North South University MIDTERM ID: _____
Summer, 2021 Total: 50 Date: August 29, 2021

The students are requested to read the question paper thoroughly and ask questions before the exam starts. The allocated points for each questions are provided on the left. The students are to **answer 5 the questions out of 6**. The submission method will be explained before the exam starts.

1. **(10 pts)** Take 'n' character inputs from the user and store them in an array. Now. write a function to remove all the alphabet from the string which comes after 'l' and print the result.
   Sample Input: [n,o,r,t,h,s,o,u,t,h]
   Sample Output: [h,h]

2. **(10 pts)** Write a function to create a palindrome of a given number. Print the palindrome of last 5 digit of your NSU ID.
   Sample Input: 92042
   Sample Output: 9204224029

3. **(10 pts)** Write some codes to find the matrix 2*A-B and print the solution in a matrix form.
   Sample Input: $2\begin{bmatrix}1 & 2 & 3\\ 8 & 5 & 6\\ 25 & -6 & -14\end{bmatrix} - \begin{bmatrix}2 & 4 & 6\\ 8 & 1 & 12\\ 10 & -12 & 7\end{bmatrix}$ **Sample Output:** $\begin{bmatrix}0 & 0 & 0\\ -8 & 9 & 0\\ 40 & 0 & -35\end{bmatrix}$

4. **(10 pts)** Study the following sequence $3, 1, 3, 7, 11, 21, 39, 71, 131, 241, 443, 815, ...$
   In mathematical terms, the sequence T_n is defined as follows:

   $$T_{n+3} = T_n + T_{n+1} + T_{n+2} \; for \; n >= 0.$$

   with initial values,

   $$T_0 = 3, T_1 = 1, T_2 = 3,$$

   Now take an integer input n from the user and print the sequence up to n. Use array for this problem.

5. **(10 pts)** Study the following sequence

   $$\frac{1}{1!} + \frac{2}{2!} + \frac{3}{3!} + ... + \frac{n}{n!}$$

   Now, print the summation of the given series up to n^{th} term.

6. **(10 pts)** Take an array of size n from the user. Now, perform a right-shift on the array by 3 and print the array. Example: $[1, 2, 3, 4, 5, 6](input) \rightarrow [4, 5, 6, 1, 2, 3](output)$

7. **(5 pts)** Print the Fibonacci series up to n^{th} term. Use recursion for this problem.[BONUS]