Basic Shell Programming Exercises

1 Questions

Make all these scripts executable programs on your PATH.

1. Write a simple shell script that takes *any* number of arguments on the command line, and prints the arguments with "Hello " in front. For example, if the name of the script is hello, then you should be able to run it like this:

```
$ hello Nick Urbanik
Hello Nick Urbanik
$ hello Edmund
Hello Edmund
```

2. Write a simple shell script that takes two numbers as parameters and uses a while loop to print all the numbers from the first to the second inclusive, each number separated only by a space from the previous number. Example, if the script is called jot, then

```
$ jot 2 8
2 3 4 5 6 7 8
```

3. Write a script which displays "Good morning", "Good afternoon" or "Good evening", on the monitor, depending on the time of running the script.

4. Write a script which reads a number in units of seconds and converts it to the units hours:minutes:seconds and prints the result to standard output.

   Your script must prompt for re-input if a negative value is input

```
Enter number of seconds: 12345
Result:
12345 seconds in hours:minutes:seconds is 3:25:45
```

5. Suppose that the script you wrote for question 2 is called jot. Then run it calling sh yourself. Notice the difference:

```
sh jot 2 5
sh -v jot 2 5
sh -x jot 2 5
```

   Do you notice any difference in the output from last two?

6. Write a script calculate, which accepts 4 arguments a, b, c, d and prints the value of $a \times 20 - b \times 2 + c \div d$ to standard output.

   An example of executing the script:

```
$ calculate 2 12 5 2
The value of "2*20 - 12*2 + 5/2" is 18
```

7. Write a shell script that, for each `.rpm` file in the current directory, prints the name of the package on a line by itself, then runs `rpm -K` on the package, then prints a blank line, using a `for` loop.

Test your script on the files in `/home/nfs/rh-7.2-updated/RedHat/RPMS`.

> The option `rpm -K` checks that the software package is not corrupted, and is signed by the author, if you have imported the author's public key with the command:
>
> ```
> $ cd /home/nfs/redhat-8.0
> $ sudo rpm --import RPM-GPG-KEY
> ```

8. Modify the script you wrote for the previous question to print the output of `rpm -K` *only* for *all* the files that fail the test. In particular, if the package's GPG signature fails, then your script should display the output of `rpm -K`. There are at least two packages in this directory which do not have a valid GPG signature; one of them is `redhat-release-7.2-1.noarch.rpm`; what is the other?

Here is output from `rpm -K` for two packages, one with no GPG signature, the other with:

```
$ rpm -K redhat-release-7.2-1.noarch.rpm bash-2.05-8.i386.rpm
redhat-release-7.2-1.noarch.rpm: md5 OK
bash-2.05-8.i386.rpm: md5 gpg OK
```

Test it in the same network directory as for the previous question.

9. Write a shell script to add a local group called `administrator` if it does not already exist. Do not execute any external program if the `administrator` group already exists.

10. Download a copy of the bogus student registration data from `http://ictlab.tyict.vtc.edu.hk/snm/lab/regular-expressions/artificial-student-data.txt`. Use this for the following exercises, together with the `grep` program:

- **(a)** Search for all students with the name "CHAN"
- **(b)** Search for all students whose student number begins and ends with 9, and with any other digits in between.
- **(c)** Search for all student records where the Hong Kong ID has a letter, not a number, in the parentheses.
- **(d)** Do the same exercises, but display only the students' names, or student number. You will need a program such as `awk` (or even `cut`) to select the appropriate columns from the output of `grep`.

11. Write a shell script to take a file name on its command line, and edit it with `sed` so that every instance of "`/usr/local/bin`" is changed to "`/usr/bin`"

12. Write a shell script to take a file name on its command line, and edit it using `sed` so that every line that begins with the string `server`:

```
server other text
```

is edited so that averything after "`server` " (i.e., the "*`other text`*") is replaced with the string "`clock.tyict.vtc.edu.hk`", so that the line above looks like this:

```
server clock.tyict.vtc.edu.hk
```

Test this on a copy of the file `/etc/ntp.conf` that is on your computer. (Install the package `ntp` if it is not there).