Programming Exercises

Basic Arithmetic Calculator

Write a function that takes two numbers and an operator (+, -, *, /) as input and returns the result.
Handle cases where division by zero might occur.

Temperature Converter

Write a function that converts temperature from Celsius to Fahrenheit and vice versa.
Accept temperature value and unit ('C' for Celsius, 'F' for Fahrenheit) as inputs.
Convert accordingly and return the result.

Check Leap Year

Write a function that determines if a given year is a leap year.
A year is a leap year if it is divisible by 4 but not divisible by 100, except if it is also divisible by 400.

Find Prime Numbers in a Range

Write a function that takes two numbers (start, end) and returns a list of all prime numbers between them.
Ensure that the function correctly identifies prime numbers and handles edge cases where start is greater than end.

Find the Longest Word

Write a function that takes a sentence as input and returns the longest word in the sentence.
If multiple words have the same longest length, return the first one that appears.

Count Words in a Sentence

Write a function that counts the number of words in a given sentence.
Words are separated by spaces, and the function should ignore extra spaces.

Reverse a String

Write a function that takes a string as input and returns the string reversed.

Programming Exercises

Example:
reverseString('hello') -> 'olleh'

Sum of List Elements

Write a function that takes a list of numbers and returns the sum of all elements.
Example:
sumList([1, 2, 3, 4, 5]) -> 15

Library Management System

Create a system to manage books in a library.
Implement a Book class with properties like title, author, isbn, and isAvailable.
Implement a Library class with methods:
- addBook(Book book): Adds a book to the library.
- borrowBook(String isbn): Marks a book as borrowed if available.
- returnBook(String isbn): Marks a book as available again.
- searchByTitle(String title): Returns books matching the title.
Ensure that the system correctly updates the book's availability.

Employee Payroll System

Implement an employee payroll system.
Create a base Employee class with properties: name, id, and salary.
Implement a method calculateSalary() in the base class.
Create two subclasses:
- FullTimeEmployee: Adds a bonus and overrides calculateSalary() to include the bonus.
- PartTimeEmployee: Adds hoursWorked and hourlyRate, overriding calculateSalary() to compute salary based on hours worked.