

SAINIK SCHOOL CHANDRAPUR  
HOLIDAY HOMEWORK 2023-24

**Assignment 1**

**CLASS-XII**

**SUBJECT- COMPUTER SCIENCE**

**IMPORTANT INSTRUCTIONS:**

1. Cadets will have to solve the given problems in the sheet on ruled pages / 100 Pages notebook.
2. Cadets will submit the solved sheets to respective subject teacher within 2 days of their reporting.
3. Internal marks for the final exam will be calculated only on the basis of submission of this work.

	Revision Tour of Python	
1.	Write a Python program to calculate the length of a string.	
2.	Write a Python program to count the number of characters (character frequency) in a string. Sample String: 'google.com' Expected Result: {'g': 2, 'o': 3, 'l': 1, 'e': 1, '.': 1, 'c': 1, 'm': 1}	
3.	Write a Python program to get a string from a given string where all occurrences of its first char have been changed to '\$', except the first char itself. Sample String: 'restart' Expected Result: 'resta\$t'	
4.	Write a Python program to remove the nth index character from a nonempty string.	
5.	Write a Python program that accepts a comma separated sequence of words as input and prints the unique words in sorted form (alphanumerically). Sample Words: red, white, black, red, green, black Expected Result: black, green, red, white, red	
6.	Write a Python function to get a string made of its first three characters of a specified string. If the length of the string is less than 3, then return the original string. Sample function and result: first_three('ipy') -> ipy first_three('python') -> pyt	
7.	Write a Python program to check whether a string starts with specified characters. Note: In cryptography, a Caesar cipher, also known as Caesar's cipher, the shift cipher, Caesar's code or Caesar shift, is one of the simplest and most widely known encryption techniques. It is a type of substitution cipher in which each letter in the plaintext is replaced by a letter some fixed number of positions down the alphabet. For example, with a left shift of 3, D would be replaced by A, E would become B, and so on. The method is named after Julius Caesar, who used it in his private correspondence.	
8.	Write a Python program to print the following floating numbers with no decimal places.	

9.	Write a Python program to print the index of the character in a string. Sample string: Python Program Expected output: Current character P position at 0 Current character y position at 1 Current character t position at 2	
10.	Write a Python program to count and display the vowels of a given text.	
11.	Write a Python program to sum all the items in a list.	
12.	Write a Python program to get the largest number from a list.	
13.	Write a Python program to remove duplicates from a list. a = [10,20,30,20,10,50,60,40,80,50,40]	
14.	Write a Python function that takes two lists and returns True if they have at least one common member.	
15.	Write a Python program to shuffle and print a specified list.	
16.	Write a Python program to count the number of elements in a list within a specified range.	
17.	Write a Python program to generate groups of five consecutive numbers in a list.	
18.	Write a Python program to replace the last element in a list with another list. Sample data: [1, 3, 5, 7, 9, 10], [2, 4, 6, 8] Expected Output: [1, 3, 5, 7, 9, 2, 4, 6, 8]	
19.	Write a Python program to create a dictionary from two lists without losing duplicate values. Sample data: ['Class-V', 'Class-VI', 'Class-VII', 'Class-VIII'], [1, 2, 2, 3] Expected Output: defaultdict(<class 'set'>, {'Class-V':{1}, 'Class-VI':{2}, 'Class-VII':{2}, 'Class- VIII':{3}})	
20.	Write a Python program to iterate over dictionaries using for loops.	
	<b>Functions</b>	
21.	Write a Python function to find the maximum of three numbers.	
22.	Write a Python function to sum all the numbers in a list. Sample List: (4, 6, 3, 5, 6) Expected Output: 24	
23.	Write a Python function to reverse a string. Sample String: "python123" Expected Output: "321nohtyp"	
24.	Write a Python function that accepts a string and calculates the number of uppercase letters and lowercase letters. Sample String: PythonProgramminG Expected Output: Original String: Python Programming No. of Uppercase characters: 3 No. of Lowercase characters: 14	
25.	Write a Python program to print the even numbers from a given list. Sample List: [1, 2, 3, 4, 5, 6, 7,	

	8, 9] Expected Result: [2, 4, 6, 8]	
26.	<p>Write a Python function to check whether a number is perfect or not.</p> <p>According to Wikipedia, in number theory, a perfect number is a positive integer that is equal to the sum of its proper positive divisors, that is, the sum of its positive divisors excluding the number itself (also known as its aliquot sum). Equivalently, a perfect number is a number that is half the sum of all of its positive divisors (including itself). Example: The first perfect number is 6, because 1, 2, and 3 are its proper positive divisors, and <math>1 + 2 + 3 = 6</math>. Equivalently, the number 6 is equal to half the sum of all its positive divisors: <math>(1 + 2 + 3 + 6) / 2 = 6</math>. The next perfect number is 28 <math>= 1 + 2 + 4 + 7 + 14</math>. This is followed by the perfect numbers 496 and 8128.</p>	
27.	<p>22. Write a Python function that prints the first n rows of Pascal's triangle. Note: Pascal's triangle is an arithmetic and geometric figure first imagined by Blaise Pascal.</p> <pre>       1      1 1     1 2 1    1 3 3 1   1 4 6 4 1 </pre> <p>Sample Pascal's triangle: Each number is the two numbers above it added together.</p>	
28.	Write a Python program to make a chain of function decorators (bold, italic, underline, etc.) in Python.	
29.	Write a Python program to access a function inside a function.	
30.	Write recursive code to compute and print sum of squares of n numbers. Value of n is passed as parameter.	
31.	Write recursive code to compute the greatest common divisor of two numbers.	
32.	<p>Create a module lengthconversion.py that stores functions for various lengths conversions, e.g.,</p> <ul style="list-style-type: none"> <li>• Miletokm() to convert miles into kilometres</li> <li>• Kmtomile() to convert kilometres into miles</li> <li>• Feettoinches()</li> <li>• Inchestofoot()</li> </ul> <p>It should also store constant values such as value of (mile in kilometre and vice versa) [1 mile = 1.609344 kilometre; 1 feet = 12 inches] Help() function should display proper information.</p>	
33.	<p>Create a module MassConversion.py that stores function for mass conversion, e.g.,</p> <ul style="list-style-type: none"> <li>• Kgtotonne() to convert kg into tonnes</li> <li>• Tonnetokg() to convert tonne into kg</li> <li>• Kgtopound() to convert kg into pound</li> <li>• Poundtokg() to convert pound into kg (</li> </ul> <p>Also store constants 1 kg = 0.001 tonne, 1 kg = 2.20462 pound) Help () function should give proper information about the module.</p>	
	<b>Using Python Library</b>	

34.	Write a method in Python to find and display the prime numbers between 2 to N. Pass N as argument to the method.	
35.	Write definition of a method ZeroEnding(SCORES) to add all those values in the list of SCORES, which are ending with zero (0) and display the sum. [Delhi 2018] For example, If the SCORES contain [200,456,300,100,234,678] The sum should be displayed as 600	
	<b>Data File Handling</b>	
36.	Write a function file_long() that accepts a filename and reports the file's longest line.	
37.	Write a function remove_lowercase() that accepts two file names, and copies all lines that do not start with a lower case letter from the first file to the second file.	
38.	Write a method in Python to write multiple lines of text contents into a text file daynote.txt line.	
39.	Write a user-defined function in Python that displays the number of lines starting with 'H' in the file Para.txt. Example, if the file contains: Whose woods these are I think I know. His house is in the village though. He will not see me stopping here. To watch his woods, fill up with snow. Then the line count should be 2.	
40.	Consider a binary file Employee.dat containing details such as empno: ename: salary (separator ':'). Write a Python function to display details of those employees who are earning between 20000 and 40000 (both values inclusive).	
41.	Write a function countrmy() in Python to read the text file "DATA.TXT" and count the number of times "my" occurs in the file. For example, if the file "DATA.TXT" contains— "This is my website. I have displayed my preferences in the CHOICE section." —the countrmy() function should display the output as: "my occurs 2 times".	
42.	Write a method in Python to read lines from a text file DIARY.TXT and display those lines which start with the alphabet 'P'.	
43.	Write definition of a method MSEARCH(STATES) to display all the state names from a list of STATES which start with the alphabet M. For example: If the list STATES contains ["MP","UP","WB","TN","MH","MZ","DL","BH","RJ","HR"] The following should get displayed: MP MH MZ	
44.	Write a method in Python to read lines from a text file MYNOTES.TXT and display those lines which start with the alphabet 'K'.	
45.	Write a program using Dictionary and Text files to store roman numbers and find their equivalents.	

46.	Write a program to display all the records in a file along with line/record number.	
47.	Write a program that copies a text file “source.txt” onto “target.txt” barring the lines starting with a “@” sign.	
48.	<p>Write a menu-driven program to perform read and write operations using a text file called “student.txt” containing student roll_no, name and address using two separate functions as given below:</p> <ul style="list-style-type: none"> <li>• student_record(filename)—Entering student details While writing to a file (student.txt), the roll_no field will be separated from the remaining fields with a comma operator.</li> <li>• student_readdata(filename)—Display student details</li> <li>• student_search(filename)—Search a student on the basis of roll_no</li> </ul>	
49.	Write a method/function DISPLAYWORDS () in Python to read lines from a text file POEM.TXT and display those words which are less than 4 characters.	