

# Module 1f: Introduction to Problem Solving and Python Fundamentals

Premanand S

Assistant Professor,  
School of Electronics and Engineering,  
Vellore Institute of Technology, Chennai

*premanand.s@vit.ac.in*

July 28, 2025

# What is a Flowchart?

- A **flowchart** is a diagram that represents the sequence of steps in solving a problem or performing a task.
- It uses standard symbols:
  - **Oval** – Start/End
  - **Parallelogram** – Input/Output
  - **Rectangle** – Process
  - **Diamond** – Decision
- Flowcharts are widely used in computer programming to design and explain algorithms visually.

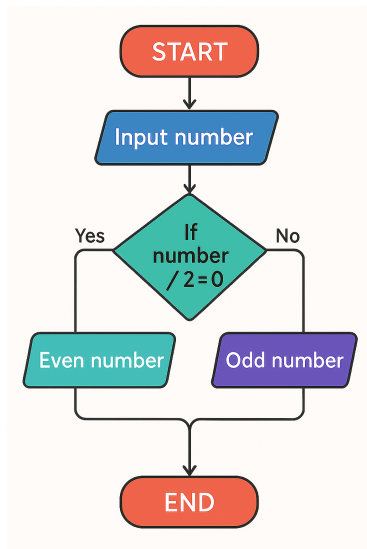
# Why Do We Need Flowcharts?

- **Visual Clarity** – Shows the logic in a clear, step-by-step manner.
- **Better Planning** – Helps organize thoughts before writing code.
- **Easier Communication** – Useful when explaining logic to others.
- **Debugging Aid** – Easier to spot logical errors before coding.
- **Reusable** – Can be adapted for similar problems or upgraded.

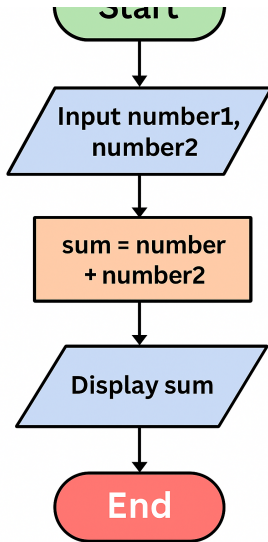
# Importance of Flowcharts in Programming

- Programming = Logical problem solving, not just coding.
- Flowcharts act as a **blueprint** for your program.
- Especially helpful for:
  - Beginners learning logic
  - Teams collaborating on code
  - Designing and documenting large projects
- Saves time, reduces bugs, and improves understanding.

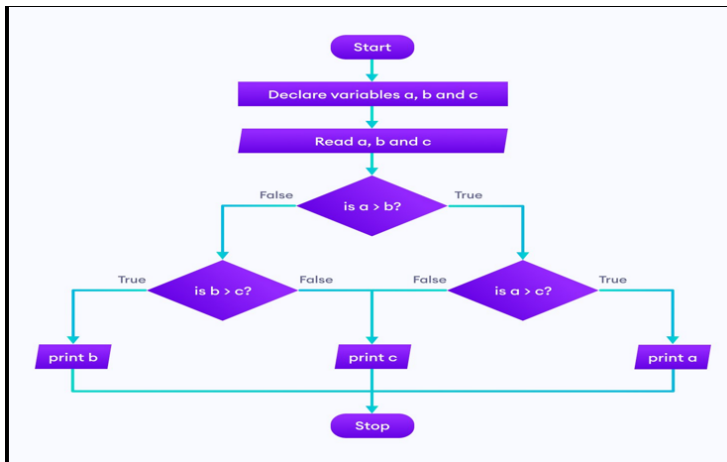
# Flowchart - Even or Odd



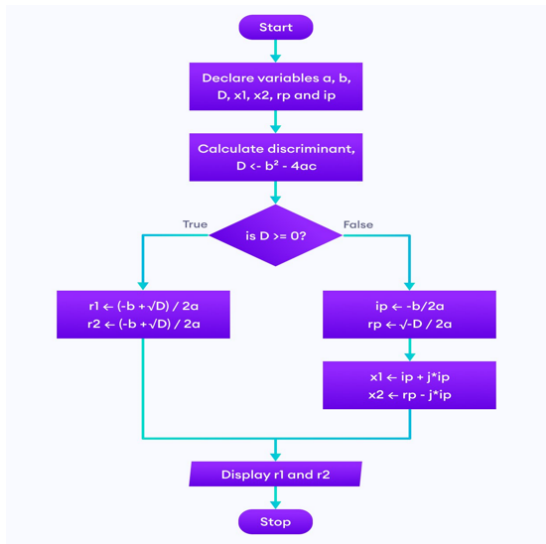
# Flowchart - Adding two numbers



# Flowchart - Greatest among three numbers



# Flowchart - Finding all the roots of a quadratic equation





# Assignment

- ATM Withdrawal System: Show steps for PIN verification, balance check, and cash dispensing.
- Traffic Signal Timer Control: Change signals (Red, Yellow, Green) based on timer.
- Online Food Ordering Flow: Choose food, place order, make payment, and confirm delivery.
- Password Strength Checker: Check for minimum length, numbers, uppercase, and special characters.
- Electricity Bill Calculator: Calculate bill based on units consumed using slab rates.

# Assignment

- Library Book Issue System: Check availability, issue book or place on hold.
- Login Authentication System: Verify credentials and limit login attempts.
- Student Grading System: Calculate average marks and assign grade.
- Bus Ticket Booking: Check seat availability, select seat, confirm booking.
- Email Validation Check: Validate email format (e.g., contains @ and .com).

# Assignment

- Temperature Converter: Convert temperature between Celsius, Fahrenheit, Kelvin.
- Mobile Recharge System: Select plan, confirm number, complete recharge.
- Online Exam Timer: Start exam, auto-submit on timeout, show result.
- Laundry Billing System: Calculate cost based on service type and quantity.
- E-commerce Checkout: Add to cart, apply coupon, complete payment.

mail me: [er.anandprem@gmail.com](mailto:er.anandprem@gmail.com) / [premanand.s@vit.ac.in](mailto:premanand.s@vit.ac.in)  
ring me: +91 73586 79961  
Follow me: [Linkedin](#)  
[Medium Blogs](#)  
[Analytics Vidhya: Blogs](#)

**Don't just code — think, plan, and solve**