Assignment #2

NES 595, Fall 2018, Dr. Ahmad T. Al-Hammouri

**Due date: Tuesday 16/10/2018 at 11:55pm.**

Student Names & IDs: Group #: .

**Objectives:**

* To explore and *master* the UNIX traditional and special permissions.

**Part I. Traditional UNIX permissions:**

1. As a regular user with regular permissions (i.e., no sudo), create a subdirectory, temp, inside your home directory. Then, create a file, a.txt (e.g., with touch), **inside** temp.

**Question 1.** What are the commands? *Provide* *an appropriate screenshot of the commands and their effect.*

1. Change the permissions of a.txt to **grant** **full** access to it to **everybody** on the system. Then, change the permissions of temp to **prevent** **all** access to it to **all** accounts on the system.

**Question 2.** What are the commands? *Provide* *an appropriate screenshot of the commands and their effect.*

**Question 3.** Can you list the contents of temp (with ls -all)?

**Question 4.** Can you create another file, b.txt, inside temp?

**Question 5.** Can you change the current directory (with cd) into temp?

**Question 6.** Can you list the contents of a.txt (with less ./temp/a.txt)?

**Question 7.** What are the **MINIMUM** permissions to be given to temp to allow the owner to list its contents (i.e., display *complete* information about the contained file(s))? What is the command to achieve this? *Provide* *an appropriate screenshot showing the command and the effect, i.e., your test cases.*

**Question 8.** What are the **MINIMUM** permissions to be given to temp to allow the owner to create another file, b.txt, inside it? What is the command to achieve this? *Provide* *an appropriate screenshot showing the command and the effect, i.e., your test cases.*

**Question 9.** What are the **MINIMUM** permissions to be given to temp to allow the owner to cd into it? What is the command to achieve this? *Provide* *an appropriate screenshot showing the command and the effect, i.e., your test cases.*

**Question 10.** What are the **MINIMUM** permissions to be given to temp to allow the owner to list the contents of a.txt (less ./temp/a.txt)? What is the command to achieve this? *Provide* *an appropriate screenshot showing the command and the effect, i.e., your test cases.*

**Question 11.** Suppose you have the following directory structure ~/dir1/dir2/dir3/dir4. Also, suppose that the permissions on each of dir1, dir3, and dir4 are rwxrwxrwx, and on dir2 are ---------. What kind of access, i.e., what are the operations, you can perform on dir4?

1. Create a subdirectory, planetearth, inside the /home directory. (This requires administrative privileges, i.e., via sudo.)
2. Create **two** user accounts, adam, and eve.

**Question 12.** What are the commands? *Provide* *an appropriate screenshot showing the command and its effect.*

1. Configure the permissions, directory ownership, and group ownership such that
   * eve has **full** access on planetearth,
   * adam can **only list** the contents of planetearth, and
   * all other system accounts have **no** whatsoever access on planetearth.

**Question 13.** What are the commands? *Provide* *an appropriate screenshot showing the commands and their effect, i.e., your test cases.*

(**Hint**: *you can switch users without actually logging out and then logging in on the machine with a different user by utilizing the command* su -l newusername.)

**Part II. Special Permissions:**

1. As a regular user with regular permissions (i.e., no sudo), list the contents of the /etc/passwd file with the less command.

**Question 14.** Who is the owner of the less program/binary **file**? Which group does own it? What are the permissions of it? *Provide* *the appropriate screenshot.*

**Question 15.** What are the UID and GID associated with the **running** less command (i.e., the process) above? What are the corresponding user name and group name? *Provide* *the appropriate screenshot.*

(**Hint**: *on another terminal, issue the command* ps -A -o pid,cmd,user,group,uid,gid.)

1. As a regular user with regular permissions, list the contents of the /etc/shadow file with less command.

**Question 16.** What is the output? *Provide* *the appropriate screenshot.*

**Question 17.** Briefly explain why you are getting such output*.*

1. Set the setuid bit on the less (keeping other permissions the same).

**Question 18.** What is the command? *Provide* *an appropriate screenshot showing the command and its effect.*

1. As a regular user with regular permissions, list the contents of the /etc/shadow file with less command.

**Question 19.** What is the output? *Provide* *an appropriate screenshot showing the command and its effect.*

**Question 20.** What are the UID and GID associated with the **running** command (process) above? What are the corresponding user name and group name? *Provide* *the appropriate screenshot.*

1. Restore the original permissions on the less.

**Question 21.** What is the command? *Provide* *an appropriate screenshot showing the command and its effect.*

**Question 22.** Enumerate all binaries/programs on your machine that have the setuid bit set on them. What is the command? *Provide* *an appropriate screenshot showing the command and its output.*

1. As a regular user with regular permissions, create two subdirectories inside your home directory, temp1 and temp2.
2. Create a group, programmers, and **add** your user name to programmers. Then, change **group owner** for **both** temp1 and temp2 to programmers.

**Question 23.** What are the commands? *Provide* *an appropriate screenshot showing the commands and their effect.*

1. Set the setgid bit on temp2 **only** (keeping other permissions the same).

**Question 24.** What is the command? *Provide* *an appropriate screenshot showing the command and its effect.*

1. As a regular user with regular permissions, create a subdirectory inside temp1 and a subdirectory inside temp2. Also, create a file (e.g., with touch) inside temp1 and a file inside temp2.

**Question 25.** What are the commands? *Provide* *an appropriate screenshot showing the commands and their effect.*

**Question 26.** Who is the owner of the subdirectory and file inside temp1? Which group does own them? What are the permissions of both? *Provide* *the appropriate screenshot.*

**Question 27.** Who is the owner of the subdirectory and file inside temp2? Which group does own them? What are the permissions of both? *Provide* *the appropriate screenshot.*

1. After switching to user eve you created in Part I above, create a file, eve.txt, **inside** the /tmp directory. Also, after switching to user adam, create a file, adam.txt, **inside** the /tmp directory.

**Question 28.** What are the permissions of /tmp?

**Question 29.** Can eve delete adam.txt (with rm -f /tmp/adam.txt)? Can adam delete eve.txt?

1. **Unset** the **sticky** bit on /tmp while keeping other permissions the same.

**Question 30.** What is the command? *Provide* *an appropriate screenshot showing the command and its effect.*

**Question 31.** Can eve delete adam.txt (rm -f /tmp/adam.txt)? Can adam delete eve.txt?

1. Restore the sticky bit on /tmp.

**Question 32.** What is the command? *Provide* *an appropriate screenshot showing the command and its effect.*

**Deliverables:**

Answer all questions (1–32) above, provide the required *appropriate* screenshots, and upload the file to the elearning via the provided link. Do **NOT** send it via e-mail or a message from within the elearning *even before the deadline* ***because it will be deleted tacitly***.