# RIPHAH INTERNATIONAL UNIVERSITY, LAHORE CAMPUS.

RIPHAH SCHOOL OF COMPUTING & INNOVATION (RSCI)



# COMPLEX PROBLEM SOLVING

Issue Date: 22-10-2022 Due Date: 28-10-2022 Semester: FALL 2022 Class: BSCS (7A) Total Marks: 100

# **ASSIGNMENT 01**

# **Objectives:**

Practice on problem solving.

# **Instructions:**

- Assignment type is individual, so no sharing is allowed.
- You can use internet and books as helping resources but sharing content with peers is strictly prohibited.
- Plagiarized assignments will get zero and may fail the course.
- I am available for your help/guidance.
- Start early!

#### **Submission Method:**

- Write everything in word file. You can also solve on paper and attach pictures in word file.
- Submit only MS Word or PDF file at this link.

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#### Problem A2-1

Given the array of size 4, containing a four-digit number. Each digit in a number is stored on a single index of array. You are required to add 1 in array

# Example1:

Input: 2512 is a single number which is stored in an array

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2	5	1	2

Output: 1 is added in 2512 (2512+1=2513)

				1	
2 5 1 3	3	1	5	2	

# Example 2:

Input: 8999 is a single number which is stored in an array

Output: 1 is added in 8999 (8999+1=9000)

#### ALGORITHM:-

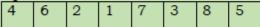
- Start
- Take an array of four indexes and store a value.
- Now start parsing the given array from the end.
- If last element = 9 make it 0 and carry = 1.
- Check carry for the following iteration, and if it adds up to 10.
- repeat step 2
- make carry = 0 for next iteration
- if the number is added change the index value and move forward
- Do the same for all array
- end

#### Problem A2-2

The heights of different peaks at a mountain are given in the array. Each element of array shows the peak height. A climber has some superpowers and can directly jump from one peak to another peak. Your task is to find the maximum jump that a climber made during his journey.

#### For Example:

Input:



#### Output:

6

#### Explanation:

The maximum jump made is from '1' to '7' elements which is 6.

# ALGORITHM:

- start
- take an array of 0 to 7 indexes
- start loop to compare all elements of the array
- declare a variable Jump
- compare the first two indexes and store the max value index number in the jump
- then compare the 3<sup>rd</sup> index with the jump
- if the 3<sup>rd</sup> index Is greater the jump, then replace the value
- do this for all the array
- print the highest index number.
- End

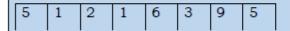
# Problem A3-3

Given the array of size n, find the Majority Element from the array. Return -1 if there is no any majority element.

Majority element is an element that exist more than half of the size of array.

# Example 1:

# Input:



#### Output:

-1

# Explanation:

There is no any element that exists more than half of the array. So answer is -1.

# Algorithm:

- Start
- Take a variable to store the maximum count.
- Traverse the array from start to end.
- Run another loop to find similar values in the array.
- If arr[i] = max count
- Update the maximum count and save the index in a different variable if the count exceeds the maximum count.
- Print the element if the maximum count is greater then half of array
- Otherwise print -1.