Assignment 4

IDATT2503 - Security in programming and cryptography
Fall 2023

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1 Task 1

1.1 Modifications

First of all, I changed the message from `Hello World!` to `Hello World from Trondheim!`. I updated the length of the message and set the counter to `3`, instead of `10`. In order to write the message to standard error, I modified the file descriptor from `1` (standard output) to `2` (standard error). I then modified the line of code before the `syscall` to return an error code (`1`).

1.2 Verification

To test whether the program actually writes to standard error instead of standard output, I ran the following commands

```
./hello 1> hello_stdout.txt
./hello 2> hello_stderr.txt
```

and checked the output to make sure that the `stdout` file was empty, whereas the `stderr` file contained the 3 sentences.
To verify the return of the error code, after the execution of the program I ran the command

```
echo $?
```

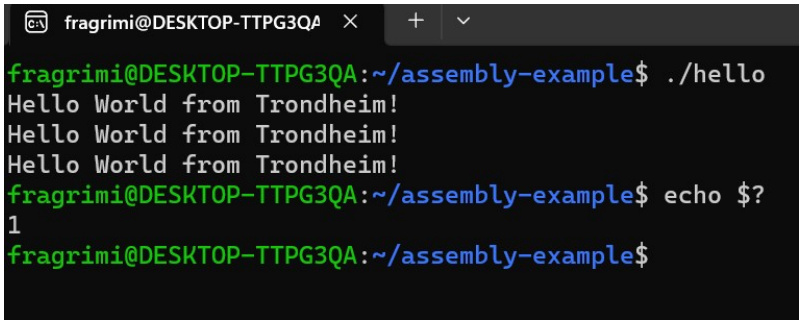

Figure 1: Error code in Task 1

2 Task 2

The outputs of the three programs written respectively in C, C++ and Rust, are the following:

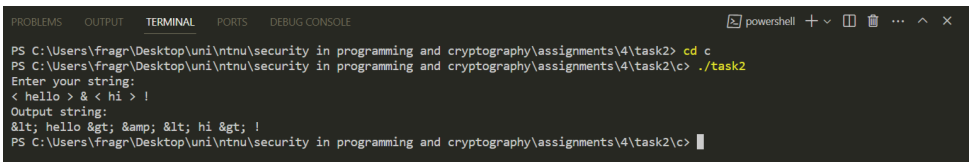

Figure 2: Output of C program

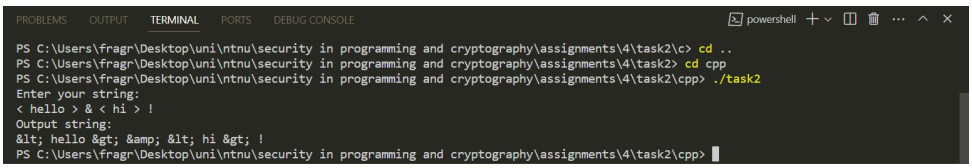

Figure 3: Output of C++ program

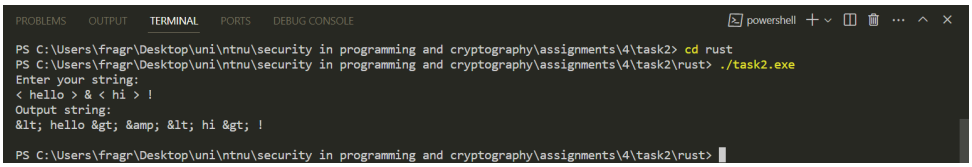

Figure 4: Output of Rust program

3 Task 3

After creating the dynamic library and linking it to the executable file, this is the output:

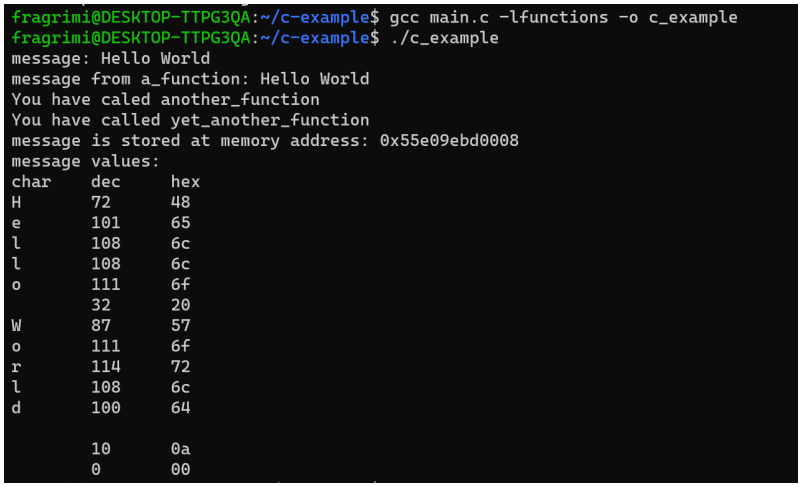

Figure 5: Output with spelling error

It is clear that there is a spelling error in the function named `another_function` ("`caled`"). Fixing it and updating the dynamic library produces the following result when running `c_example` again:

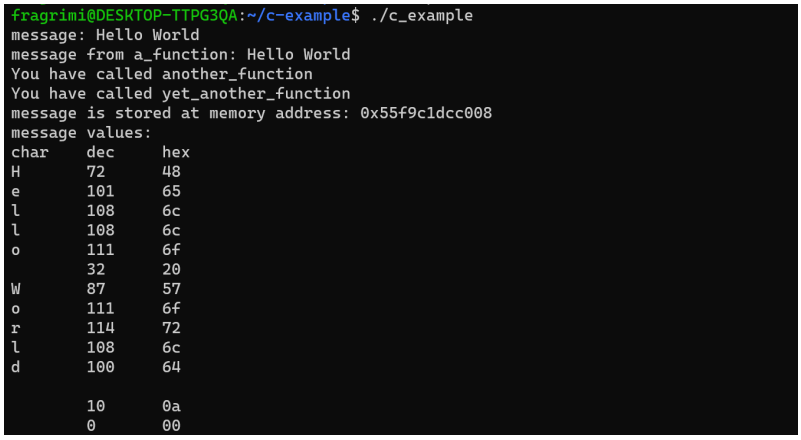

Figure 6: Output with fixed typo

To see the changes, there is no need to recompile `c_example`.