Operating Systems (40424)

- Academic Year: 2023-2024, Second Semester
- Course Instructor: Dr. Rasoul Jalili
- Department: Computer Engineering

Rules and Notes

1. The project must be done and submitted individually.
2. You can submit the project within three days after the deadline. A 25% penalty will be applied to the earned score for each day of delay, up to a maximum of 12 hours per day.
3. Submit your answers in a file named in the format: `OS_Prj1_StdNum_FirstName_LastName`.

Project Requirements

- This project requires you to write a shell for the Linux operating system that works in the Persian language. Use the C programming language.
- Only use the main libraries of the C language and the main libraries of the operating system. The use of other libraries is not allowed.
- Before each command entry, the shell should display the username, hostname, and the current path as follows:

```
{userName}@{hostName}-{path}$
```

- **The shell you write must have the following capabilities**:

  1. It must be able to set a local variable with the following command.

     ```
     >>> set {var} = {value}
     ```

  2. It must be able to get the value of a local variable with the following command.

     ```
     >>> get {var}
     ```

  3. It must be able to execute all executable files in the PATH local variable.
     Only programs that have execution permission should be executable. Commands can be in Persian or English. If the user enters a command with a path instead of a command name, the shell should ignore the PATH content and try to find the file in the provided path. For example:

     ```
     >>> ls .
     >>> /bin/ls .
     ```

  4. It should be able to show the content of a directory with the following command.

     ```
     >>> ls {path}
     ```

  5. It should be able to switch between directories with the following command.

     ```
     >>> cd {path}
     ```

  6. It should be able to display the content of a file with the following command.

     ```
     >>> cat {path/to/file}
     ```

7. It should display the directory content respecting the privacy. In this case, it should display the contents of the directory, but replace the last six letters of each file and directory with `_`.

```
>>> hls
```

8. It should be able to run a program in the background.

```
>>> {command} &
```

9. It should be able to save the output of a command to a file.

```
>>> {command} > {path/to/file}
```

10. By putting the `$` sign at the beginning of a variable name, that name is considered as a local variable and its value is replaced

```
>>> ${var}
```

for example:

```
>>> set mycommand = ls
>>> $mycommand
```

The result of executing the `ls` command should be returned in this way.

NOTE: Your shell must support all other Ubuntu shell commands too.

Good Luck!