Programming in Python (CSE 3142)
MINOR ASSIGNMENT-8: RECURSION

1. Write a recursive function that converts a number inputted in string form to an integer type. For example, if input string is: '1234' then the recursive function should convert it to 1234(int type).
2. Write a recursive function to print the sum of the digits of a given non-negative integer.
3. Write a recursive function to calculate the value of 'a' to the power 'b'. For example, if a=2 and b=3, the output should be 2**3 = 8.
4. Write a recursive function to calculate the harmonic sum of first n terms. Note: The harmonic sum is the sum of reciprocals of the positive integers. For example, if n = 4, the output should be (1+1/2+1/3+1/4) = 2.0833
5. Write a recursive function to calculate the geometric sum of first n terms with constant ration r, where r lies in the interval (0,1). Note: In mathematics, a geometric series is a series with a constant ratio between successive terms. For example, if n = 4 and r = (1/2) then output should be (1+1/2+1/4+ 1/8) = 1.875
6. Write a recursive function to calculate the sum of the positive integers of n+(n-2)+(n-4)... (until $n - x \leq 0$). For example, if n=6, then output should be 6+(6-2)+(6-4)+(6-6) = 12
7. Write a recursive function to print the sums of all the subsets of a given array. For Example: Input: lst = [2,3] Output:0, 2,3,5. Input: lst = [2,4,5] Output:0,2,4,5,6,7,9,11.
8. Write a recursive function to check whether a given number is prime or not.
9. Write a recursive function that multiplies two positive numbers a and b, and returns the result. Multiplication is to be achieved as a + a + a (b times).
10. Write a recursive function that takes number n as an input parameter and prints n-digit strictly increasing numbers.
11. Write a recursive function that generates all binary strings of n-bit length.
12. Write a recursive function that takes two strings as input parameters and prints all interleaving strings of the given two strings preserving their order of occurrence. For example, interleaving of strings 'AB' and 'CD' will generate the strings: 'ABCD', 'ACBD', 'ACDB', 'CDAB', 'CADB' and 'CABD'.

13. Write a recursive function that inserts the element x at every kth position in the given list, and returns the modified list. For example, if we wish to insert element 50 at every 3rd position (counting 0, 1, 2, 3) in the list [1, 2, 3, 4, 5, 6, 7], the output list will be [1, 2, 3, 50, 4, 5, 6, 50, 7]. ’

14. Write a recursive function that deletes every kth element, and returns the modified list. For example, if we wish to delete every 3rd element from the list [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11], the output list will be [1, 2, 4, 5, 7, 8, 10, 11].

15. Write a recursive function that recursively removes adjacent duplicates from a given list, and returns the modified list. For example, removing adjacent duplicates recursively from the list [1, 2, 4, 4, 5, 7, 7, 7, 8, 8, 9, 7] will yield list [1, 2, 5, 9, 7].

16. Write a recursive function that takes two numbers as input parameters and computes their greatest common divisor.