Task 1G: Function Pointer Usage in C

Objective:
To understand and demonstrate the use of function pointers in C. This task defines multiple arithmetic functions and passes them as arguments to another function using a function pointer to ensure the correct function is invoked at runtime.

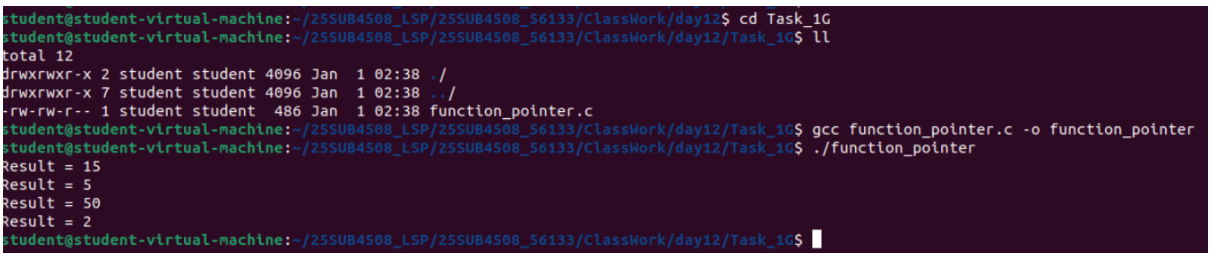
1. Program Code

```
#include <stdio.h>

int add(int a, int b) {
        return a + b;
}

int subtract(int a, int b) {
        return a - b;
}

int multiply(int a, int b) {
        return a * b;
}

int divide(int a, int b) {
        return a / b;
}

void operation(int (*func)(int, int), int x, int y) {
        int result = func(x, y);
        printf("Result = %d\n", result);
}

int main() {
        operation(add, 10, 5);
        operation(subtract, 10, 5);
        operation(multiply, 10, 5);
        operation(divide, 10, 5);
        return 0;
}
```

2. Compilation Instructions

Compile the program using GCC:

```
gcc -g function_pointer.c -o function_pointer
```



3. Program Output

Result = 15
Result = 5
Result = 50
Result = 2

4. Explanation

1. A function pointer stores the address of a function.
2. The operation() function accepts a function pointer and two integers.
3. Different arithmetic functions are passed to operation().
4. The function pointer invokes the correct function dynamically.

5. Conclusion

This task demonstrates how function pointers enable dynamic function calls in C. They are widely used in callbacks, event handlers, and modular programming.