Homework 2 - Manipulating Files on Linux

Due Thursday 9/5 11pm

Throughout the semester, we will be writing programs in C on a linux platform. In particular, we will use the linux machines in W204 lab. This assignment shows you how to copy a file to and from your account on W204 machine, how to navigate in the file directories on a linux machine, how to use `tar` to unpack a package and repack a package.

Follow the steps below to copy week01.tar file you download from Canvas from your own computer to W204, untar and make to create all the binary files in it, and tar it up to week01bin.tar. Copy week01bin.tar from W204 back to your own computer, then submit it to gradescope.

Setting up a 311 folder on W204

1. Logging onto W204

Use instructions from hw1 to log on to W204 machine.

2. Create a folder 311 in your home directory

Enter the following command after the $ promt to create a 311 folder in your home directory

```
mkdir -p 311
```

NOTE: only for those of you **who already have a 311 folder from the previous semester**, do the following command to change its name **before** creating a new 311 folder.

```
mv 311 old311
```

3. Confirming you have the directory created

Enter the following command after the $ prompt to check that you have 311 folder in your home directory.

```
ls
```

4. Logging out of W204

Enter the following command after the $ prompt.

```
exit

[Yanlings-MacBook-Air:~ wangyl$ ssh yuw17@cse-p204inst10.cse.psu.edu
[yuw17@cse-p204inst10.cse.psu.edu's password:
 Duo two-factor login for yuw17

 Enter a passcode or select one of the following options:

  1. Duo Push to XXX-XXX-1909
  2. Phone call to XXX-XXX-1909
  3. SMS passcodes to XXX-XXX-1909

[Passcode or option (1-3): 1

 Pushed a login request to your device...
 Success. Logging you in...
[cse-p204inst10.cse.psu.edu 121% ls
 311  311backup  bin  pastclasses  perl5  recommendation  test  www
[cse-p204inst10.cse.psu.edu 122% mv 311 old311
[cse-p204inst10.cse.psu.edu 123% mkdir -p 311
[cse-p204inst10.cse.psu.edu 124% ls
 311  311backup  bin  old311  pastclasses  perl5  recommendation  test  www
[cse-p204inst10.cse.psu.edu 125% exit
 logout

 Connection to cse-p204inst10.cse.psu.edu closed.
 Yanlings-MacBook-Air:~ wangyl$ ▊
```

Downloading the file from canvas and copy to W204

5. Download week01.tar file from canvas

Make a note of which folder you saved the file to. Usually it is in ~/Downloads folder if you are using Mac/Linux systems, or in c: \Users\your_user_name\Downloads if you are using Windows.

6. scp local file to 311 folder on W204

```
scp ~/Downloads/week01.tar abc1234@cse-p204inst10.cse.psu.edu:311/
```

The system will prompt for you password for CSE account, and will **implicitly send you a DUO-Push to your phone (without a menu selection)** that you need to approve before the copying can happen. Make sure you check your phone for pending **Duo-Push**.

```
[Yanlings-MacBook-Air:~ wangyl$ scp ~/Downloads/week01.tar yuw17@cse-p204inst10.cse.psu.edu:311/
[yuw17@cse-p204inst10.cse.psu.edu's password:
 week01.tar                                          100%   20KB 116.5KB/s   00:00
 Yanlings-MacBook-Air:~ wangyl$ ▊
```

Logging back onto W204 to process the week01.tar

7. Logging onto W204

Follow hw1 instructions.

8. Navigate to the folder 311

Use the following command to navigate to the folder 311

```
cd 311
```

9. Checking that week01.tar is in place

Use the following command to check that week01.tar is in the folder

```
ls
```

10. Use tar utility to unpack the tar file

Use the following command to unpack the week01.tar file.

tar xvf week01.tar

11. Navigate to the folder week01

Use the following command to navigate to the folder

```
cd week01
```

```
[Yanlings-MacBook-Air:~ wangyl$ ssh yuw17@cse-p204inst10.cse.psu.edu
[yuw17@cse-p204inst10.cse.psu.edu's password:
 Duo two-factor login for yuw17

 Enter a passcode or select one of the following options:

  1. Duo Push to XXX-XXX-1909
  2. Phone call to XXX-XXX-1909
  3. SMS passcodes to XXX-XXX-1909

[Passcode or option (1-3): 1

 Pushed a login request to your device...
 Success. Logging you in...
[cse-p204inst10.cse.psu.edu 122% cd 311
[cse-p204inst10.cse.psu.edu 123% ls
 week01.tar
[cse-p204inst10.cse.psu.edu 124% tar xvf week01.tar
 week01/
 week01/showbytes.c
 week01/unsignedbitops.c
 week01/Makefile
 week01/memorybug.c
 week01/float.c
 week01/bitops.c
 week01/README.txt
 week01/sizeof.c
 week01/precision.c
 week01/int.c
[cse-p204inst10.cse.psu.edu 125% cd week01
```

12. Use make to compile all the files to binary executables

Use the following command to compile all the files

```
make
```

13. Navigate back to the folder 311

Use the following command to navigate to the parent folder of the current folder

```
cd ..
```

14. Use tar to create a binary tar file that includes everything in week01 folder

Use the following command to create a tarfile.

```
tar cvf week01bin.tar week01
```

```
[cse-p204inst10.cse.psu.edu 126% make
gcc -Wall -Og -g -o showbytes showbytes.c
gcc -Wall -Og -g -o unsignedbitops unsignedbitops.c
gcc -Wall -Og -g -o memorybug memorybug.c
gcc -Wall -Og -g -o bitops bitops.c
gcc -Wall -Og -g -o precision precision.c
gcc -Wall -Og -g -o float float.c
gcc -Wall -Og -g -o int int.c
gcc -Wall -Og -g -o sizeof sizeof.c
gcc -Wall -Og -g -m32 -o showbytes32 showbytes.c
gcc -Wall -Og -g -m64 -o showbytes64 showbytes.c
gcc -Wall -Og -g -m32 -o sizeof32 sizeof.c
gcc -Wall -Og -g -m64 -o sizeof64 sizeof.c
[cse-p204inst10.cse.psu.edu 127% cd ..
[cse-p204inst10.cse.psu.edu 128% tar cvf week01bin.tar week01
week01/
week01/float.c
week01/unsignedbitops
week01/precision
week01/unsignedbitops.c
week01/precision.c
week01/sizeof
week01/sizeof32
week01/bitops
week01/README.txt
week01/memorybug.c
week01/showbytes32
week01/int
week01/int.c
week01/memorybug
week01/sizeof64
week01/bitops.c
week01/showbytes.c
week01/float
week01/showbytes
week01/showbytes64
week01/sizeof.c
week01/Makefile
```

15. Checking all the files are in place

Use the following command to list all files in the directory and that week01bin.tar file contains the right files.

```
ls

tar tvf week01bin.tar
```

```
cse-p204inst10.cse.psu.edu 130% ls
week01   week01bin.tar   week01.tar
cse-p204inst10.cse.psu.edu 131% tar tvf week01bin.tar
drwx------ yuw17/fcse          0 2019-08-30 20:37 week01/
-rw------- yuw17/fcse        336 2019-08-26 09:22 week01/float.c
-rwx------ yuw17/fcse      14888 2019-08-30 20:37 week01/unsignedbitops
-rwx------ yuw17/fcse      11144 2019-08-30 20:37 week01/precision
-rw------- yuw17/fcse       1506 2019-08-28 09:44 week01/unsignedbitops.c
-rw------- yuw17/fcse        273 2019-08-28 08:44 week01/precision.c
-rwx------ yuw17/fcse      11144 2019-08-30 20:37 week01/sizeof
-rwx------ yuw17/fcse       9704 2019-08-30 20:37 week01/sizeof32
-rwx------ yuw17/fcse      14864 2019-08-30 20:37 week01/bitops
-rw------- yuw17/fcse        669 2019-08-28 10:42 week01/README.txt
-rw------- yuw17/fcse        337 2019-08-26 09:23 week01/memorybug.c
-rwx------ yuw17/fcse      10644 2019-08-30 20:37 week01/showbytes32
-rwx------ yuw17/fcse      11168 2019-08-30 20:37 week01/int
-rw------- yuw17/fcse        207 2019-08-26 09:22 week01/int.c
-rwx------ yuw17/fcse      11296 2019-08-30 20:37 week01/memorybug
-rwx------ yuw17/fcse      11144 2019-08-30 20:37 week01/sizeof64
-rw------- yuw17/fcse       1488 2019-08-28 09:44 week01/bitops.c
-rw------- yuw17/fcse        878 2019-08-28 09:57 week01/showbytes.c
-rwx------ yuw17/fcse      11224 2019-08-30 20:37 week01/float
-rwx------ yuw17/fcse      12680 2019-08-30 20:37 week01/showbytes
-rwx------ yuw17/fcse      12688 2019-08-30 20:37 week01/showbytes64
-rw------- yuw17/fcse        572 2019-08-28 09:04 week01/sizeof.c
-rw------- yuw17/fcse        440 2019-08-28 10:44 week01/Makefile
cse-p204inst10.cse.psu.edu 132% 
```

Logging out of W204, Copy files from W204 back to Local Machine

16. Logging out of W204

`exit`

17. Use scp to copy files From W204 To local machine

Make sure that you are no longer on W204 machine. You should make sure that command prompt shows you are on your local host! If you do not exit W204, this command is just copying your files on W204 from one directory to another. Use the following command to copy files from W204 machine to your local computer. Remember, scp command after you enter the password and return, there will be an implicit duo-push to your phone for you to approve before it can proceed.

`scp abc1234@cse-p204inst10.cse.psu.edu:311/week01bin.tar ~/Desktop/311/.`

```
[cse-p204inst10.cse.psu.edu 123% exit
 logout
```

```
 Connection to cse-p204inst10.cse.psu.edu closed.
[Yanlings-MacBook-Air:~ wangyl$ scp yuw17@cse-p204inst10.cse.psu.edu:311/week01bin.tar ~/Desktop/311/.
[yuw17@cse-p204inst10.cse.psu.edu's password:
 week01bin.tar                                          100%  170KB   1.5MB/s   00:00
[Yanlings-MacBook-Air:~ wangyl$ ▓
```

Find your week01bin.tar file locally and upload to Gradescope

You are done!