**Introduction**

In this assignment you have to implement a UNIX shell using C. Your shell will be able to run basic linux commands, I/O redirections and handle errors.

**Specifications**

The shell must implement the following core features:

1. Display a command prompt (e.g., sh> ) and read user input.
2. Parse and execute system commands.  
   For example, running “pwd” will output the absolute path of the directory that your shell is working on.  
   **Hint**: Use “fork” and “exec” system call
3. Support input (<) and output (> and >>) redirection.  
   **Hint**: Use “dup” and “dup2”
4. Support command piping (|). Your shell should support any number of piping.  
   For example, “command1 | command2 | command3 | command4” should work
5. Support multiple commands in-line separated by semicolon (;)
6. Support multiple command in sequence using (&&)
7. Support history of executed commands
8. Support signal handling. Pressing CTRL+C should terminate the currently running command inside your shell, not your shell.  
   **Hint**: Use “signal” and “sigaction”

**Mark Distribution**

| **Features** | **Marks** |
| --- | --- |
| Basic shell functionality & built-in command support | 40 |
| Redirection (<, >, >>) | 15 |
| Piping (|) | 15 |
| Signal handling | 15 |
| Logical opt. in terminal | 10 |
| History | 5 |
| **Total** | **100** |

**Submission Guideline**

* Submission guidelines can be found in the submission form.

**Collaboration Policy**

* This project is a group assignment. A group can consist of at most 3 people. The difficulty of the project will be adjusted according to the number of people in the group. Discussions are encouraged, but direct code sharing is prohibited.
* Plagiarism will result in penalties according to university policies.