Python Programming (B.Tech CSE - Sem 2)
Experiment 03 – Exercise Sheet
Loops and Basic Programs

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Repository: `https://github.com/tali7c/Python-Programming`

Note: This document contains only problem statements (no solutions).

Instructions

- Write a separate Python program for each exercise.
- Use loops and conditionals as needed.
- Validate input where appropriate (example: negative numbers).
- Display output clearly and consistently.

Exercises

Exercise 01: Factorial of a Number

Write a Python program to compute the factorial of a non-negative integer n using a loop.

Input: an integer n
Output: $n!$ (and a suitable message if $n < 0$)

Exercise 02: Armstrong Number Check

Write a Python program to check whether an integer n is an Armstrong number. An Armstrong number is a number equal to the sum of its digits raised to the power of the number of digits.

Input: an integer n
Output: print whether n is Armstrong or not

Exercise 03: Fibonacci Series

Write a Python program to print the first n terms of the Fibonacci series using iteration.

Input: an integer n (number of terms)
Output: the first n Fibonacci numbers

Exercise 04: Prime Number Check

Write a Python program to check whether a given integer n is prime.

Input: an integer n
Output: print whether n is prime or not

Exercise 05: Palindrome Check

Write a Python program to check whether an input string/number is a palindrome (reads the same forward and backward).

Input: a string (or number as input text)
Output: print whether it is a palindrome or not

Exercise 06: Sum of Digits

Write a Python program to compute the sum of digits of an integer.

Input: an integer n
Output: sum of digits of n

Exercise 07: Numbers Divisible by 5 or 7 (1 to 100)

Write a Python program to generate and display all integers between 1 and 100 that are divisible by 5 or by 7. Also display the total count.

Input: none
Output: list of numbers and the count

Exercise 08: Lowercase to Uppercase

Write a Python program to convert an input string to uppercase.

Input: a string
Output: uppercase version of the string

Exercise 09: Multiplication Table

Write a Python program to print the multiplication table of a given integer from 1 to 10.

Input: an integer n
Output: lines of the form `n * i = result` for $i = 1..10$

Exercise 10: Pattern Printing

Write a Python program to print the following pattern for $n = 5$:

```
123454321
1234 * 321
123  * *  21
12   * * *   1
1    * * * *
```

Input: none (or optionally take n as input)
Output: print the pattern line by line

Exercise 11: Harmonic Series Sum

Write a Python program to compute the sum of the harmonic series:

$$1 + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{n}$$

Input: an integer n
Output: the sum (print up to 4 decimal places)