**Artificial Intelligence**

**Fall 2020**

**LAB – 1**

**The objective of this lab is to:** Revise Basic Programming Skills using Python

**Course & Lab Instructor:** *Dr. Mian Mubashir*

**Instructions:**

* Gossips are not allowed. So be gentle and do what you know. The lab is not to deduct your sessional marks but to prepare you to achieve good marks in quizzes, mids and finals and finally have good grades. So, try to perform all your tasks on time and on your own.
* Teacher assistants are for your help, so be nice with them.
* Raise your hands if you have some problem and need help from TA.
* Avoid calling them by raising your voice and disturbing the environment of the Lab.
* All tasks should be done in Python
* Good Programming practices should be followed
* All questions must be attempted

**Questions**

1. **Take a number from the user and decide if it is even.**
2. **Take a year as input and check if it is a leap year or not.**
3. **Take a number from the user and display counting from 1 to that number.**
4. **Take a number from the user and display counting from that number to 1.**
5. **Take a number from the user as input and output that number that number times.**
6. **Take a number from the user as input and output the table which shows multiplication of the number from 1 to 10.**
7. **Take two numbers from the user as input and output the table which shows multiplication of the first number from 1 to the second number.**
8. **Take a number from the user as input and determine whether the number is prime or not.**
9. **Take a number from the user as input and calculate the factorial of the number.**
10. **Take a number from the user as input and add its digits.**
11. **Take a number from the user as input and check if it is an Armstrong number (**Armstrong number is a number that is equal to the sum of its own digits raised to the power of the number of digits. For example, 153 is an Armstrong number because 1^3 + 5^3 + 3^3 = 153.)
12. **Take a number from the user as input and check if it is a perfect number like 6=1+2+3.**
13. **Display Fibonacci series of a given length for example:**0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233.
14. **Ask a number from user as input and reverse its digits**
15. **Take a number from the user as input and check if it is a palindrome number.**

**BONUS QUESTIONS**

1. **Write a Python function that takes a list of integers as input and returns the two numbers whose product is maximum among all possible pairs of numbers in the list.**
2. **Write a Python program that generates a random password that meets the following criteria:**

* The password must be at least 8 characters long and no more than 8 characters long.
* The password must contain at least one uppercase letter, one lowercase letter, one digit, and one special character (e.g. !@#$%^&\*()\_+-=[]{}|;:"<>,.?/).
* The password must not contain any spaces. (You can use Built-In-Functions of Python)
* Your program should output the generated password.

**Note:**

It is recommended to implement functions for each task as it will help in debugging and evaluation.

**Good luck!**