

Homework 1

cs3157 – Advanced Programming
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Due: Oct 2 midnight.

Objective:

1. Practice with some theory.
 2. Practice with some Perl coding/compiling/debugging
 3. Get a taste of what Security programmers do.
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Theory:

- 1) Give three main differences between Perl and cpp or java.
- 2) What was the most frustrating part of the assignment?
- 3) What is the \$' symbol used for in Perl?
- 4) What is TRIPWIRE?

Programming Part:

Someone has hacked into your computer and manipulated some set of files!!! That is very bad! (I was teaching a class at the time, so you can't pin this on your instructor).

One trick of finding out which file was changed is to compute a unique signature of a file, and compare it to an earlier signature which we already have seen. If the signature is not the same, it is an indication that something was changed. (Note we can manipulate a file without changing its size, so size is not an indication).

So you will need to create the following Perl program:

- 1) Name it security.pl
- 2) You will be judged on comments too! So please remember to document what you are doing.

- 3) For either bad arguments passed to your program or -?
Print out the correct arguments (see 4) and quit.
- 4) It should work in the following manner:
 - a. security.pl -snapshot *PATH* -output *NAME*
will recursively run through the location specified by *PATH*. For each file or directory you will need to take it's MD5 hash, and keep track of it in a file called *NAME*
example: security.pl -snapshot c:\temp -output TEST1
will start at c:\temp and go down to all files there, and put the output into a file named TEST1
 - b. security.pl -compare *NAME1* *NAME2*
will compare two security files, for any file which has an identical MD5 signature, we can ignore. If a specific file is only in NAME1 then printout:
file: XXXXXX has been deleted
if it is only in NAME2 printout:
file: XXXXXX has been created
if a file has changed, print out
file: XXXXXX has been manipulated

TIPS:

In addition to submitting the Perl program, you will need to include a README file giving a sentence of what each file in the submission does.

Your code should never terminate unexpectedly. Check for all possible errors the user could make (non-existent file, non-existent directory, etc). When any user error occurs, exit gracefully with an appropriate error message

Code Style is graded on how easily read your source code is. For generic tips on improving your code's style, read perldoc perlstyle. Most important are three criteria: meaningful variable names, consistent and helpful indentation, and explanatory but not over-abundant comments.

Start early and Good Luck!!