

1. How many words in the word list can be made up using only the letters in your first name? (A case-insensitive search using 'homer' produces 99 matches.)

What command did you use to find that answer?

2. The `ls(1)` command includes an 's' option which causes the file size to be printed out along with whatever other information is requested. Try it out, and then give a command which will sort files in descending order by size; if two are the same size, sort them alphabetically.

3. There is no way, with just `ls(1)`, to specify permissions. Give a command which starts with 'ls -l', and prints only those files which are world writable.

4. Consider the question of a sorting the letters in a word. In order to do this, the word has to be broken into letters, the letters broken across lines, the lines sorted, and then the lines put back to spaces and the spaces removed. Complicating matters, when the newlines are taken out, the newline on the end is removed too, so some method must exist for marking the end of the line so the newline can be put back. This gives a pipeline of 8 steps and 7 pipes. Try it out until you can make it work, and then fill in the blanks (remember to build your pipeline in steps):

echo a word	_____	echo "steal"	_____
insert spaces between each letter	_____		
add a special character at the end	_____	<code>sed 's/\$/~/'</code>	_____
translate the spaces into newlines	_____		
sort the result in alphabetical order	_____		
translate the newlines back into spaces	_____		
translate the special character into a newline	_____	<code>tr '~' '\012'</code>	_____
remove all the spaces	_____		

Note: if you replace 'echo steal' with 'head /usr/local/dict/words', to alphabetize the entire word list, it won't work. Why not?

5. One way of creating a simple substitution cipher is to pick a word which has no repeated letters, and use that to initialize the substitution. Then, someone can decode your message knowing only the code word to recreate your substitution scheme. For example, if your code word is 'dumbwaiter', you use that to start, and write the rest of the alphabet in reverse order, giving this:

```
a b c d e f g h i j k l m n o p q r s t u v w x y z
d u m b w a i t e r z y x v s q p o n l k j h g f c
```

So, if I want to encode 'This is a test.', I get: 'Lten en d lwnl.' Decode the following:

```
Ea svw en owdyvf d nkqwoeso qwonsv, ltw adml en yezwyf ls ywdz skl heltskl lss xkmt dnnenldvmw.
(Rstv Dvbowh Tsyxwn)
```

6. It is possible to combine the '-s' flag and '-l' flag to `ls(1)`, thus giving output which looks like this:

```
2 -rw-r--r-- 1 kilroy user      102 Apr 19  2003 README
2 -rw-r--r-- 1 kilroy user        51 Oct 13 12:38 URL
40 -rw-r--r-- 1 kilroy user    19789 Apr 19  2003 al-Sahaf
```

The blocksize information is the new column on the left. Give a command that that starts with 'ls -ls', and sorts the files into decreasing order by size, where two files with the same size are sorted in increasing order by blocks; if two files match on both those criteria, sort by name.

7. There is no way, with just `ls(1)`, to get *only* the blocksize and filesize. Give a command using 'ls -ls', and sorts as in the item above, but prints on the block count, filesize, and name. Like this:

```
2      102  README
2       51  URL
40    19789 al-Sahaf
```

8. A telephone keypad has letters associated with each number (except 0). Sometimes one can spell words using the letters that go with a phone number. For example, if your phone number were 427-2243, you could tell people to dial 'garbage'. How many words in the word list (`/usr/local/dict/web2`) can you make using your phone number?

What command did you use to find that answer?