

# Programming

## Introduction

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# Terms

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What is programming?

**Programming** is the act of making a program.

# Terms

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A **program** is a set of instructions directs the computer on its operations.

# Terms

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What is programming?

**Programming** is the act and art of making a program.

**Programmers** are the people who create the programs.

What is a program?

A **program** is a set of instructions directs the computer on its operations.

# Program Planning and Development

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Problem Analysis

# Program Planning and Development

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## Problem Analysis

- Read and understand.

# Program Planning and Development

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- Identify which data are available or given (*input*), and what result to produce (*output*)



# Program Planning and Development

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## Problem Analysis

- Read and understand.
- Identify which data are available or given (*input*), and what result to produce (*output*)
- Choose a descriptive names for each of them.
- Determine the processes to produce the desired output (e.g. formula)

# Program Planning and Development

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Problem Analysis



Algorithm Design

# Program Planning and Development



```
graph TD; A[Problem Analysis] --> B[Algorithm Design];
```

Problem Analysis

Algorithm Design

- An *algorithm* is a well-defined sequence of instructions to solve a problem.

# Program Planning and Development

Problem Analysis



Algorithm Design

- An *algorithm* is a well-defined sequence of instructions to solve a problem.
  - phrases or sentences
  - flowchart
  - pseudo-code

# Program Planning and Development

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Problem Analysis



Algorithm Design



Coding

# Program Planning and Development

Problem Analysis



Algorithm Design



Coding

*Coding* is the process of converting instructions in the algorithm to a language that the computer can understand.

# Program Planning and Development

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Problem Analysis



Algorithm Design



Coding



Encoding



# Program Planning and Development

Problem Analysis



Algorithm Design



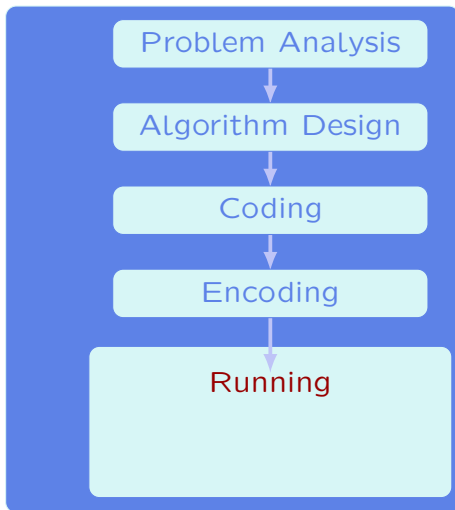
Coding



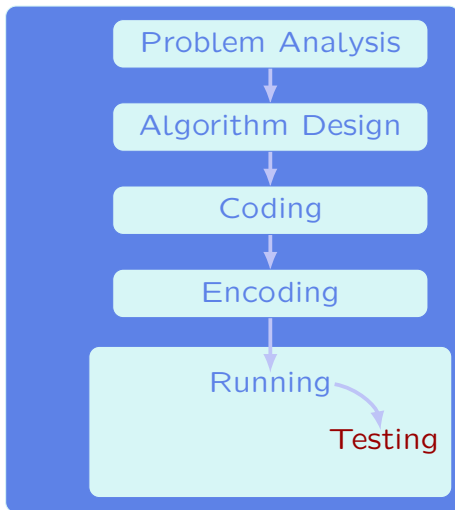
Encoding

*Encoding* is the process of entering the program code through a computer terminal directly into the computer memory.

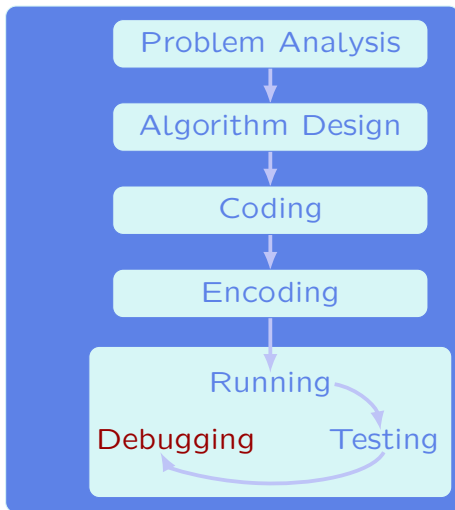
# Program Planning and Development



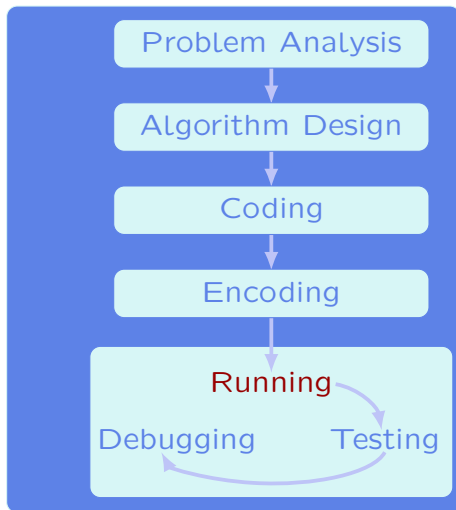
# Program Planning and Development



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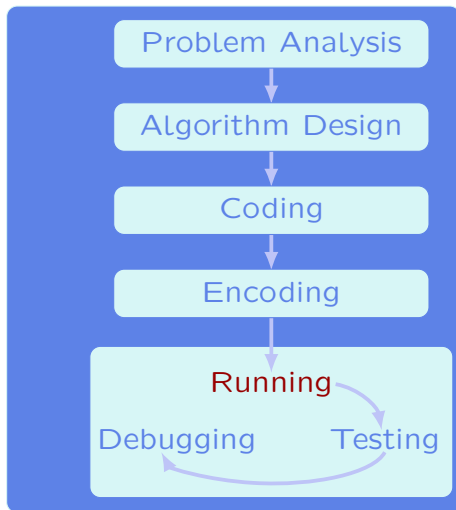


# Program Planning and Development



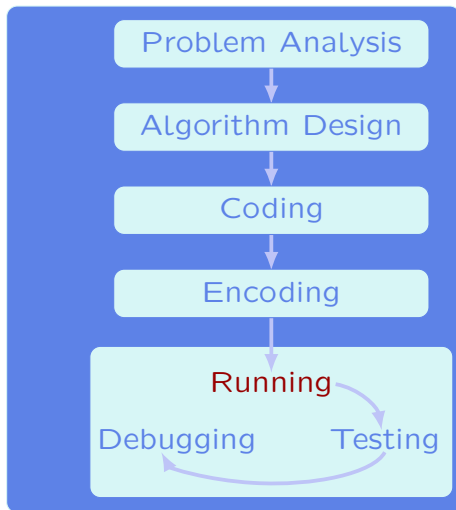
- Compile and run the program
  - **Compilation** is the process of conversion of source code to machine code.

# Program Planning and Development



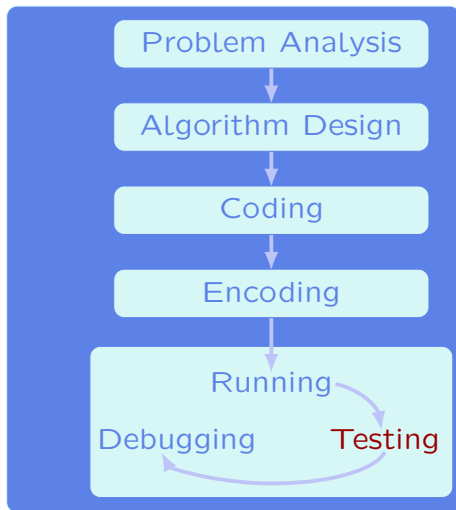
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  - Once compilation is successful, i.e. *no syntax errors*, an **executable file** is generated.

# Program Planning and Development



- Compile and run the program
  - **Compilation** is the process of conversion of **source code** to **machine code**.
  - Once compilation is successful, i.e. *no syntax errors*, an **executable file** is generated.
  - **Running** a program is to execute the program.

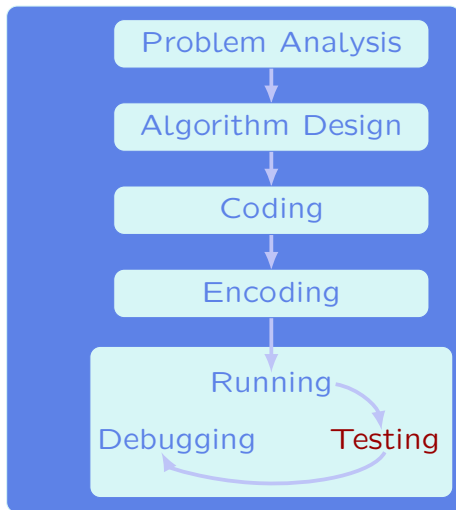
# Program Planning and Development



- **Testing** the program is a process to check whether the program matches the expected requirements.

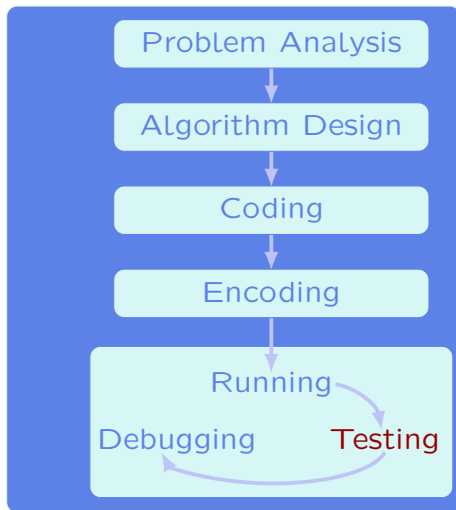


# Program Planning and Development



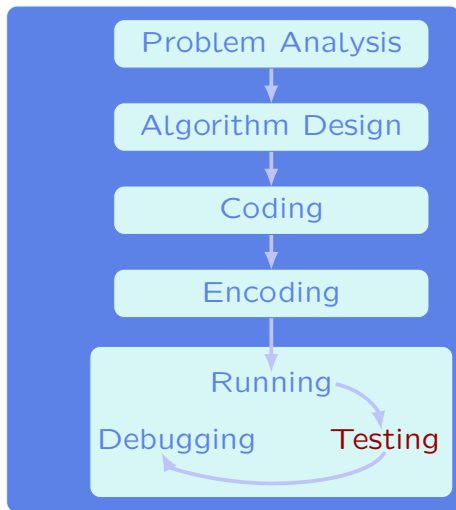
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# Program Planning and Development



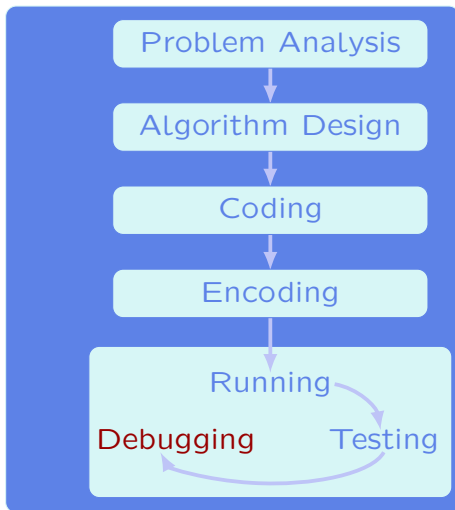
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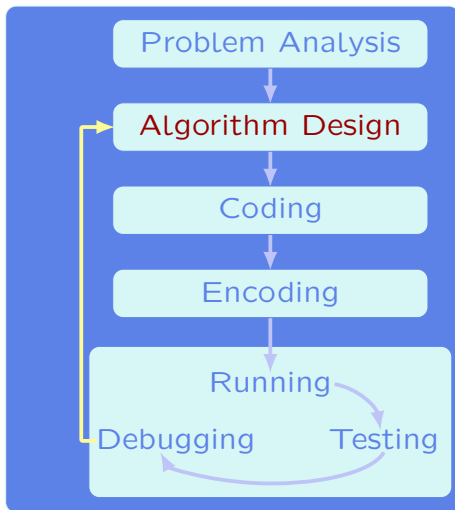
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    - ▶ Syntax vs. Logical
    - ▶ Compile-time vs. Run-time

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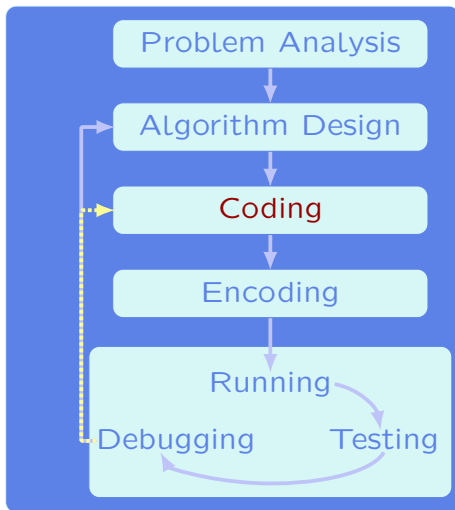


- **Testing** the program is a process to check whether the program matches the expected requirements.
  - It involves the creation of test sets.
  - It allows discovery of *bugs* or errors, if any.
    - ▶ **Syntax** vs. **Logical**
    - ▶ **Compile-time** vs. **Run-time**
- **Debugging** is the process of locating and removing errors in the program.

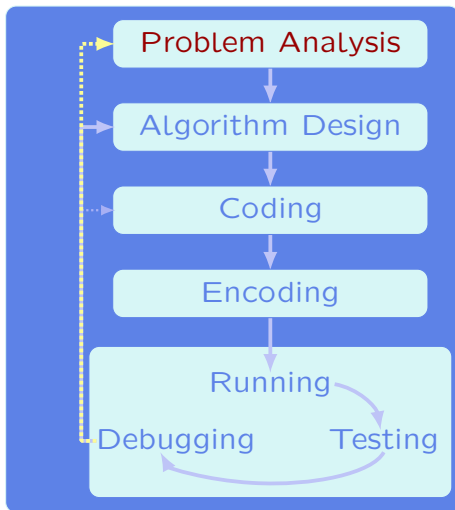
# Program Planning and Development



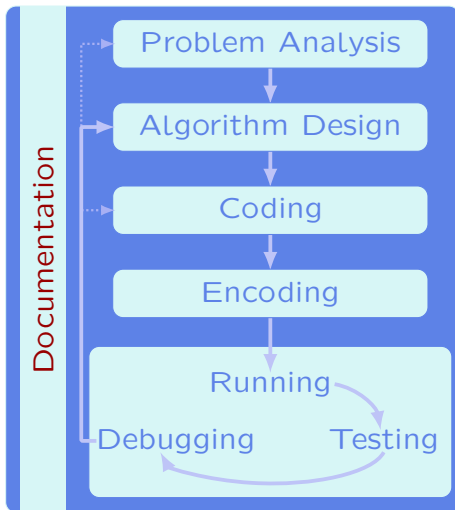
# Program Planning and Development



# Program Planning and Development

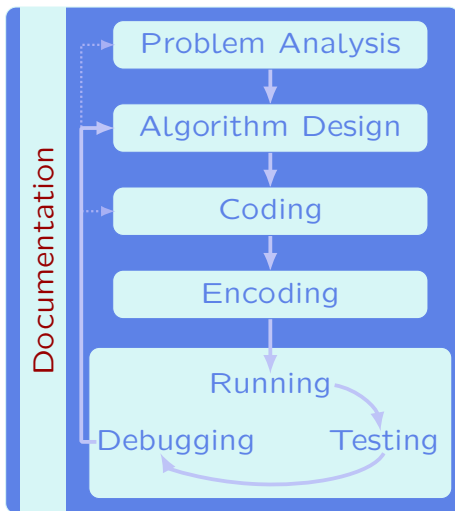


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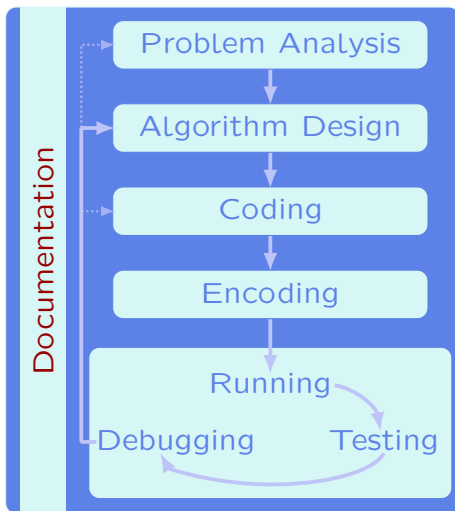


# Program Planning and Development



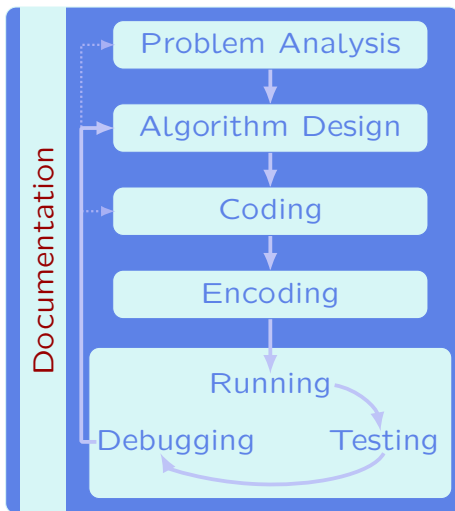
- Internal Documentation

# Program Planning and Development



- Internal Documentation
- Technical Manual

# Program Planning and Development



- Internal Documentation
- Technical Manual
- User Manual

# Sales Tax

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You are requested to write a program to determine the sales tax (12%) to be paid on a particular sales item. The user will be prompted to input the price of the item, the program will calculate and output the tax and total price of the item with tax added.

# Circle

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Write a program that asks the user to enter the radius of a circle then computes and displays its area. Recall that the formula to compute for the area is  $area = 3.1416 \times radius^2$ .

😊 Thank you! 😊