

## Lab 5: Programming Fundamentals

### Nested Loops

#### Instructions

- Make your own files like Q1.cpp, Q2.cpp, zip the files with your roll number and upload on the slate. Someone failed to upload the task, will be awarded with zero marks.
- *Apply proper checks and necessary conditions while taking input and calculating a value*
- *Use proper Indentation in your code. Marks will be deducted if proper indentation is missing.*
- Please read the questions carefully, read them twice even thrice to understand them completely.
- In case of any query, please raise your hands and we will be there to solve your query.
- Identify the appropriate data types of variables that you want to use in the program.
- Always print the appropriate messages for the inputs and outputs of program in proper formatted style.
- *You are required to complete all the tasks in lab time. Evaluation will be started 30 minutes before end time.*
- You are advised to delete your code while you are leaving lab, in case of plagiarism you can be awarded with F grade in lab.
- Please concentrate, understand and code. Good Luck :)

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**Q 1.** Write a c++ program that takes a number from the user and prints the reversed number.

**Q 2.** Write a c++ program that takes a number from the user and print the pattern as:

```
if n=4:
1 2 3 4
1 2 3 4
1 2 3 4
1 2 3 4
```

**Q 3.** Write a c++ program that takes a number from the user and print the pattern as:

```
if n=4:
1 0 0 0
0 1 0 0
0 0 1 0
0 0 0 1
```

**Q 4.** Write a c++ program that takes a number and a character from the user and print the pattern as:  
if number is 4 and character is \*:

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

**Q 5.** Write a c++ program that takes a number and a character from the user and print the pattern as:  
if number is 5 and character is \*:

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

\*   \*  
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**Q 6.** Write a c++ program that takes a number(n) from the user and print Strong numbers between 1 to n.

**Strong number** is a special number whose sum of factorial of digits is equal to the original number. For example: 145 is strong number. Since,  $1! + 4! + 5! = 145$

**Q 7.** Write a c++ program which takes two numbers(m & n) from user and calculate the result of power ( $m^n$ ) without using \* operator.

**Q 8.** Write a program in C++ that takes number from user, create and display unique three-digit number using 1, 2, 3, 4.(given n as 4) Also count how many three-digit numbers are there. Sample Output:

The three-digit numbers are: 123, 124, 132, 134, 142, 143, 213, 214, 231, 234, 241, 243, 312, 314, 321, 324, 341, 342, 412, 413, 421, 423, 431, 432

Total number of the three-digit-number is: 24