Exercise 37.3 Using rsync for Backup

1. Using **rsync**, we will again create a complete copy of `/usr/include` in your backup directory:

```
$ rm -rf include
$ rsync -av /usr/include .
sending incremental file list
include/
include/FlexLexer.h
include/_G_config.h
include/a.out.h
include/aio.h
.....
```

2. Let's run the command a second time and see if it does anything:

```
$ rsync -av /usr/include .
sending incremental file list

sent 127398 bytes  received 188 bytes  255172.00 bytes/sec
total size is 41239979  speedup is 323.23
```

3. One confusing thing about **rsync** is you might have expected the right command to be:

```
$ rsync -av /usr/include include
sending incremental file list
...
```

However, if you do this, you'll find it actually creates a new directory, `include/include`!

4. To get rid of the extra files you can use the `--delete` option:

```
$ rsync -av --delete /usr/include .
sending incremental file list
include/
deleting include/include/xen/privcmd.h
deleting include/include/xen/evtchn.h
....
deleting include/include/FlexLexer.h
deleting include/include/

sent 127401 bytes  received 191 bytes  85061.33 bytes/sec
total size is 41239979  speedup is 323.22
```

5. For another simple exercise, remove a subdirectory tree in your backup copy and then run **rsync** again with and without the `--dry-run` option:

```
$ rm -rf include/xen
$ rsync -av --delete --dry-run /usr/include .
sending incremental file list
include/
include/xen/
include/xen/evtchn.h
include/xen/privcmd.h

sent 127412 bytes  received 202 bytes  255228.00 bytes/sec
total size is 41239979  speedup is 323.16 (DRY RUN)
$ rsync -av --delete  /usr/include .
```

6. A simple script with a good set of options for using **rsync**:

```
#!/bin/sh
set -x

rsync --progress -avrxH -e "ssh -c blowfish" --delete $*
```

which will work on a local machine as well as over the network. Note the important `-x` option which stops **rsync** from crossing filesystem boundaries.

For more fun, if you have access to more than one computer, try doing these steps with source and destination on different machines.