National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	**Programming Fundamentals**	**Course Code:**	**CS 118**
	Program:	**BS(CS)**	**Semester:**	**Spring 2019**
	Duration:	**2 hr**	**Total Points:**	**50**
	Paper Date:	**March, 22nd 2019**	**Weight**	**25**
	Section:	**G,H,I**	**Page(s):**	**2**
	Exam Type:	**Lab Mid**		

Instruction/Notes:

- Taking some illegal online/offline help (i.e. cheating) might earn you an **F** grade in the entire course. Using mobile phone is strictly prohibited.
- Submission path**: Xeon\Spring2019\Maryam Kamal\ LabMid\Section(G,H or I)**
- **Do not submit** your folder as **zip**.
- Naming format of folder should be L18-1234. This pattern should be strictly followed

⇨ Use of Arrays and built-in functions is strictly not allowed for any question.

Question 1 (15 marks)

Write a program in C++ to display the multiplication table from 1 to n uptil n*n. The output should be in exact same format as given in sample run.

Sample Run:

Input: 5

Output:

```
   1 2 3 4 5
1| 1 2 3 4 5
2| 2 4 6 8 10
3| 3 6 9 12 15
4| 4 8 12 16 20
5| 5 10 15 20 25
```

Question 2 (15 marks)

Given a number **N (3 digit number)** containing digits from **1 to 9** only. The task is to generate a new number using the number N such that the frequency of each digit in the new number is equal to the frequency of that digit in N multiplied by the digit itself.

Note: The digits in the new number must be in increasing order.

Sample Run:

Input : N = 312
Output : 122333

Explanation : The output contains digit 1 once, digit 2 twice and digit 3 thrice

Question 3 (20 marks)

Write a program that displays the binary equivalent of the decimal number n.
Your program's only input is the number n, where 1<=n<=1024.

**For this question declaring a multiple number of variables for storing the bits would result in a zero marks!*

Sample Run:

Input: 56
Output: 111000

Input : 1001
Output: 1111101001

Good Luck ☺