Lab Practice Problem 1

Filename: `practice1_surname.c`

In this activity, you will practice reading input from the user, storing results into variables, performing arithmetic operations, and printing results in C. Write a program that prompts the user to enter two numbers, `A` and `B`. Then, compute and display the following results:

- The sum (`A + B`) using addition
- The difference (`A - B`) using subtraction
- The product (`A * B`) using multiplication
- The quotient (`A / B`) using division

Try It Out

Declare two variables using the integer data type (`int`). For each operation, ensure that your program prints a clear and descriptive message along with the result. A sample run is provided below. Anything that is underlined represents user input.

Sample Run

```
Enter the first number: 12
Enter the second number: 4
Sum: 16
Difference: 8
Product: 48
Quotient: 3
```

Guide Questions

1. Test your program with the inputs `15` and `2`. What does the output look like? Pay special attention to the result of the division operation.
2. Test your program with the inputs `10` and `0`. What happens in this case?
3. Modify your program so that it also outputs the remainder of the division. For example, if the inputs are `15` and `2`, the program should display a remainder of `1`.
4. Recall that a number can be either a whole number or one with a decimal part. Change the variable type from `int` to `double`. Be sure to also update the format specifier in your `scanf` and `printf` statements (from `%d` to `%lf`). After making these changes, what differences do you notice in the arithmetic results? Finally, how can you format the output so that it always shows exactly 4 digits after the decimal point?
5. Suppose you assign the result of the expression `A + B - A * B / A` to a variable called `result`. What value do you expect will be stored in the variable? If both `A` and `B` are integers, does it matter what data type `result` must be declared? For example, would declaring it as an `int` lead to a different outcome than declaring it as a `double`?

Sample Solution

```c
#include <stdio.h>

int main(void) {
    // declare all the local variables here
    int a, b;
    int sum, diff;

    printf("Enter the first number: ");
    scanf("%d", &a);
    printf("Enter the second number: ");
    scanf("%d", &b);

    // for the extra line
    //printf("\n");     // removed in the updated version of the document

    // try storing results in a variable
    sum = a + b;
    printf("Sum: %d\n", sum);

    diff = a - b;
    printf("Difference: %d\n", diff);

    // directly perform the computation in the printf
    printf("Product: %d\n", a*b);
    printf("Quotient: %d\n", a/b);

    // double a, b;
    // printf("Enter the first number: ");
    // scanf("%lf", &a);
    // printf("Enter the second number: ");
    // scanf("%lf", &b);

    // printf("Sum: %.4lf\n", a+b);
    // printf("Difference: %.4lf\n", a-b);
    // printf("Product: %.4lf\n", a*b);
    // printf("Quotient: %.4lf\n", a/b);

    // assuming both a and b are int
    int result = a + b - a * b / a;
    printf("Result: %d\n", result);

    return 0;
}
```