CHALLENGE 1: Hello World Plus

Goal: Understand program structure and output.

Requirements

- Print:
    - Your name
    - Age
    - Country
- Each on a new line

Constraints

- Use only printf
- Include comments explaining each line

Concepts Learned

- #include <stdio.h>
- main() function
- Compilation process

Example Output

Name: Alex

Age: 20

Country: India

CHALLENGE 2: User Input Program

Goal: Learn input/output.

Requirements

- Ask the user for:
    - Name
    - Age
    - Salary
- Print them back neatly

Constraints

- Use scanf
- Correct format specifiers (%d, %f, %s)

Concepts Learned

- Input handling
- Format specifiers

CHALLENGE 3: Basic Calculator

Goal: Practice conditionals.

Requirements

- Take two numbers
- Take an operator (+ - * /)
- Perform calculation

Constraints

- Handle division by zero
- Use switch

Concepts Learned

- switch-case
- Error handling

CHALLENGE 4: Number Analyzer

Goal: Logical thinking.

Requirements

- Input a number
- Check:
    - Even or odd
    - Prime or not
    - Positive, negative, or zero

Constraints

- Use loops for prime check

Concepts Learned

- Loops
- Conditional logic

CHALLENGE 5: Pattern Printer

Goal: Master nested loops.

Requirements

Print:

*

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Constraints

- Use nested for loops only

Concepts Learned

- Loop control
- Pattern logic

CHALLENGE 6: Array Operations

Goal: Understand arrays.

Requirements

- Read n elements into array
- Find:
    - Sum
    - Average
    - Largest
    - Smallest

Constraints

- No hardcoded array size

Concepts Learned

- Arrays
- Iteration

CHALLENGE 7: String Manipulation

Goal: Work with strings.

Requirements

- Input a string
- Perform:
    - Reverse string
    - Count vowels
    - Check palindrome

Constraints

- Do not use library functions for reverse

Concepts Learned

- char arrays
- String traversal

CHALLENGE 8: Student Record System

Goal: Learn structures.

Requirements

- Store:
    - Name
    - Roll number
    - Marks
- Calculate grade

Constraints

- Use struct
- Store multiple students

Concepts Learned

- Structures
- Data organization

CHALLENGE 9: Function Library

Goal: Modular programming.

Requirements

- Create functions for:
    - Add
    - Subtract
    - Multiply
    - Divide
- Call them from main

Constraints

- Each function must return a value

Concepts Learned

- Functions
- Reusability

CHALLENGE 10: Pointer Mastery

Goal: Core C skill.

Requirements

- Swap two numbers using pointers
- Print addresses and values
- Traverse array using pointers

Constraints

- No array indexing allowed

Concepts Learned

- Pointers
- Memory addresses

CHALLENGE 11: File Handling Program

Goal: Persistent storage.

Requirements

- Write text to a file
- Read text from file
- Append new text

Constraints

- Handle file open errors

Concepts Learned

- FILE *
- fopen, fprintf, fscanf

CHALLENGE 12: Mini Project – Banking System

Goal: Combine everything.

Features

- Create account
- Deposit
- Withdraw
- Check balance
- Save data to file

Constraints

- Use:
  - struct
  - Pointers
  - File handling
- Menu-driven program

Concepts Learned

- Real-world C programming
- Data persistence
- Program architecture