CS6570 - Secure Systems Engineering: Assignment-1

Submission guidelines

- **Deadline: 12th February 2024**
- We expect you to write and submit a pdf report (preferably in LaTeX)
- The report should contain the following things compulsarily:
    - Your Name and Roll-Number.
    - Explain the functioning of the code **"shell.c"** (example code disuccused in class).
    - Explain the output of the code or what minimal changes should be made to "shell.c" such that it works when compiled with ***gcc*** (provided **Makefile**).
    - Justify and highlight the changes made to the code if any and provide supporting screenshots of successful runs.
    - How does your compiled binary differ from the provided binary **"shell_clang"**?
    - Why does the provided binary work as intended even when it is compiled from the orignal source file "shell.c" using ***clang*** instead of *gcc*?

Files provided

- Makefile
- shell.c
- shell_clang (working example)

How to compile with gcc and run the binary?

- Install gcc-mulitlib for compiling 32-bit binaries with the below command (follow on-screen prompts for resolving dependency errors)
  `sudo aptitude install gcc-multilib`

- Run the below command to compile "shell.c" with *gcc* (read Makefile to know about the compilation flags used)
  `make`

- Run the compiled program
  `./shell`

Working example

- We have also provided a compiled binary "shell_clang" compiled with *clang* using the Makefile (replace *gcc* with *clang*).
- You can also compile "shell.c" with *clang* to verify this yourself.

General Guidelines

- Please ensure that your results and observations of the modified code run on the course VM.
- Using *GDB* is suffecient for solving this assignment, you are also free to use other tools if you wish.
- The internet is your friend, there a lot of excellent resources available (please properly reference any extra tools/ repositories used).