** Use dict[key]=value pattern to put entry into a dictionary.

Use \*\* operator to get power of a number. Use range() for loops.

35. Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the values only.

**Hints:** Use dict[key]=value pattern to put entry into a dictionary. Use \*\* operator to get power of a number. Use range() for loops. Use keys() to iterate keys in the dictionary. Also we can use item() to get key/value pairs.

36. Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the keys only.

**Hints:** Use dict[key]=value pattern to put entry into a dictionary. Use \*\* operator to get power of a number. Use range() for loops. Use keys() to iterate keys in the dictionary. Also we can use item() to get key/value pairs.

37. Define a function which can generate and print a list where the values are square of numbers between 1 and 20 (both included).

**Hints:** Use \*\* operator to get power of a number. Use range() for loops. Use list.append() to add values into a list.

38. Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print the first 5 elements in the list.

**Hints:** Use \*\* operator to get power of a number. Use range() for loops. Use list.append() to add values into a list. Use [n1:n2] to slice a list

39. Define a function which can generate a list where the values are square of numbers between 1 and 20 (both included). Then the function needs to print the last 5 elements in the list.

**Hints:** Use \*\* operator to get power of a number. Use range() for loops. Use list.append() to add values into a list. Use [n1:n2] to slice a list

41. Define a function which can generate and print a tuple where the value are square of numbers between 1 and 20 (both included).

**Hints:** Use \*\* operator to get power of a number. Use range() for loops. Use list.append() to add values into a list. Use tuple() to get a tuple from a list.

42. With a given tuple (1,2,3,4,5,6,7,8,9,10), write a program to print the first half values in one line and the last half values in one line.

**Hints:** Use [n1:n2] notation to get a slice from a tuple.

43. Write a program to generate and print another tuple whose values are even numbers in the given tuple (1,2,3,4,5,6,7,8,9,10).

**Hints:** Use "for" to iterate the tuple. Use tuple() to generate a tuple from a list.

44. Write a program which accepts a string as input to print "Yes" if the string is "yes" or "YES" or "Yes", otherwise print "No".

**Hints:** Use if statement to judge condition.

45. Write a program which can filter even numbers in a list by using filter function. The list is: [1,2,3,4,5,6,7,8,9,10].

**Hints:** use filter() to filter some elements in a list. Use lambda to define anonymous functions.

46. Write a program which can map() to make a list whose elements are square of elements in [1,2,3,4,5,6,7,8,9,10].

**Hints:** Use map() to generate a list. Use lambda to define anonymous functions.

47. Write a program which can map() and filter() to make a list whose elements are square of even number in [1,2,3,4,5,6,7,8,9,10].

**Hints:** Use map() to generate a list. Use filter() to filter elements of a list. Use lambda to define anonymous functions.

48. Write a program which can filter() to make a list whose elements are even number between 1 and 20 (both included).

**Hints:** Use filter() to filter elements of a list. Use lambda to define anonymous functions.

49. Write a program which can map() to make a list whose elements are square of numbers between 1 and 20 (both included). 1

**Hints:** Use map() to generate a list. Use lambda to define anonymous functions.

50. Define a class named American which has a static method called printNationality.

**Hints:** Use @staticmethod decorator to define class static method.

51. Define a class named American and its subclass NewYorker.

**Hints:** Use class Subclass(ParentClass) to define a subclass.

52. Define a class named Circle which can be constructed by a radius. The Circle class has a method which can compute the area.

**Hints:** Use def methodName(self) to define a method.

53. Define a class named Rectangle which can be constructed by a length and width. The Rectangle class has a method which can compute the area.

**Hints:** Use def methodName(self) to define a method.

54. Define a class named Shape and its subclass Square. The Square class has an init function which takes a length as argument. Both classes have a area function which can print the area of the shape where Shape's area is 0 by default.

**Hints:** To override a method in super class, we can define a method with the same name in the super class.

55. Write a function to compute 5/0 and use try/except to catch the exceptions.

**Hints:** Use try/except to catch exceptions.

56. Define a custom exception class which takes a string message as attribute.

**Hints:** To define a custom exception, we need to define a class inherited from Exception.

57. Assuming that we have some email addresses in the "username@companyname.com" format, please write program to print the user name of a given email address. Both user names and company names are composed of letters only.

**If the following email address is given as input to the program:** Chandra@gdhdhtc.com

**Then, the output of the program should be:** Chandra

In case of input data being supplied to the question, it should be assumed to be a console input.

**Hints:** Use \w to match letters.

58. Assuming that we have some email addresses in the "username@companyname.com" format, please write program to print the company name of a given email address. Both user names and company names are composed of letters only.

**If the following email address is given as input to the program:** Chandra@analytixlabs.com

**Then, the output of the program should be:** analytixlabs

In case of input data being supplied to the question, it should be assumed to be a console input.

**Hints:** Use \w to match letters

59. Write a program which accepts a sequence of words separated by whitespace as input to print the words composed of digits only.

**If the following words are given as input to the program:** 2 cats and 3 dogs.

**Then, the output of the program should be:** ['2', '3']

In case of input data being supplied to the question, it should be assumed to be a console input.

**Hints:** Use re.findall() to find all substring using regex.

60. Print a unicode string "hello world".

Hints: Use u'strings' format to define unicode string.

61. Write a program to read an ASCII string and to convert it to a unicode string encoded by utf-8.

**Hints:** Use unicode() function to convert.

62. Write a special comment to indicate a Python source code file is in unicode.

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

**If the following n is given as input to the program:** 5

**Then, the output of the program should be:** 3.5

In case of input data being supplied to the question, it should be assumed to be a console input.

**Hints:** Use float() to convert an integer to a float

64.Write a program to compute:

f(n)=f(n-1)+100 when n>0

and f(0)=0

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:

500

65. The Fibonacci sequence is computed based on the following formula:

f(n)=0 if n=0

f(n)=1 if n=1

f(n)=f(n-1)+f(n-2) if n>1

Please write a program to compute the value of f(n) with a given n input by console.

**If the following n is given as input to the program**: 7

**Then, the output of the program should be:** 13

In case of input data being supplied to the question, it should be assumed to be a console input.

**Hints:** We can define recursive function in Python.

66. The Fibonacci sequence is computed based on the following formula:

f(n)=0 if n=0

f(n)=1 if n=1

f(n)=f(n-1)+f(n-2) if n>1

Please write a program using list comprehension to print the Fibonacci sequence in comma separated form with a given n input by console.

**If the following n is given as input to the program:** 7

**Then, the output of the program should be**: 0, 1, 1, 2, 3, 5, 8, 13

**Hints:** We can define recursive function in Python. Use list comprehension to generate a list from an existing list. Use string.join() to join a list of strings. In case of input data being supplied to the question, it should be assumed to be a console input.

67. Please write a program using generator to print the even numbers between 0 and n in comma separated form while n is input by console.

**Example:** If the following n is given as input to the program: 10

Then, the output of the program should be: 0,2,4,6,8,10

**Hints:** Use yield to produce the next value in generator. In case of input data being supplied to the question, it should be assumed to be a console input.

68. Please write a program using generator to print the numbers which can be divisible by 5 and 7 between 0 and n in comma separated form while n is input by console.

**If the following n is given as input to the program:** 100

**Then, the output of the program should be**: 0, 35, 70

**Hints:** Use yield to produce the next value in generator. In case of input data being supplied to the question, it should be assumed to be a console input.

69. Please write assert statements to verify that every number in the list [2,4,6,8] is even.

**Hints:** Use "assert expression" to make assertion.

70. Please write a program which accepts basic mathematic expression from console and print the evaluation result.

**If the following string is given as input to the program:** 35+3

**Then, the output of the program should be:** 38

**Hints:** Use eval() to evaluate an expression.

71. Please write a binary search function which searches an item in a sorted list. The function should return the index of element to be searched in the list.

**Hints:** Use if/elif to deal with conditions.

72. Please write a binary search function which searches an item in a sorted list. The function should return the index of element to be searched in the list.

**Hints:** Use if/elif to deal with conditions.

73. Please generate a random float where the value is between 10 and 100 using Python math module.

**Hints:** Use random.random() to generate a random float in [0,1].

74. Please generate a random float where the value is between 5 and 95 using Python math module.

**Hints:** Use random.random() to generate a random float in [0,1].

75. Please write a program to output a random even number between 0 and 10 inclusive using random module and list comprehension.

**Hints:** Use random.choice() to a random element from a list.

76. Please write a program to output a random number, which is divisible by 5 and 7, between 0 and 10 inclusive using random module and list comprehension.

**Hints:** Use random.choice() to a random element from a list.

77. Please write a program to generate a list with 5 random numbers between 100 and 200 inclusive.

**Hints:** Use random.sample() to generate a list of random values.

78. Please write a program to randomly generate a list with 5 even numbers between 100 and 200 inclusive.

**Hints:** Use random.sample() to generate a list of random values.

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

**Hints:** Use random.sample() to generate a list of random values.

80. Please write a program to randomly print a integer number between 7 and 15 inclusive.

**Hints:** Use random.randrange() to a random integer in a given range.

81. Please write a program to compress and decompress the string "hello world!hello world!hello world!hello world!".

**Hints:** Use zlib.compress() and zlib.decompress() to compress and decompress a string.

82. Please write a program to print the running time of execution of "1+1" for 100 times.

**Hints:** Use timeit() function to measure the running time.

83. Please write a program to shuffle and print the list [3,6,7,8].

**Hints:** Use shuffle() function to shuffle a list.

84. Please write a program to shuffle and print the list [3,6,7,8].

**Hints:** Use shuffle() function to shuffle a list.

85. Please write a program to generate all sentences where subject is in ["I", "You"] and verb is in ["Play", "Love"] and the object is in ["Hockey","Football"].

**Hints:** Use list[index] notation to get a element from a list.

86. Please write a program to print the list after removing delete even numbers in [5,6,77,45,22,12,24].

**Hints:** Use list comprehension to delete a bunch of element from a list.

87. 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].

**Hints:** Use list comprehension to delete a bunch of element from a list.

88. By using list comprehension, please write a program to print the list after removing the 0th, 2nd, 4th,6th numbers in [12,24,35,70,88,120,155].

**Hints:** Use list comprehension to delete a bunch of element from a list. Use enumerate() to get (index, value) tuple.

89. By using list comprehension, please write a program generate a 3\*5\*8 3D array whose each element is 0.

**Hints:** Use list comprehension to make an array.

90. 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].

**Hints:** Use list comprehension to delete a bunch of element from a list. Use enumerate() to get (index, value) tuple.

91. 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].

**Hints:** Use list's remove method to delete a value.

92. 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.

**Hints:** Use set() and "&=" to do set intersection operation.

93. 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.

**Hints:** Use set() to store a number of values without duplicate.

94. Define a class Person and its two child classes: Male and Female. All classes have a method "getGender" which can print "Male" for Male class and "Female" for Female class.

**Hints:** Use Subclass(Parentclass) to define a child class.

95. Please write a program which count and print the numbers of each character in a string input by console.

**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

**Hints:** Use dict to store key/value pairs. Use dict.get() method to lookup a key with default value.

96 Please write a program which accepts a string from console and print it in reverse order.

**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

**Hints**: Use list[::-1] to iterate a list in a reverse order.

97. Please write a program which accepts a string from console and print the characters that have even indexes.

**If the following string is given as input to the program:** H1e2l3l4o5w6o7r8l9d

**Then, the output of the program should be:** Helloworld

**Hints:** Use list[::2] to iterate a list by step 2.

98. Please write a program which prints all permutations of [1, 2, 3]

**Hints:** Use itertools.permutations() to get permutations of list.

99. Write a program to solve a classic ancient Chinese puzzle:

We count 35 heads and 94 legs among the chickens and rabbits in a farm. How many rabbits and how many chickens do we have?

**Hint:** Use for loop to iterate all possible solutions

100. Create a dictionary with phone numbers (phonebook = {“John”: 938477566, "Jack”: 938377264, "Jill”: 947662781}). Add "Jake" to the phonebook with the phone number 938273443, and remove Jill from the phonebook.