Assignment #4 Part 1: Exploration of Linux

Due Date: Friday, February 18 at 11:59 PM

Type of Assignment: Individual

Submission Procedure:

Upload a PDF of your assignment report to your private git repository in the directory `Assignments/Assignment_4/Part_2/Submission`.

Instructions:

Complete the following. For each part that requires bash commands, copy and paste the commands and output into your report. If a part requires you to answer a question, type the answer to the question into your report.

1. Log into your CSCI OpenStack account, and open a terminal window. Enter the command to show the directory contents.
2. Get the directory listing showing all files (including hidden files) within the directory in a "long" format.
3. For each file listed in the long format, what do each of the first ten characters imply?
4. Assess the file system disk usage in a "human readable" format.
5. Examine the contents of the `/bin` directory. Choose five programs that you do not know and determine what they do and how they are used by employing bash commands.
6. Complete the following tasks:
    - Create a folder in your home directory called `ASEN4057`.
    - Within this new directory, create a text file called `asen4057test.txt`.
    - Within this file, include your name, class year, favorite movie, and favorite video game.
    - Change the permissions on this file so that you, the user, has read, write, and execute permissions.
    - Show all the contents (including hidden files) of the `~/ASEN4057` directory in a long format.
    - Display the contents of `asen4057test.txt` using the `cat` command.
    - Move `asen4057test.txt` to your home directory and verify it is there.
    - Rename the file to `asen4057.txt` and verify it has changed.
    - Delete the file and verify it has been deleted.
7. Complete the following tasks:

- Create a new directory in the `ASEN4057` directory called `hello_world`.
- Within this new directory, create a text file called `hello_world.c`.

```
/*
 * File: hello_world.c
 * Author: [Insert your name here]
 /\

 /* Include preprocessor directives*/
#include <stdio.h>
#include <stdlib.h>

int main(int argc, char** argv)
{
        // print "Hello World" to terminal

        printf("Hello World!\n");

        return (EXIT_SUCCESS);
}
```

- Compile the code and create an executable file called `hello_world` using gcc.

  ```
  gcc hello_world.c -o hello_world
  ```

- Verify that you have execute permission on the `hello_world` executable.
- Run your code and verify the output in the terminal.

  ```
  ./hello_world
  ```

- Move to your home directory and run your `hello_world` program from your home directory.

8. Where is the actual executable for `gcc` located? Why can you use `gcc` without the full pathname from the command line?

9. In what directories does the bash shell search for programs to run on your CSCI OpenStack Instance? Where is that information stored? Can it be changed?

10. Using only a single command line instruction with pipes and redirection, take the combined contents of `/bin` and `/usr/bin`, sort them, and write them to a file in the `~/ASEN4057` directory called `usefulprograms.txt`.

11. Determine the default terminal for your session, and where the environment variable storing this information is set.

12. Verify that there is no default editor currently associated with your session. Fix this by assigning a default editor (e.g., `nano` or `vim`) at login. Describe the fix.

    Hint: The editor is an environment variable.