COMSATS University Islamabad, Islamabad Campus

Department of Computer Science

Lab Assignment 4

Subject: CSC101 - Applications of Information and Communication Technologies **Instructor :** Mr. Muhammad Haris

Total Marks: **5 * 10 = 50**

(CLO-7: Implement an algorithm in a programming language to solve a simple problem.)

1. Write a calculator function that takes two numbers and a string specifying the operation and returns the result. It should be able to do addition, subtraction, multiplication, and division.

2. Write a program that takes in 4 numbers and returns the largest number of them all. 137

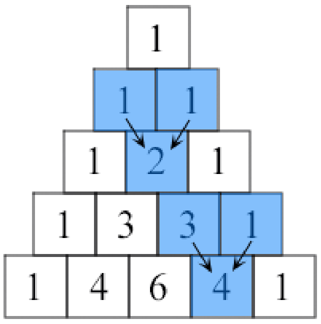
3. Write a function that takes in a number and returns the Fibonacci sequence till that number. The Fibonacci Sequence is the series of numbers:

   0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...

   The next number is found by adding up the two numbers before it.

4. Write a function that takes in parameters for different shape measurements and returns the area of that shape depending upon those measurements and the type of shape. If the type of shape is not specified it should by default calculate the area of a rectangle. It should be able to calculate the area of square, rectangle, circle, and triangle.

5. Write a Python function that prints out the first n rows of Pascal's triangle
   Sample Pascal's triangle:



Assignment Evaluation

Criterion	Excellent (85–100%)	Good (70–84%)	Satisfactory (50–69%)	Unsatisfactory (<50%)
1. Problem Understanding (30%)	Clear and complete problem understanding; appropriate assumptions stated.	Mostly clear understanding with minor assumption issues.	Some misunderstanding; vague assumptions.	Major misunderstanding or problem not identified.
3. Code Implementation (50%)	Code is syntactically correct, runs flawlessly, and meets all requirements.	Minor syntax or logic errors, mostly functional.	Code compiles but has major runtime or logical issues.	Code fails to run or doesn't address the problem.
4. Code Readability & Structure (10%)	Well-commented, clean, and modular code. Proper use of functions and naming conventions.	Adequate formatting and structure with few improvements needed.	Poor structure; inconsistent naming; limited commenting.	Disorganized and unreadable code.
5. Testing & Output (10%)	Extensive and appropriate test cases with correct results.	Adequate testing with mostly correct outputs.	Limited testing; some incorrect outputs.	No testing or incorrect results.

Assignment Evaluation Rubric

Criterion	Excellent (85–100%)	Good (70–84%)	Satisfactory (50–69%)	Unsatisfactory (<50%)
1. Problem Understanding (15%)	Clear and complete problem understanding; appropriate assumptions stated.	Mostly clear understanding with minor assumption issues.	Some misunderstanding; vague assumptions.	Major misunderstanding or problem not identified.
2. Algorithm Design (20%)	Efficient, well-structured algorithm with logical flow.	Mostly correct logic with minor flaws.	Partially correct logic; inefficiencies present.	Flawed or missing algorithm design.
3. Code Implementation (25%)	Code is syntactically correct, runs flawlessly, and meets all requirements.	Minor syntax or logic errors, mostly functional.	Code compiles but has major runtime or logical issues.	Code fails to run or doesn't address the problem.
4. Code Readability & Structure (15%)	Well-commented, clean, and modular code. Proper use of functions and naming conventions.	Adequate formatting and structure with few improvements needed.	Poor structure; inconsistent naming; limited commenting.	Disorganized and unreadable code.
5. Testing & Output (15%)	Extensive and appropriate test cases with correct results.	Adequate testing with mostly correct outputs.	Limited testing; some incorrect outputs.	No testing or incorrect results.
6. Innovation / Optimization (5%)	Solution is optimized or includes an innovative element.	Some signs of optimization or thoughtful coding.	Little to no effort in optimizing the solution.	No attempt at innovation or optimization.
7. Documentation / Report (5%)	Clear explanation of algorithm, code, and testing process.	Mostly clear; minor issues in explanation or structure.	Incomplete or unclear documentation.	No documentation or irrelevant content.