CSE 115 – Programming Language I
Fall 2020
Mid Term 1, Mark – 30, Section 7

Answer any six out of seven questions. Each question has 5 points.

1. Write a program in C to print the sum of the following series:
   1 + 1/3 + 1/9 + 1/27 + 1/81 + ... + 1/X
   where, 1/X is the nth term of the series you take input from user input. Compute the summation and print the result.

   Sample input:
   n = 5
   Sample output:
   Sum = 1.49382716

2. Write a program that will take two arrays as input from users. Later your program needs to merge those arrays.

   Sample input
   array1: 1, 3, 5, 7, 9
   array2: 2, 4, 6, 8
   Sample output
   Merged array: 1, 3, 5, 7, 9, 2, 4, 6, 8

3. Write a program in C that can print a hollow square like the one showing in the following picture, taking the dimension from user input.

   Sample input:
   6
   Sample output:

   ```
   * * * * * *
   *         *
   *         *
   *         *
   *         *
   * * * * * *
   ```

4. Write a program in C to print the second largest element in a given array and also prints the index of that element in the array. (There could be multiple occurrences of that value, so print the respective multiple instances)

   Sample input:
   2, 9, 4, 9, 10, 8, 1
   Sample Output:
   Second largest value found: 9
   Occurs in index: 1, 3

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5. Write a program to find sum of the following series
   Sum = 1/x + 2/(1+2+x) + 3/(1+2+3+x) + …… + n/(1+2+3+..+n+x)
   Where the value of x and n will be given as user input.

6. Write a program to convert a decimal number to binary number.

   Sample Input:
   Decimal number: 23
   Sample output:
   Binary number: 10111

7. Write a C code to print all the prime numbers within a given range taken from user input. FYI: A prime number is that number which is only divisible by 1 and the number itself.

   Sample input:
   upper range: 89
   lower range: 23
   sample output:
   Prime Numbers within the range are: 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89