National University of Computer and Emerging Sciences, Lahore Campus

Course:	**PF (Lab)**	**Course Code:**	**CL 118**
Program:	**BS (Computer Science)**	**Semester:**	**Fall 2019**
Duration:	**2 Hours**	**Total Marks:**	**60 (20+20+20)**
Paper Date:	**17-Oct-2019**	**Weight**	**30%**
Section:	**A,B,G,H,I,J**	**Page(s):**	**1**
Exam:	**Midterm Exam**	**Reg. No**	

Important Instructions (Please read them before attempting the exam):

- Submit **ONLY .cpp File** in this format (Make the File **named** with your **Roll Number** e.g., L19-4152).
- **Plagiarism** will result in **F grade** in lab.
- No cell phones are allowed. Sharing of **USBs** or any other items is **not allowed.**
- Submission path will be announced soon.
- Necessary files are placed on **\\cactus\Xeon\Fall 2019\Shakeel Zafar\PF MID Exam**
- Use **Visual Studio 2012.**

Question # 1:

You are asked to write a c++ program in which a user wants to convert the binary numbers to decimal. The user should be allowed input the digits of binary in reversed order. The input will terminate on -1. The -1 will not be the part of binary input. Finally, you have to print the decimal number.

Input: Enter the binary digit 0: 0
Enter the binary digit 1: 1
Enter the binary digit 2: 0
Enter the binary digit 3: 1
Enter the binary digit 4: -1

Output: The decimal number is: 10

For this given sample example, see the binary digits are in reversed order like 0101. The actual binary should be 1010 and its equivalent decimal number is 10.

Question # 2:

Write a c++ program to input number from user and check number is palindrome or not, using loop. *Palindrome number* is such number which, when reversed is equal to the original number.

Input: Input any number: 121

Output: 121 is palindrome

Furthermore, to make question easy, your c++ program must cater another condition. The condition is; a palindrome number can have leading 0's and trailing 0's. e.g the numbers 000111000, 12321000, 0011 are palindrome numbers.

Question # 3:

You are asked to write a c++ program in which a user enter a series of numbers and this input will end on -9999. User wants to know that the series which he has given input is Arithmetic series, Geometric series or Fibonacci series. The program will have at least three valid values as input. Your program will check on every pair of consecutive values whether the pair follow rules for any of above-mentioned series or not. At the end of input, you will mention that these numbers belong to which series. Or you will say these numbers do not belong to any of these series.

Rules for Arithmetic series:	Rules for Geometric series:	Rules for Fibonacci series:
$a_n=a_1+(n-1)d$ a_n=the n^{th} term in the sequence a_1=the first term in the sequence d=the common difference between terms So, if the difference between any pair of values is not same as the first pair had, then this series is not arithmetic.	$a_n=a_1r^{n-1}$ a_n=the n^{th} term in the sequence a_1=the first term in the sequence r=the common ratio between terms So, if the ratio between any pair of values is not same as the first pair had, then this series is not geometric.	$a_n = a_{n-1} + a_{n-2}$ a_n=the n^{th} term in the sequence a_{n-1}=the first previous term in the sequence from nth term a_{n-2}= the second previous term in the sequence from nth term So, if this rule is violated for any pair, then this series is not Fibonacci.

Input:	Enter the values of series:	-11	2	15	28	-9999
Output:	The series is arithmetic					
Input:	Enter the values of series:	-4	-16	-64	-256	-9999
Output:	The series is geometric					
Input:	Enter the values of series:	1	1	2	3	-9999
Output:	The series is Fibonacci					
Input:	Enter the values of series:	1	4	3	43	-9999
Output:	This not a series					