Assignment #4

Date Due: November 29, 2019

Total: 100 marks

To change ownership of a file you need root access. Also for using system files. For this assignment your root file system `$ROOTFS` is considered to be `/home/sysp/users/groups/cs2820/A4` Thus `/etc/passwd` in your exercise is in fact `${ROOTFS}/etc/passwd`. Your `${ROOTFS}/etc/passwd` and `${ROOTFS}/etc/group` will be created from the tar archive provided.

Don't use root access to test any of the exercises in this assignment.

1. (20 marks) One task of a system administrator is to recover files from an unexpected intrusion into the system. Your system has been compromised by an attack that changed the name of the files, changed permissions, and mixed their parent directories. However, these files were well maintained by their authors and each of them contains a header as follows:

```
Author: Name Surname
Name: File_name
Institution: UPEI
Permissions: rwxr-xr-x
Type: text file
Last modified: March 15, 2012 AST
License: None
bal bla bla
   the content of the file
```

Some files are shell scripts, therefore the first line contains the path to interpreter and the following lines, containing the header, are commented.

Some files are C,C++, or java programs, therefore the first lines, containing the header, are commented (using either // or /* */).

You are asked to write a shell script, to recover data.

   (a) C shell script 55 marks, (first script: `r1.csh`)

   (b) Bourne shell 55 marks, (second script: `r2:sh`)

File having different authors should be placed in different directories; all files having the same author should be place the same directory. The name of the directory should be relevant to the name of the author. Your script should be able to add to the description of the header the owner and the group of recovered file – *in case it is missing*. In case this information cannot be found you can create/assign to a new group and/or user.

You can create additional "helper" scripts to achieve your goal.

However, you must run just one script for recovering files from a given location and save them into another location.

Marking scheme:

(a) (10 marks) Placing into the same directory all files having the same author.

(b) (10 marks) Changing permissions to the right ones.

(c) (10 marks) Identifying the uid and gid for each file and adding missing ones (+5 marks).

(d) (10 marks) Handling comments for each file type (scripts, C/java/C++).

(e) (10 marks) Adding to the description of the header the owner and the group of recovered file. *If the owner and the group is set, you should not change it.* You should not attempt to change the ownership of the file.

(f) (10 marks) Your scripts must perform well on "`A4/Samples`" files provided. The result of the run should be included in your submission (files and the textfile with the demonstration).

(g) In addition to the marks from the scripts, creating one set of test data is 7 marks. Run your scripts proving they work

   i. Each set of data should contain at least 4 different file as ASCII/text files

   ii. Each set of data should contain at least 2 different shell scripts

   iii. Each set of data should contain at least 3 different C/C++/java programs

   You should generate between two and three sets of test data.

   Put your test data into subdirectory `A4-$name-$stdid`, where `$name` is your name, `$stdid` is your student id. (by capturing the text in your terminal).