**Log on as linuxuser (su - linuxuser).**

Install the default word list for this lab:

|  |
| --- |
| **sudo apt install wamerican-insane** |

Let"s start by finding a file that we know is named "words" somewhere in the /usr directory:

|  |
| --- |
| **find /usr -iname “words”** |

/usr/share/dict/words

What type of file is words?

|  |
| --- |
| **file /usr/share/dict/words**  **file /etc/dictionaries-common/words**  **file /usr/share/dict/american-english-insane** |

/usr/share/dict/words: symbolic link to /etc/dictionaries-common/words

/etc/dictionaries-common/words: symbolic link to /usr/share/dict/american-english-insane

/usr/share/dict/american-english-insane: UTF-8 Unicode text

Create a symbolic link to the words file:

|  |
| --- |
| **ln -s /usr/share/dict/words ~/words** |

Get a long directory listing and you should see the following:

lrwxrwxrwx. 1 linuxuser linuxuser 21 Jan 30 12:54 words -> /usr/share/dict/words

This shows the symbolic link between ~/words and /usr/share/words.

Check the attributes of the actual file:

|  |
| --- |
| **ls -li /usr/share/dict** |

54500 -rw-r--r-- 1 root root 6830085 Oct 23 2011 american-english-insane

Create a hard link to the actual file:

|  |
| --- |
| **sudo ln /usr/share/dict/american-english-insane hard-words** |

Look at the file attributes of the hard linked file:

|  |
| --- |
| **ls -li** |

54500 -rw-r--r-- 2 root root 6830085 Oct 23 2011 hard-words

Note: Hard links point to an inode, so it is technically not a copy or pointer. Deleting the original file will not delete this file.

Check the original file:

|  |
| --- |
| **ls -l /usr/share/dict** |

54500 -rw-r--r-- 2 root root 6830085 Oct 23 2011 american-english-insane

This shows the number of hard links (notice both files show 2 since they are identical). The 54500 is the inode number of the start of the file.

**Let’s go fishing!**

Find all words that contain the string "fish”:

|  |
| --- |
| **grep "fish" ~/words** |

Wow, that’s a lot of fish. By using a pipe, let’s grab all the words that contain fish with the letter ‘t’ (case insensitive) followed by the letter ‘a’:

|  |
| --- |
| **grep “fish” ~/words | grep “[Tt]a”** |

fishtail  
fishtailed  
fishtailing  
fishtails  
standoffish  
starfish  
starfish's  
starfishes

As we can see, grep searches the entire string for occurrences of the string you are looking for. What if we wanted to search for words that contain ‘fish’ and begin with ta or Ta?

|  |
| --- |
| **grep “fish” ~/words | grep “^[Tt]a”** |

tangfish

tangfishes

tanglefish

tanglefishes

Tartuffish

tartuffish

tartuffishly

tartufish

tartufishly

tasselfish

Notice the ^ (caret) at the front of our first wildcard, that tells grep that the [Tt] must occur at the beginning of the line. By default grep searches entire strings for a match.

I want to know how many matches I have, let’s see if we can do that with the line numbering grep (the -n option)

|  |
| --- |
| **grep “fish” words | grep -n “^[Tt]a”** |

721:tangfish

722:tangfishes

723:tanglefish

724:tanglefishes

725:Tartuffish

726:tartuffish

727:tartuffishly

728:tartufish

729:tartufishly

730:tasselfish

Not quite what I was looking for, the number is the line number the word occurs on in the file. But I know a utility that may help. Let’s pipe our final output through nl:

|  |
| --- |
| **grep “fish” words | grep “^[Tt]a” | nl** |

1 tangfish

2 tangfishes

3 tanglefish

4 tanglefishes

5 Tartuffish

6 tartuffish

7 tartuffishly

8 tartufish

9 tartufishly

10 tasselfish

The nl command adds line numbers to output. You can find more information at <http://www.thegeekstuff.com/2013/02/wc-nl-examples/> (also includes good information about wc as well - a word count utility).

Redirect the output to a file using the > symbol:

|  |
| --- |
| **grep “fish” words | grep “^[Tt]a” | nl > ~/t\_fish.txt** |

NOTE: The > symbol creates or overwrites a file, the >> symbol appends to a file.

Check file for content:

|  |
| --- |
| **cat ~/t\_fish.txt** |

1 tangfish

2 tangfishes

3 tanglefish

4 tanglefishes

5 Tartuffish

6 tartuffish

7 tartuffishly

8 tartufish

9 tartufishly

10 tasselfish

And it can also used in reverse:

|  |
| --- |
| **tac ~/t\_fish.txt** |

10 tasselfish  
 9 tartufishly  
 8 tartufish  
 7 tartuffishly  
 6 tartuffish  
 5 Tartuffish  
 4 tanglefishes  
 3 tanglefish  
 2 tangfishes  
 1 tangfish

Append to the file all of the fish that start with ‘t’ or ‘T’ and have a next letter of ‘i’ using >>:

|  |
| --- |
| **grep “fish” words | grep “^[Tt]i” | nl >> ~/t\_fish.txt** |

Notice that we use > to create the initial file and then use >> to append to that file.

And let’s take a look at our results:

|  |
| --- |
| **cat ~/t\_fish.txt** |

1 tangfish

2 tangfishes

3 tanglefish

4 tanglefishes

5 Tartuffish

6 tartuffish

7 tartuffishly

8 tartufish

9 tartufishly

10 tasselfish

1 tiffish

2 tigerfish

3 tigerfishes

4 tile-fish

5 tilefish

6 tilefishes

7 titfish

Notice how we can tell (from the nl numbers) that the file was appended to.

Another grep feature $ allows us to look for patterns at the end of a line

Let’s grep all the fish words that end in ‘ly’

|  |
| --- |
| **grep “fish” words | grep “ly$” | nl** |

. 1 dwarfishly  
 2 elfishly  
 3 fishily  
 4 fishingly  
 5 huffishly  
 6 oafishly  
 7 offishly  
 8 raffishly  
 9 selfishly  
 10 serfishly  
 11 sniffishly  
 12 stand-offishly  
 13 standoffishly  
 14 tartuffishly  
 15 tartufishly  
 16 unselfishly  
 17 wolfishly

Let’s grep all the fish that end in ‘ly’ OR \| end in ‘ness’

|  |
| --- |
| **grep “fish” words | grep “ly$\|ness$” | nl** |

1 beefishness

2 dwarfishly

3 dwarfishness

4 elfishly

5 elfishness

6 fishily

7 fishiness

8 fishingly

9 huffishly

10 huffishness

11 Loafishness

12 muffishness

13 oafishly

14 oafishness

15 offishly

16 offishness

17 raffishly

18 raffishness

19 selfishly

20 selfishness

21 serfishly

22 serfishness

23 showoffishness

24 sniffishly

25 sniffishness

26 stand-offishly

27 standoffishly

28 stand-offishness

29 standoffishness

30 tartuffishly

31 tartufishly

32 unselfishly

33 unselfishness

34 wolfishly

35 wolfishness

**Grepping multiple files and directories**

Grep /scripts/work all files for “fish”:

|  |
| --- |
| **grep “fish” /scripts/work/\*** |

grep: /scripts/work/allethrin: Is a directory  
grep: /scripts/work/ancientism: Is a directory  
grep: /scripts/work/auntish: Is a directory  
/scripts/work/buffer's:fishiest  
grep: /scripts/work/congenialities: Is a directory

Ugh. Suppress (-s) those warning messages:

|  |
| --- |
| **grep -s “fish” /scripts/work/\*** |

/scripts/work/buffer's:fishiest  
/scripts/work/tytonidae:dwarfishness's

Recurse (-r) through the directories looking for

|  |
| --- |
| **grep -sr “fish” /scripts/work/\*** |

/scripts/work/allethrin/detoxing/reputability/smasheroos:standoffishnesses  
/scripts/work/allethrin/historician/Atropatene/nordmarkite:starfish's  
/scripts/work/allethrin/commercing/Preminger's/myositic:lungfish  
/scripts/work/allethrin/misdeserts/inferior's/Toda:tasselfish  
/scripts/work/ancientism/freesheet/jigglers/weatherizing:squirrelfishes  
/scripts/work/ancientism/sandboxes/fable's/rememorized:soapfish's  
/scripts/work/ancientism/Khartoum's/pulmotracheary/evangelistary:dolefish  
/scripts/work/ancientism/Baculites/metarhyolite:jackfish's  
/scripts/work/ancientism/greffe/unsolitary:squirrelfish's

… and lots more fish …

**Combining find and grep**

Find all files beginning with ‘t’ or ‘T’ that contain the word “fish”:

|  |
| --- |
| **find /scripts/work -type f -iname "t\*" -exec grep "fish" {} \;** |

dwarfishness's  
pigfish's  
teatfish  
shellfishes  
fishburger  
hammerfish  
cowfish  
hammerfish's  
tasselfish  
bonefish's

Do the same, but have grep output filenames (-H):

|  |
| --- |
| **find /scripts/work -type f -iname "t\*" -exec grep -H "fish" {} \;** |

/scripts/work/tytonidae:dwarfishness's  
/scripts/work/Gilby's/sizz/taloned/Tanaquil:pigfish's  
/scripts/work/Gilby's/sizz/uncombustible/trifolium:teatfish  
/scripts/work/Gilby's/wardrober/titanises:shellfishes  
/scripts/work/Gilby's/Harrold's/stenochlaena/teletexts:fishburger  
/scripts/work/auntish/cygnus/sandalwoods/tampered:hammerfish  
/scripts/work/auntish/cygnus/sandalwoods/tampered:cowfish  
/scripts/work/auntish/Linos/meteoropathologic/tittish:hammerfish's  
/scripts/work/allethrin/misdeserts/inferior's/Toda:tasselfish  
/scripts/work/dehorner's/Potosae's/todayll/titterings:bonefish's