1. Write a simple algorithm for finding the maximum of three numbers using pseudo code.

   Algorithm FindMaximumOfThreeNumbers

     Input: Three numbers a, b, c

     Output: Maximum number among a, b, c

     Begin

       max = a

       If b > max Then

         max = b

       End If

       If c > max Then

         max = c

       End If

       Return max

     End

2. Compare and contrast two different programming languages, highlighting their strengths and weaknesses.

## Python vs. Java

1. **Syntax**:
   a. **Python**: Simple and readable; beginner-friendly but sensitive to indentation.
   b. **Java**: Verbose but explicit; better for large, structured projects.
2. **Performance**:
   a. **Python**: Slower due to interpretation and dynamic typing.

b. **Java**: Faster with compiled bytecode and JVM.
3. **Applications**:
    a. **Python**: Great for data science, machine learning, web development, and automation.
    b. **Java**: Ideal for enterprise applications, Android development, and back-end systems.
4. **Typing**:
    a. **Python**: Dynamically typed; flexible but prone to runtime errors.
    b. **Java**: Statically typed; reduces errors and improves maintainability.
5. **Ecosystem**:
    a. **Python**: Extensive libraries for modern trends but less optimized for some specialized tasks.
    b. **Java**: Mature frameworks (e.g., Spring, Hibernate) for enterprise needs.

3. Explain the compilation process and how it differs from interpretation.

## Compilation:

1. **Process**: Translates the entire source code into machine code before execution.
2. **Output**: Produces an executable file.
3. **Speed**: Faster execution since code is pre-compiled.
4. **Error Detection**: Errors are identified during compilation.
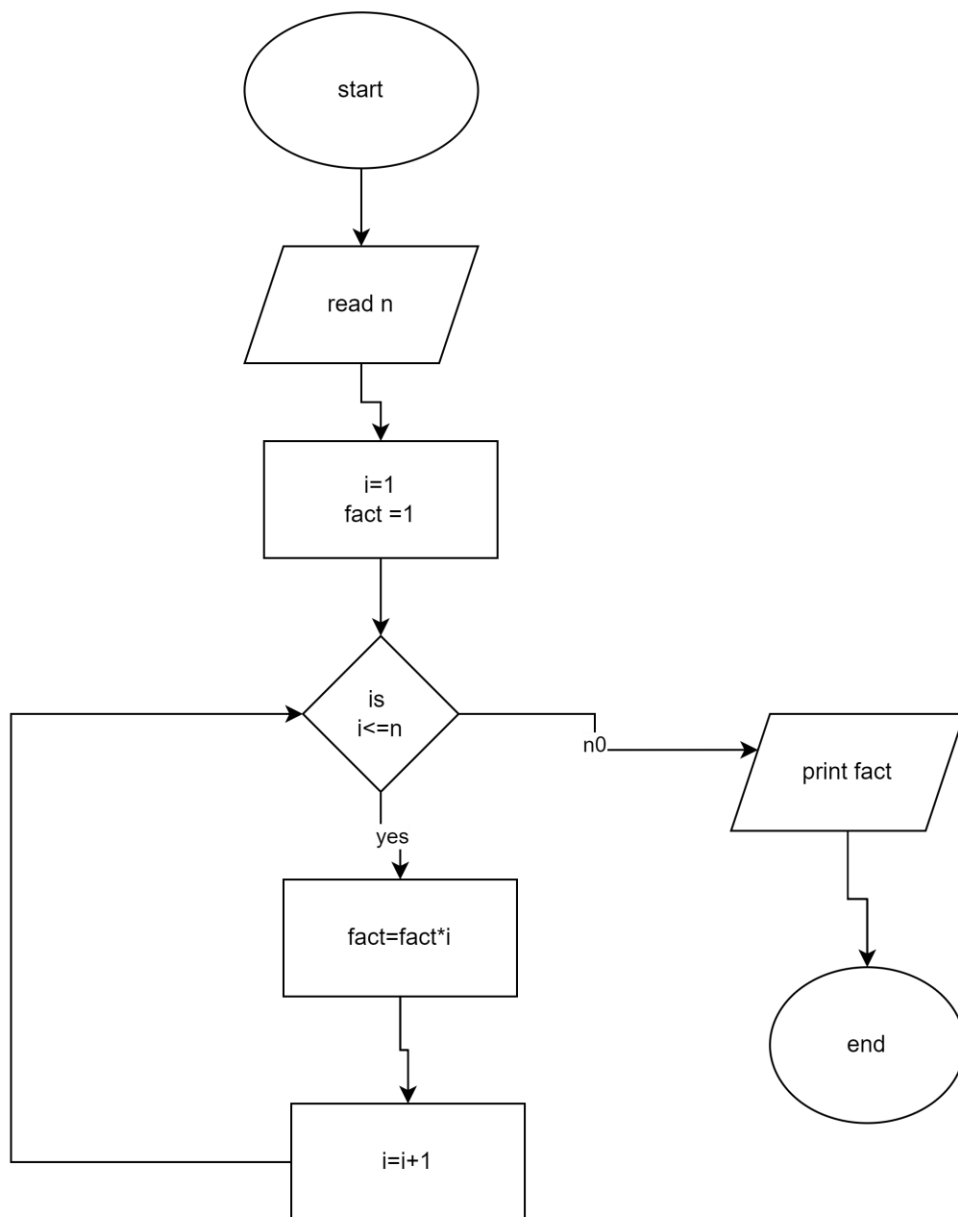
**Examples**: C, C++.

## Interpretation:

1. **Process**: Translates and executes code line-by-line during runtime.
2. **Output**: No executable file; directly executed.
3. **Speed**: Slower due to real-time translation.
4. **Error Detection**: Errors occur during runtime.

**Examples**: Python, JavaScript.

4. Create a flowchart for a program that calculates the factorial of a given number.

```
                    ┌─────────┐
                    │  start  │
                    └────┬────┘
                         │
                         ▼
                    ┌─────────┐
                    / read n  /
                    └────┬────┘
                         │
                         ▼
                    ┌─────────┐
                    │  i=1    │
                    │ fact =1 │
                    └────┬────┘
                         │
                         ▼
                      ╱──────╲
                     ╱  is    ╲        no          ┌──────────┐
                     ╲ i<=n   ╱ ──────────────────▶/ print fact/
                      ╲──────╱                      └─────┬────┘
                         │                                │
                        yes                               ▼
                         │                            ┌────────┐
                         ▼                            │  end   │
                    ┌──────────┐                      └────────┘
                    │fact=fact*i│
                    └────┬─────┘
                         │
                         ▼
                    ┌─────────┐
                    │  i=i+1  │
                    └─────────┘
```

5. Write a function in your preferred programming language to calculate the area of a rectangle.

```python
def calculate_rectangle_area(length, width):

        return length * width

 length = 5

 width = 3

area = calculate_rectangle_area(length, width)

print(area)
```