CS 115 - Introduction to Programming in Python

Lab 02

Lab Objectives: Strings, Loops, Nested Loops, Numerical Programs

1. Write a Python program that creates and displays a string made of the first 2 and the last 2 chars of a given a string. If the string length is less than 2, then pad the extra spaces with the ! character.

   Sample Runs:

   ```
   Enter string: a
   aa!!

   Enter string: abcd1234
   ab34
   ```

2. Write a program that inputs a lower bound and upper bound from the user and finds and displays the number and average of all numbers between the lower and upper bound (inclusive) that are divisible by 7, but that are not a multiple of 5. Your program should validate that the lower bound is less than the upper bound.
   Sample Run 1:

   ```
   Enter lower bound: 3000
   Enter upper bound: 2000
   Invalid range
   ```

   Sample Run 2:

   ```
   Enter lower bound: 2000
   Enter upper bound: 3500
   172 values are divisible by 7 but not 5 between 2000 and 3500 inclusive
   Average Value:  2747.5
   ```

3. Write a program to determine how long it will take you to save enough money to make a down payment (peşin) for a house, given the following:

- You may assume that the down payment must be 25% of the cost of the house.
- Assume you have a starting current savings of 0.
- Assume that you invest your current savings wisely, with an annual return of r (in other words, at the end of each month, you receive an additional current_savings*r/12 funds to put into your savings – the 12 is because r is an annual rate). Your investments earn a return of r = 0.04 (4%).
- You have an annual salary, and you save a decimal portion (0.1 for 10%) of your annual salary each month for the down payment (portion_saved). 5. Assume your annual salary is annual_salary. 6.
- At the end of each month, your savings will be increased by the return on your investment, plus a percentage of your monthly salary (annual salary / 12).

Write a program to calculate how many months it will take you to save enough money for a down payment. You should input the starting annual salary, portion to be saved of the salary, and the cost of the house from the user.