Assignment 3 – Functions

1. Take N (number in binary format). Write a function that converts it to decimal format. Print the value returned.
2. Take N (number in decimal format). Write a function that converts it to octal format. Print the value returned.
3. Take N (number in octal format). Write a function that converts it to binary format. Print the value returned.
4. Take sb (source number system base), db (destination number system base) and sn (number in source format). Write a function that converts sn to its counterpart in destination number system. Print the value returned.
5. Take as input the following
    a. Minimum Fahrenheit value
    b. Maximum Fahrenheit value
    c. Step

    Print as output the Celsius conversions. Use the formula C = (5/9)(F – 32)
    e.g. for an input of 0, 100 and 20 the output is

    0 -17

    20 -6

    40 4

    60 15

    80 26

    100 37

6. Take as input the following
    a. A number
    b. A digit

    Write a function that returns the number of times digit is found in the number. Print the value returned.
7. Take as input a number. Assume that for a number of n digits, the value of each digit is from 1 to n and is unique. E.g. 32145 is a valid input number.
    Write a function that returns its inverse, where inverse is defined as follows
    Inverse of 32145 is 12543. In 32145, "5" is at 1st place, therefore in 12543, "1" is at 5th place; in 32145, "4" is at 2nd place, therefore in 12543, "2" is at 4th place.
    Print the value returned.
8. Take as input a number. Assume that for a number of n digits, the value of each digit is from 1 to n and is unique. E.g. 32145 is a valid input number.

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A number is called mirror-inverse if its inverse is equal to itself, where inverse is defined as follows
Inverse of 32145 is 12543. In 32145, "5" is at 1st place, therefore in 12543, "1" is at 5th place; in 32145, "4" is at 2nd place, therefore in 12543, "2" is at 4th place.
Write a function which returns true if the number is mirror-inverse and false otherwise. Print the value returned.

9. Take as input a number. Write a functions which returns true if the number is Armstrong number and false otherwise. Print the value returned.
   An Armstrong number is defined as follows
   E.g. 371 is an Armstrong number as $371 = 3^3 + 7^3 + 1^3$
10. Take as input two numbers N1 and N2. Write a function to print all Armstrong numbers between N1 and N2.
11. Take as input two numbers N1 and N2. Write a function which calculates and returns the GCD of two numbers. Print the value returned.
12. Take as input two numbers N1 and N2. Write a function which calculates and returns the LCM of two numbers. Print the value returned.
13. Take as input two numbers x and n. Write a function which calculates and returns the x^n. Print the value returned.
14. Take as input two numbers x and n. Write a function which calculates and returns the $Log_n(x)$ of two numbers. Print the value returned. Assume that values of x and n are such that the result is going to be a whole number.
15. Take as input two numbers N1 and N2. Write a function which prints first N1 terms of the series 3n + 2 which are not multiples of N2.
16. Take as input a number N. Write a function which returns the integral part of square root of the number. Print the value returned.
17. Take as input a number N and P. Write a function which returns the square root of N correct to precision P. Print the value returned.
18. Take as input a character ch. Write a function that returns 'U', if it is uppercase; 'L' if it is lowercase and 'I' otherwise. Print the value returned.
19. Take as input a number N. Following this take N more inputs from the number to form a sequence S = s1, s2, .., sN. Compute if it is possible to split sequence into two sequences s1 to si and si+1 to sN such that first sequence is strictly decreasing and second is strictly increasing. Print true/false as output.
20. Write a program that works as a simple calculator. It reads two integers and a character.
    a. If the character is +, the sum is printed.
    b. If it is -, the difference is printed.
    c. If it is *, the product is printed.

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d. If it is /, the quotient is printed.
e. If it is %, the remainder is printed.
f. If the user enters 'X' or 'x', the program exits otherwise again asks for two numbers and a new operation.

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