Module – 2 (Fundamentals of python)  
Q1) Write a Python program to check if a number is positive, negative or zero.

Q2) Write a Python program to get the Factorial number of given number.  
Q3) Write a Python program to get the Fibonacci series of given range.

Q4) How memory is managed in Python?

ANS: According to the Python memory management documentation, Python has a private heap that stores our program’s objects and data structures. Python memory manager takes care of the bulk of the memory management work and allows us to concentrate on our code.

**Types of memory allocation**

There are two types of memory allocation in Python, static and dynamic.

**1. Static memory**

The stack data structure provides **static memory allocation**, meaning the variables are in the stack memory. Statically assigned variables, as the name implies, are permanent; this means that they must be allocated in advance and persist for the duration of the program. Another point to remember is that we cannot reuse the memory allocated in the stack memory. Therefore, memory reusability is not possible.

#### 2. Dynamic memory

The **dynamic memory allocation** uses heap data structures in its implementation, implying that variables are in the heap memory. As the name suggests, dynamically allocated variables are not permanent and can be changed while a program is running. Additionally, allotted memory can be relinquished and reused. However, it takes longer to complete because dynamic memory allocation occurs during program execution. Furthermore, after utilizing the allocated memory, we must release it. Otherwise, problems such as memory leaks might arise.

### Python garbage collection

The Python garbage collector handles memory allocation and deallocation automatically in Python. Python developers have designed it to eliminate the need for manual garbage collection. **Garbage collection** in Python refers to the interpreter’s memory management process of freeing up unneeded and undesired memory for our applications.

The **garbage collector (GC)** operates in the background and is triggered when the reference count reaches zero.

The reference count rises when the following occur:

* An object is given a new name
* An object is placed in a container, such as a tuple or a dictionary

The reference count lowers when the following occurs:

* An object’s reference is reassigned
* An object’s reference moves out of scope
* An object is removed

The memory is a heap that stores the program’s objects and other data structures. The Python memory manager uses API methods to handle the allocation and deallocation of this heap space.

Q5) What is the purpose continue statement in python?

ANS: The continue keyword is used **to end the current iteration in a for loop (or a while loop), and continues to the next iteration**.  
Q6) Write python program that swap two number with temp variable and  
without temp variable.  
Q7)Write a Python program to find whether a given number is even or odd, print out an appropriate message to the user.  
Q8) Write a Python program to test whether a passed letter is a vowel or not.  
Q9) Write a Python program to sum of three given integers. However, if  
two values are equal sum will be zero.

Q10) Write a Python program that will return true if the two given integer values are equal or their sum or difference is 5.  
• Write a python program to sum of the first n positive integers.  
• Write a Python program to calculate the length of a string.  
• Write a Python program to count the number of characters (character  
frequency) in a string  
• What are negative indexes and why are they used?

ANS: Negative Indexing is **used to in Python to begin slicing from the end of the string i.e. the last**. Slicing in Python gets a sub-string from a string.  
• Write a Python program to count occurrences of a substring in a string.  
• Write a Python program to count the occurrences of each word in a  
given sentence

• Write a Python program to get a single string from two given strings,  
separated by a space and swap the first two characters of each string.  
• Write a Python program to add 'ing' at the end of a given string (length  
should be at least 3). If the given string already ends with 'ing' then add  
'ly' instead if the string length of the given string is less than 3, leave it  
unchanged.  
• Write a Python program to find the first appearance of the substring  
'not' and 'poor' from a given string, if 'not' follows the 'poor', replace the  
whole 'not'...'poor' substring with 'good'. Return the resulting string.  
• Write a Python function that takes a list of words and returns the length  
of the longest one.  
• Write a Python function to reverses a string if its length is a multiple of  
4.  
• Write a Python program to get a string made of the first 2 and the last  
2 chars from a given a string. If the string length is less than 2, return  
instead of the empty string.  
• Write a Python function to insert a string in the middle of a s