# C Language

# Exercise 1

## ✅ PART 1: Code Correction

The following code has **5 mistakes**. Correct them to make the program run and show

`sum = 15`.

```c
#include <stdio.h>
#include <stdbool.h>

int main() {
    int a = 7
    int b = 8;
    int sum;

    sum = a + b;
    printf("The sum is: %f\n", sum);

    return
}
```

> 💡 **Hints**:
>
> - Look at missing symbols
>
> - Check format specifier
>
> - Check return statement

---

## ✍️ PART 2: Fill in the Blanks

Complete the blanks to declare variables and take user input correctly.

```c
#include <stdio.h>
#include <stdbool.h>
```

```c
int main() {
    int age;
    char name[20];

    printf("Enter your name: ");
    scanf("____", name);

    printf("Enter your age: ");
    scanf("____", &age);

    printf("Hello %s, you are %d years old.\n", ____, ____);

    return 0;
}
```

🧠 **Challenge**: Replace blanks using correct format specifiers for string and integer input/output.

---

## 🧪 PART 3: Predict the Output

What will be the output of the following code snippet?

```c
#include <stdio.h>
#include <stdbool.h>

int main() {
    bool isPassed = true;
    printf("Result: %d", isPassed);
    return 0;
}
```

❓ **Your Answer**: _____

💡 **Tip**: `true` and `false` are stored as `1` and `0` in C.

---

## 🔧 PART 4: Modify the Code

**Task**: Modify the original program you were given to **perform addition, subtraction, multiplication or division** based on the operator the user selects.

✅ Add an `if-else` structure to do the following:

```
if (op_new == '+') {
    printf("Result = %d\n", x + y);
} else if (op_new == '-') {
    // Complete this block
}
```

🔍 **Test Cases to Try**:
Operator: + with x=7, y=3 → Output: 10
Operator: / with x=10, y=0 → Handle divide-by-zero error

---

## 🧠 PART 5: Conceptual Questions

1. What is the difference between `float` and `double` in C?

2. What does the `%c` format specifier do in `printf`?

3. What is the output of `printf("%d", false);`?

4. Can you declare and initialize a `string` in C like Python? Why or why not?

5. What is the purpose of using `char message[] = "Hello";` instead of `char *message = "Hello";`?

---

## 🏆 PART 6: Mini Project Task

🔧 **Task**: Convert the last portion of your code into a **Simple Calculator App in C**.

- Ask the user to input two numbers and an operator (`+`, `-`, `*`, `/`)

- Perform the operation and display the result

- Add error checking for:

    ○ Invalid operator

- Division by zero