# CPP-A08: Function Assignment

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## 1. Smart Calculator (Loop Until Exit)

**Problem:**

Create a calculator program that provides the following choices to the user:

1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Find the remainder
6. Exit

The program should keep executing until the user selects the **Exit** option. Each operation should be implemented using a separate function.

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## 2. Student Grade Calculator

**Problem:**

Write a C++ program that takes marks for **5 subjects** as input from the user and calculates the **percentage** and **grade** using functions:

- **calculatePercentage()** → Computes the percentage
- **assignGrade()** → Assigns grade based on percentage
  - 90-100: A+
  - 80-89: A
  - 70-79: B
  - 60-69: C

- 50-59: D
- Below 50: Fail

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## 3. Temperature Converter

**Problem:**

Create a menu-driven program that converts temperatures between different units:

1. Celsius to Fahrenheit
2. Fahrenheit to Celsius
3. Celsius to Kelvin
4. Exit

Each conversion should be done using separate functions. The program should continue running until the user chooses **Exit**.

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## 4. Number System Converter

**Problem:**

Write a program that allows users to convert numbers between different number systems:

1. Decimal to Binary
2. Decimal to Octal
3. Decimal to Hexadecimal
4. Binary to Decimal
5. Exit

Each conversion should be implemented as a separate function.

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## 5. Bank Transaction System

**Problem:**

Simulate a bank transaction system with the following options:

1. Check Balance
2. Deposit Money

3. Withdraw Money
4. Exit

The program should use functions to handle each operation. The balance should be updated accordingly.

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## 6. Prime Number Operations

**Problem:**

Write a menu-driven program with the following choices:

1. Check if a number is Prime
2. Print all prime numbers in a given range
3. Exit

Each choice should be implemented using a separate function.

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## 7. Armstrong Number Checker

**Problem:**

Write a program that checks if a given number is an **Armstrong number** using a function.

Example:

- **153** →  (Armstrong number)

  13+53+33=1531^3 + 5^3 + 3^3 = 153
- **123** → Not an Armstrong number

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## 8. Matrix Operations

**Problem:**

Create a program that provides the following operations on **2D matrices**:

1. Addition of two matrices
2. Subtraction of two matrices
3. Multiplication of two matrices
4. Transpose of a matrix
5. Exit

Each operation should be implemented as a function.

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## 9. String Operations

**Problem:**

Create a menu-driven program for string operations:

1. Find the length of a string
2. Convert string to uppercase
3. Convert string to lowercase
4. Reverse a string
5. Exit

Each operation should be handled using a function.

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## 10. Factorial & Fibonacci Generator

**Problem:**

Create a program that provides the following operations:

1. Calculate the factorial of a number
2. Print the first N Fibonacci numbers
3. Exit

Each operation should be implemented using a separate function.

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Happy Coding!