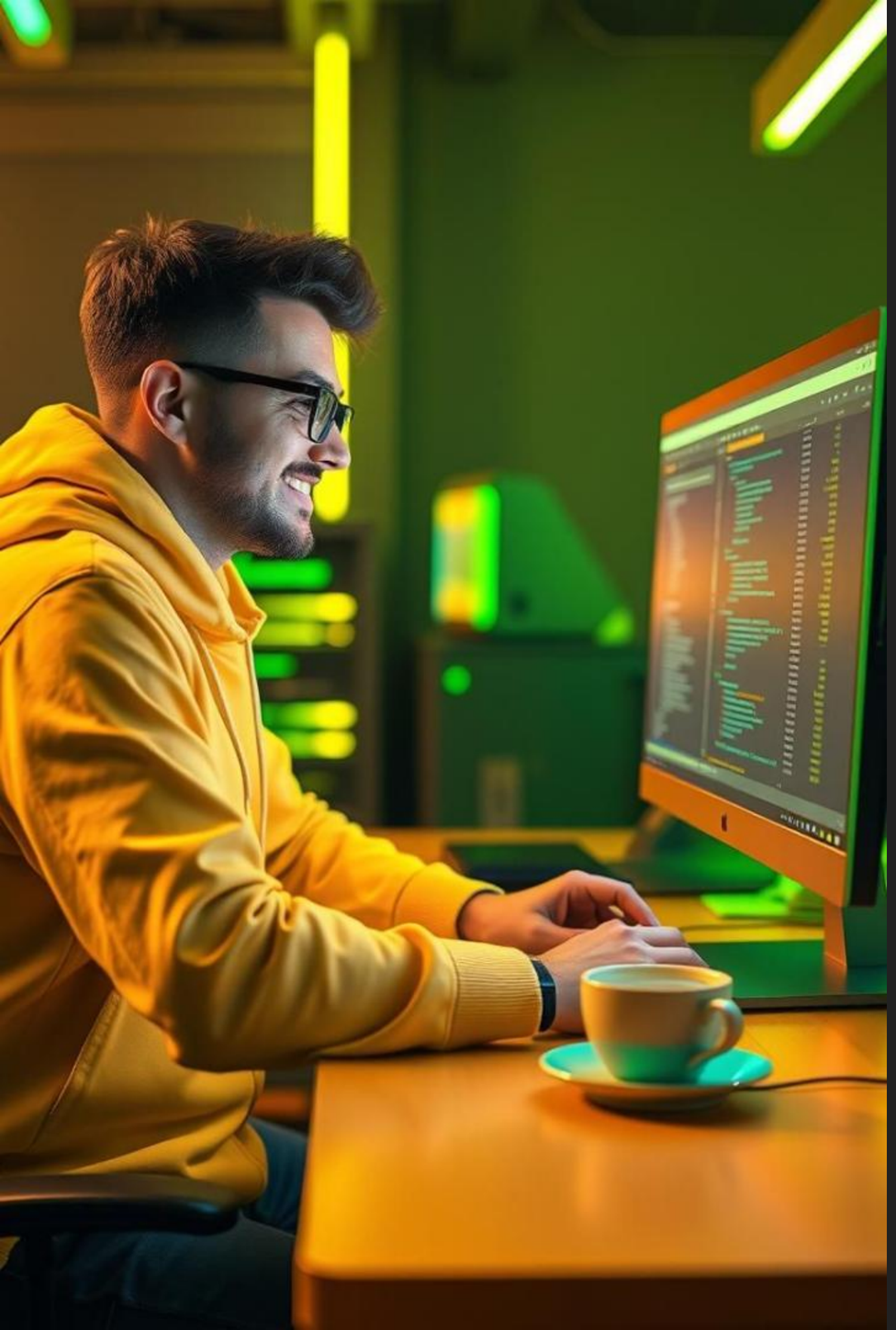
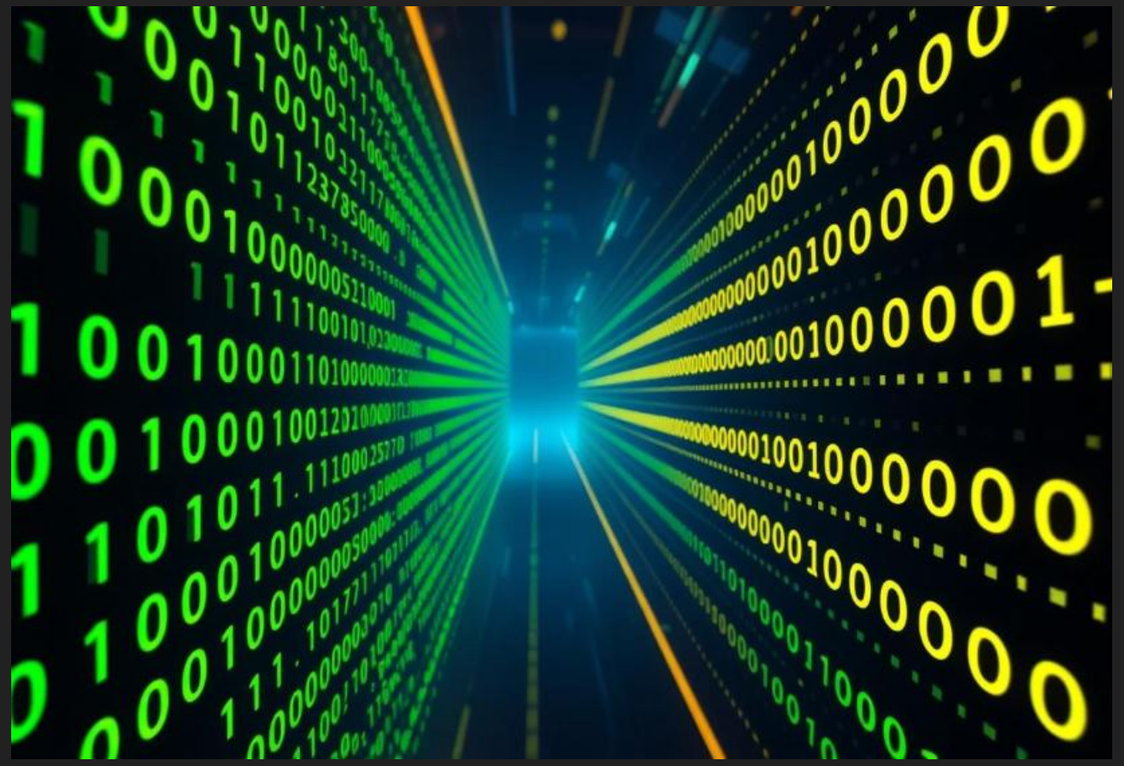


Embark on Your Coding Journey

Welcome to the world of computer programming! Code tells computers what to do. Programming is like crafting recipes for computers.

You'll transform data into actions, solving problems and building applications. Start with the basics. Unleash your potential to innovate.

Why Programming Is Essential



Computers are simple machines at their core. They speak in binary code: 0s and 1s.

Programming languages are the translator. They convert human instructions into machine code.

Think of it as a translator. Turn abstract thoughts into actions a computer can understand.

Programming Languages

Python

Java

Javascript

Programming languages are the tools of the trade. High-level languages abstract computer code. Low-level languages control hardware directly.

Python: beginner-friendly language for data science and web development. Java: cross-platform solution for enterprise applications and Android apps. JavaScript: language for interactive websites.

Core Programming Concepts

Variables

Store data.

Data types

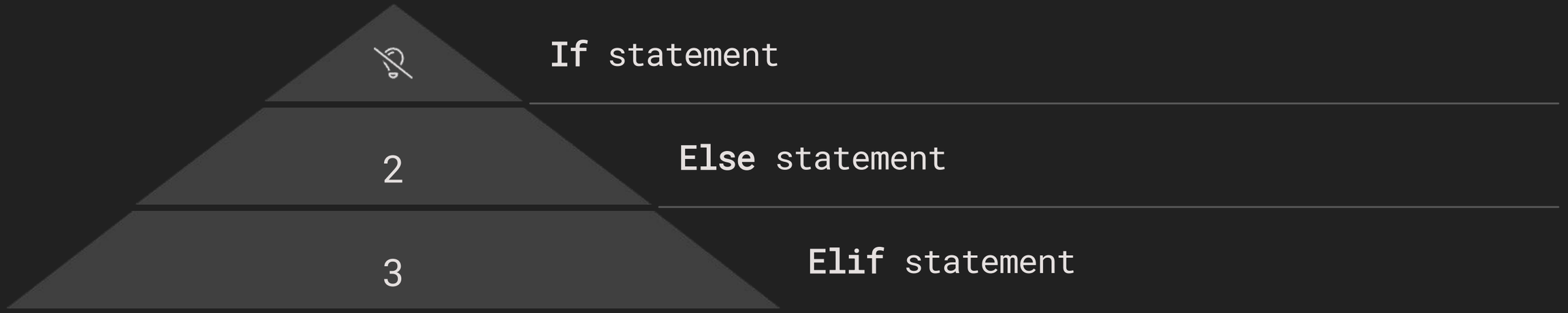
Organize data.

Functions

Reusable code.

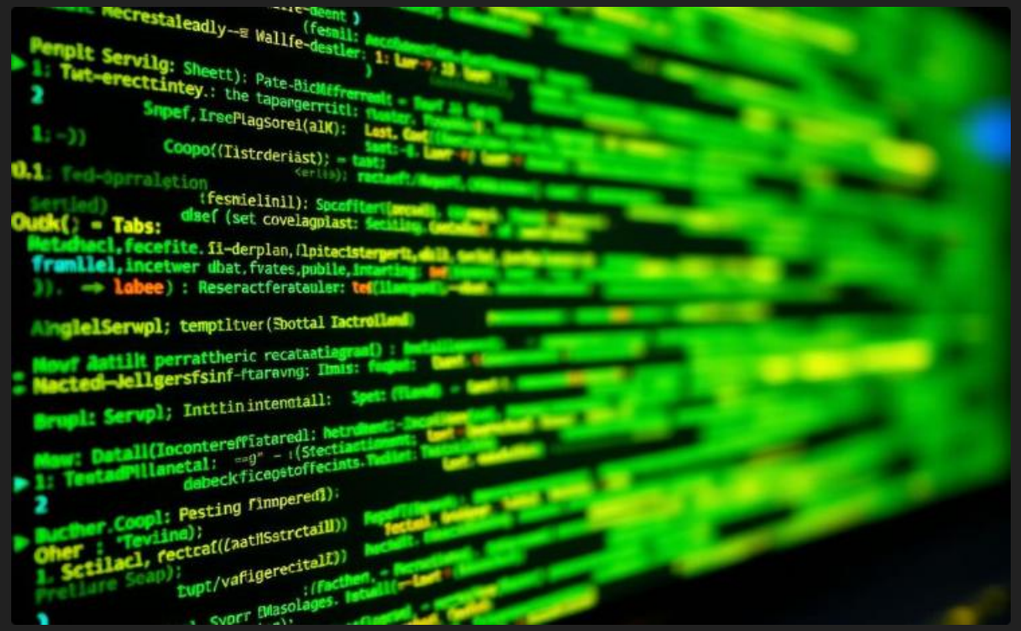
Variables store data, like a name or age. Data types define the kind of data. Operators perform actions. Control flow decides what to do. Functions reuse code.

Control Flow



Control flow is making decisions in code. **If** statements execute code if true. **Else** statements execute code if false. **For** and **While** loops repeat code.

Write Your First Program



Choose a simple language like Python. Set up a coding environment. Write a program to add two numbers. Experiment with code. Discover your own coding style.

```
# Simple Calculator in Python

# Function to perform arithmetic operations
def calculator():
    print("Simple Calculator")
    print("Select operation:")
    print("1. Add")
    print("2. Subtract")
    print("3. Multiply")
    print("4. Divide")

    # User input
    choice = input("Enter choice (1/2/3/4): ")

    # Taking input for numbers
    num1 = float(input("Enter first number: "))
    num2 = float(input("Enter second number: "))

    # Performing operations
    if choice == '1':
        print(f"Result: {num1} + {num2} = {num1 + num2}")
    elif choice == '2':
        print(f"Result: {num1} - {num2} = {num1 - num2}")
    elif choice == '3':
        print(f"Result: {num1} × {num2} = {num1 * num2}")
    elif choice == '4':
        if num2 != 0:
            print(f"Result: {num1} ÷ {num2} = {num1 / num2}")
        else:
            print("Error: Cannot divide by zero!")
    else:
        print("Invalid input. Please try again.")

# Run the calculator function
calculator()
```

* Python Code: Rock-Paper-Scissors Game

```
import random

def play_game():
    print("Welcome to Rock-Paper-
Scissors!")
    choices = ["rock", "paper", "scissors"]

    # Get user choice
    user_choice = input("Enter rock, paper,
or scissors: ").lower()

    # Validate input
    if user_choice not in choices:
        print("Invalid choice! Please enter rock,
paper, or scissors.")
        return

    # Get computer choice
    computer_choice =
random.choice(choices)

    # Display choices
    print(f"You chose: {user_choice}")
    print(f"Computer chose:
{computer_choice}")

    # Determine winner
    if user_choice == computer_choice:
        print("It's a tie!")
    elif (user_choice == "rock" and
computer_choice == "scissors") or \
         (user_choice == "paper" and
computer_choice == "rock") or \
         (user_choice == "scissors" and
computer_choice == "paper"):
        print("You win! 🎉")
    else:
        print("You lose! 😵")

# Run the game
play_game()
```

Java Code: Rock-Paper-Scissors Game

```
import java.util.Scanner;
import java.util.Random;

public class RockPaperScissors {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Random random = new Random();

        String[] choices = {"rock", "paper", "scissors"};

        System.out.println("Welcome to Rock-Paper-Scissors!");
        System.out.print("Enter rock, paper, or scissors: ");

        // Get user input
        String userChoice = scanner.next().toLowerCase();

        // Validate input
        if (!userChoice.equals("rock") && !userChoice.equals("paper")
&& !userChoice.equals("scissors")) {
            System.out.println("Invalid choice! Please enter rock, paper, or
scissors.");
            return;
        }

        // Get computer choice
        String computerChoice = choices[random.nextInt(3)];

        // Display choices
        System.out.println("You chose: " + userChoice);
        System.out.println("Computer chose: " +
computerChoice);

        // Determine winner
        if (userChoice.equals(computerChoice)) {
            System.out.println("It's a tie!");
        } else if ((userChoice.equals("rock") &&
computerChoice.equals("scissors")) ||
                (userChoice.equals("paper") &&
computerChoice.equals("rock")) ||
                (userChoice.equals("scissors") &&
computerChoice.equals("paper"))) {
            System.out.println("You win! 🎉");
        } else {
            System.out.println("You lose! 😢");
        }

        scanner.close();
    }
}
```

Java Code: Simple Calculator

```
import java.util.Scanner;

public class Calculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Display menu
        System.out.println("Simple Calculator");
        System.out.println("Select operation:");
        System.out.println("1. Add");
        System.out.println("2. Subtract");
        System.out.println("3. Multiply");
        System.out.println("4. Divide");

        // Get user choice
        System.out.print("Enter choice (1/2/3/4): ");
        int choice = scanner.nextInt();

        // Get two numbers from the user
        System.out.print("Enter first number: ");
        double num1 = scanner.nextDouble();
        System.out.print("Enter second number: ");
        double num2 = scanner.nextDouble();

        // Perform calculation based on user choice
        double result = 0;
        boolean validOperation = true;

        switch (choice) {
            case 1:
                result = num1 + num2;
                System.out.println("Result: " + num1 + " + " + num2 + " = " + result);
                break;
            case 2:
                result = num1 - num2;
                System.out.println("Result: " + num1 + " - " + num2 + " = " + result);
                break;
            case 3:
                result = num1 * num2;
                System.out.println("Result: " + num1 + " * " + num2 + " = " + result);
                break;
            case 4:
                if (num2 != 0) {
                    result = num1 / num2;
                    System.out.println("Result: " + num1 + " / " + num2 + " = " +
result);
                } else {
                    System.out.println("Error: Cannot divide by zero!");
                }
                break;
            default:
                validOperation = false;
                System.out.println("Invalid choice! Please enter 1, 2, 3, or 4.");
        }

        scanner.close();
    }
}
```