Python Programming Assignment 01

Instructions: Implement Python programs to accomplish the following tasks

1. **Age Assignments Based on the Riddle**

    - **Problem Statement:** Write a program to solve this age-related riddle! Anton, Beth, Chen, Drew, and Ethan are all friends. Their ages are as follows:
        - Anton is 21 years old.
        - Beth is 6 years older than Anton.
        - Chen is 20 years older than Beth.
        - Drew is as old as Chen's age plus Anton's age.
        - Ethan is the same age as Chen.
    - Your code should store each person's age to a variable and print their names and ages at the end.

      Anton is 3

      Beth is 4

      Chen is 5

      Drew is 6

      Ethan is 7

2. **Formatted String Interpolation**

    - **Task:** Given the variables `name`, `age`, and `city`, use f-strings to construct a sentence that describes a person using these variables.

      name:str = "Alice"

      age:int = 30

      city:str = "New York"

    - **Instructions:** Use an f-string to create a sentence in the format: `"Alice is 30 years old and lives in New York."`
    - **Expected Output:**

Alice is 30 years old and lives in New York.

3. **String Manipulation**

   - **Task:** Given the string `s`, use string methods to:
     - **Capitalize the first letter:** make the first character uppercase and the rest of the string lowercase.
     - **Convert to uppercase:** change all characters in the string to uppercase.
     - **Convert to lowercase:** change all characters in the string to lowercase.

   s:str = "hElLo WoRlD"

   - **Expected Output:**

     Hello world

     HELLO WORLD

     hello world

4. **Substring Search**

   - **Task:** Given the string `s`, use string methods to:
     - **Find the index of "fox":** get the starting index of the substring "fox". If "fox" is not found, it should return -1.
     - **Count occurrences of "the":** Use the string's built-in method to count how many times the substring "the" appears in the string.

   s:str ="the quick brown fox jumps over the lazy dog"

   - **Expected Output:**

     index of 'fox' is 16

     'the' appears 2 times

5. **String Replacement**

   - **Task:** Given the string `s`, use string methods to:
     - **Replace "Python" with "Java":** substitute "Python" with "Java".

   s:str ="I love programming in Python"

- **Expected Output:**

  I love programming in Java

6. **String Splitting and Joining**

   - **Task:** Given the string `s`, use string methods to:
     - **Split into a list:** break the string into a list of substrings based on the delimiter `,`.
     - **Join with spaces:** combine the list of substrings back into a single string, with each element separated by a space.

   s:str ="apple,banana,cherry,dates"

   - **Expected Output:**

     ["apple", "banana", "cherry", "dates"]

     apple banana cherry dates

7. **String Stripping and Justifying**

   - **Task:** Given the string `s`, use string methods to:
     - **Remove leading/trailing spaces:** remove all leading and trailing whitespace characters from the string.
     - **Left justify with '*':** left justify the string within a field of width 20, using `*` as the fill character.
     - **Right justify with '*':** right justify the string within a field of width 20, using `*` as the fill character.

   s:str ="   Python is fun!   "

   - **Expected Output:**

     Python is fun!

     Python is fun!*****

     *****Python is fun!

8. **Convert an integer to its binary representation**

   - **Task:** Given an integer `num`

    - Obtain the binary representation of `num`

  num:int = 45

- **Expected Output:**

  Binary representation : 0b101101

9. **Calculate Powers of Numbers.**

   - **Task:** Given two integers `base` and `exponent`
     - Compute `base` raised to the power of `exponent`.

     base:int = 3

     exponent:int = 4

   - **Expected Output:**

     Power result: 81

10. **Round floating-point numbers**

    - **Task:** Given a floating-point number `value`
      - Round `value` to the nearest integer.
      - Round `value` to two decimal places.

      value:float = 12.34567

    - **Expected Output:**

      Rounded to nearest integer: 12

      Rounded to two decimal places: 12.35