Week Report 6

Wildcards

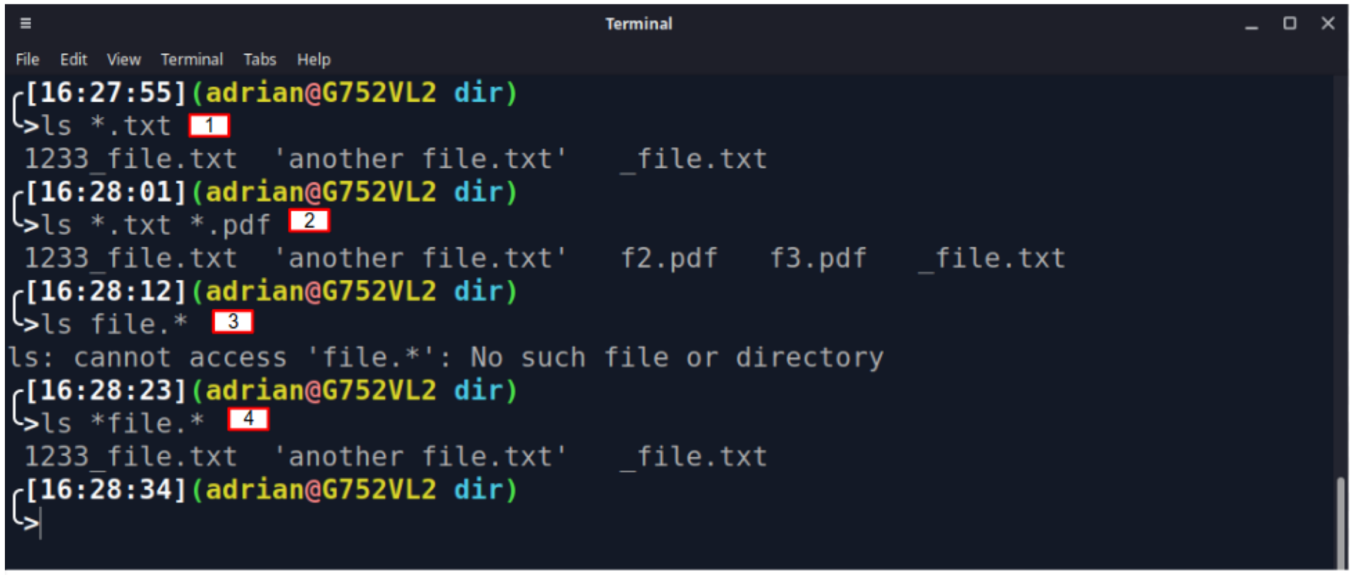
- WildCard represents letter and characters used to specify a file name for searches.
- File gobbing is the processing of pattern matching using wildcards.
- The wildcard are officially called metacharacter wildcard.

Example

- you can use a wildcard to get a long list of all files in the current directory starting with "new"
- Use wildcards to manage to directories faster
- Locate files based on a portion of their filenames
- create files and directories quicker

The * Wildcard

- The main wildcard is a star, or asterisk (*) character.
- A star alone matches anything and nothing and matches any number of characters.
- For example, `ls *.txt` will match all files that end in .txt regardless of the size of the file name.
- Examples of when to use the * wildcard:
  - When you want to list all files with a particular file extension
  - When you do not remember the complete name of a file but you remember a portion of the name.
  - When you want to copy, move, or remove all files that match a particular naming convention.



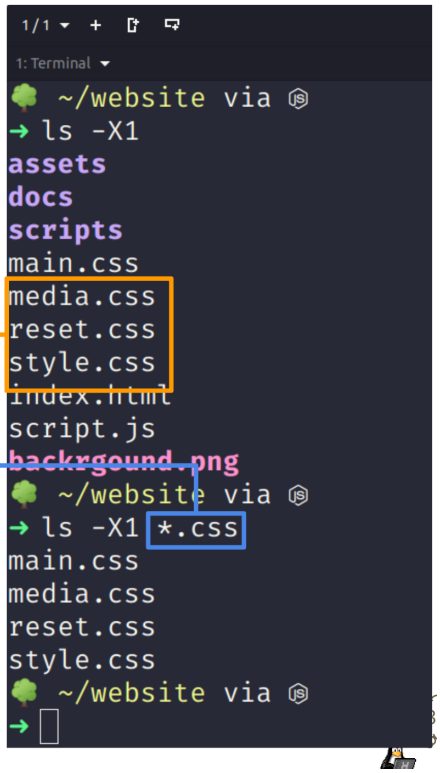
1. ls *.txt lists all the files that end in .txt
2. ls *.txt *.pdf list all the files that end in .txt and .pdf
3. ls file.* lists all the files that start with the string “file.” regardless of their file extension. In this example, there were no files in the directory that matched this criteria.
4. ls *file.* list all the files that have any letter before the string “file.” and after as well.

When working with wildcards, keep in mind two things:

- **What do the files have in common?**
  - This is the part of the file name which is the same in all the files you want to match. For example, the file extension.
- **What part of the file name is irrelevant?**
  - This is the part of the file name that it is irrelevant in the matching. In our example, this is the file name

Let's assume that you want to list only the **css** files inside this directory in a single column.
The command for achieving this would be **`ls -1 *.css`**

The *** wildcard replaces the name of the files** because we do not care about the file name in this instances. In the command **we keep the extension because that is what the files must have in common**.



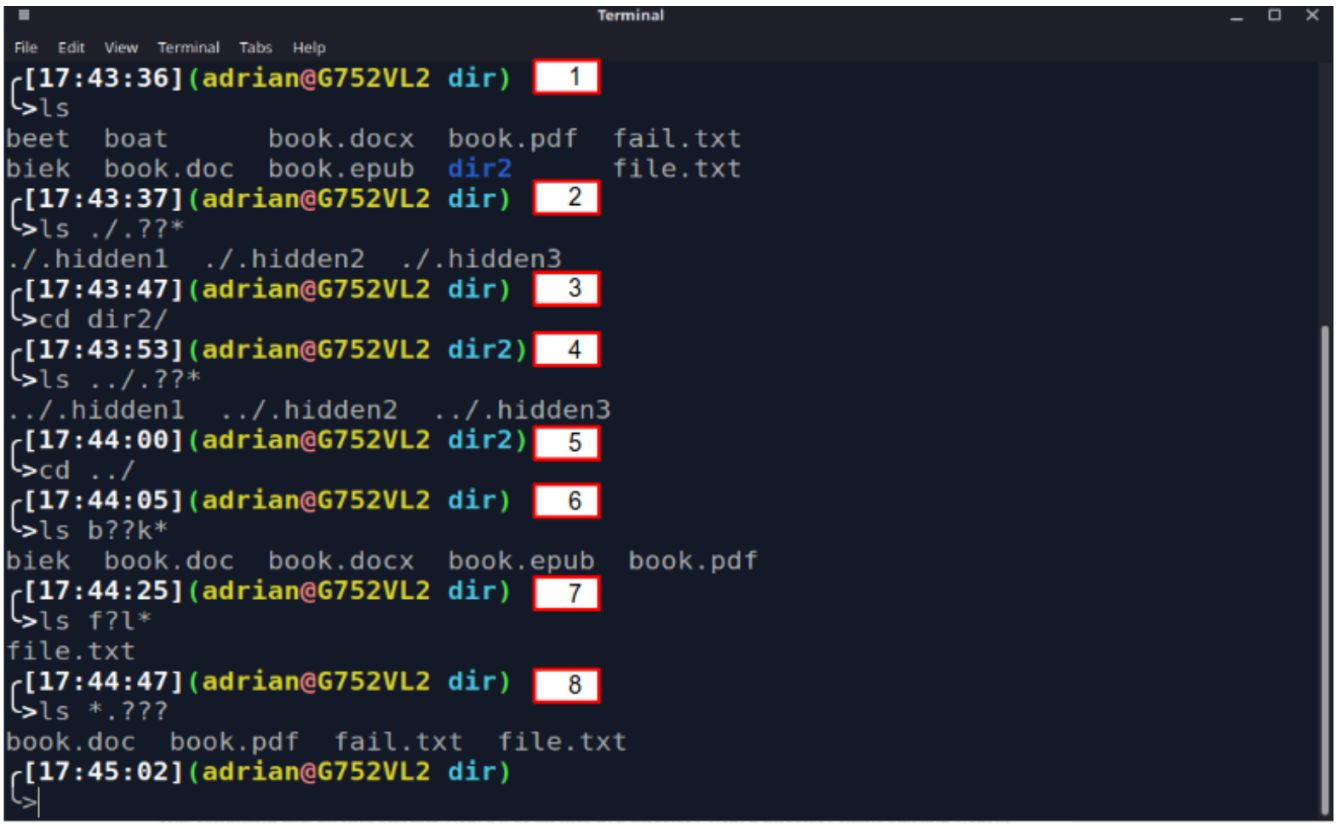
Practice 5 * Wildcard

1. Run This command from your home directory:
   `curl -s https://cis106.com/assets/wildcardpractice.sh | bash`
2. List all the files inside the **`wildcardpractice`** directory that contain the word "**`random`**" in the name.
3. List all the **`csv`** and **`txt`** files in the **`wildcardpractice`** directory.
4. List all the markdown files that start with the word "**`random`**"
5. List all the files that contain the word "**`sample`**" in the name and all the markdown files inside the **`wildcardpractice`** directory.

The ? Wildcard

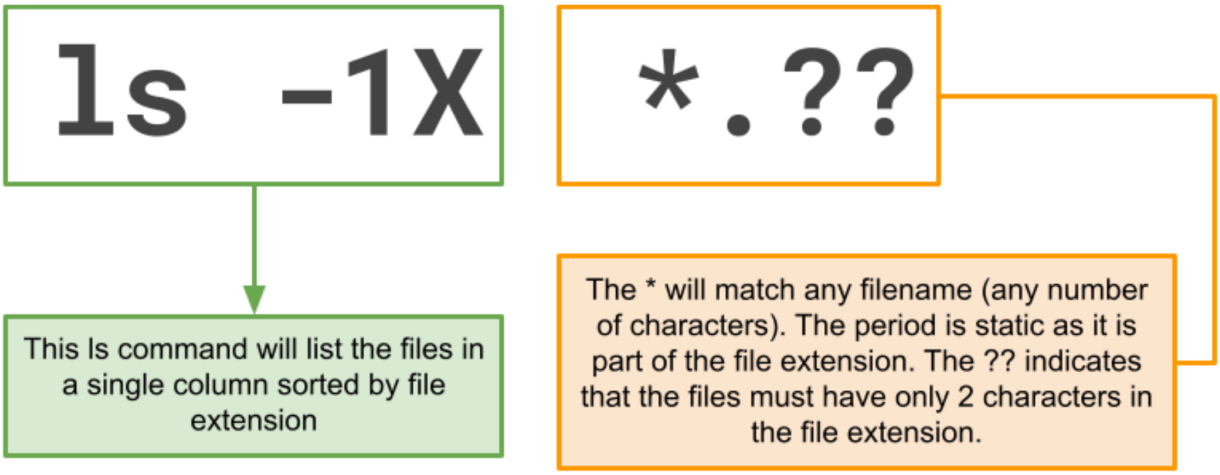
- The **? wildcard** metacharacter matches **precisely one character**.
- The **? wildcard** proves very useful when working with hidden files *(hidden files are also called **dot files***).
  - To list all hidden files use: `ls .??*` which will match all files that start with a . or .. and have any character after it.

> - Isn't this the same as using the * character on its own? **NO!**
>   - The problem with dot files and wildcard expressions is that the **current directory** and the **parent directory** have a name.
>   - The current directory is represented with a single dot (.) and the parent directory is represented with two dots (..)
>   - *Remember cd ../../../ that's what I am talking about!*
>   - If you use a wildcard expression such as `.*` to list all files that start with a dot. The shell will also match . and ..
>   - To go around this problem you can use `./.*` to match all the files in the current directory with a file name starting with a dot.
>   - You can also match all the files that start with a . in the parent directory using `../.*`



1. List all the files in the current directory (excluding hidden files)
2. List all the hidden files in the current directory
3. Changes the current working directory to dir2
4. List all the hidden files in the parent directory
5. Changes the current working directory to the previous directory (dir)
6. List all the files that have a two character between letter b and k.
7. List all the files that have a single character between letter f and l.
8. List all the files that have a 3 letter file extension.

Lets Breakdown this command



Practice 6 ? Wildcard

1. List all the files in the **`wildcardpractice`** directory that have a 3 letter file extension.
2. List all the files in the **`wildcardpractice`** directory that are hidden.
3. List all the files in the **`wildcardpractice`** directory that start with letter k and have two characters following and a 3 letter file extension.
4. List all the files in the **`wildcardpractice`** directory that start with the word sample and has single character before the file extension.
5. List all the files in the **`wildcardpractice`** directory that are hidden and have a 2 letter file extension.

Practice 6 ? Wildcard

1. List all the files in the **`wildcardpractice`** directory that have a 3 letter file extension.
2. List all the files in the **`wildcardpractice`** directory that are hidden.
3. List all the files in the **`wildcardpractice`** directory that start with letter l and have two characters following and a 3 letter file extension.
4. List all the files in the **`wildcardpractice`** directory that start with the word sample and has single character before the file extension.
5. List all the files in the **`wildcardpractice`** directory that are hidden and have a 2 letter file extension.

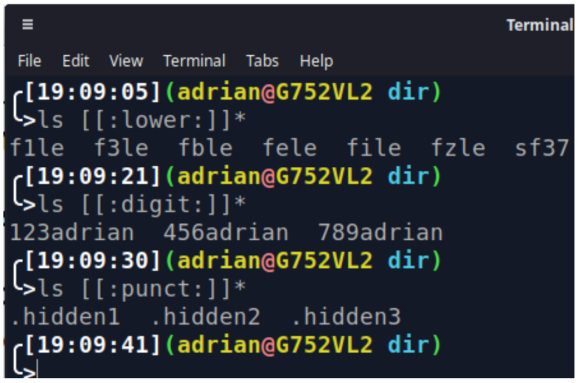
The [] wildcard

- The brackets wildcard match a single character in a range.
- The brackets wildcard use the exclamation mark to reverse the match. For example, match everything exce vowels [!aeiou] or any character except numbers [!0-9]
- **Examples:**
  - To match all files that have a vowel after letter f:
    - `ls f[aeiou]*`
  - To match all files that do not have a vowel after letter f:
    - `ls f[!aeiou]*`
  - To match all files that have a range of letters after f:
    - `ls f[a-z]*`
  - To match all files whose name has at least one number:
    - `ls *[0-9]*`
  - To match all the files whose name does not have a number in their file name:
    - `ls *[!0-9].*`
  - To match all files whose name begins with a letter from a-p or start with letters s or c:
    - `ls [a-psc]*`
  - To match all files whose name begins with any of these two sets of characters: letters from a-f or p-z:
    - `ls [a-fp-z]*`
  - To match all files whose name begins with any 3 combination of numbers and the current user's username:
    - `ls [0-9][0-9][0-9]$USER`

The [] wildcard with Regex Character Classes

You can use POSIX or Character Classes with the [] wildcard

POSIX class	Represents	Means
[:upper:]	[A-Z]	Upper case letters
[:lower:]	[a-z]	Lower case letters
[:alpha:]	[A-Za-z]	Upper and Lower case letters
[:alnum:]	[A-Za-z0-9]	Lower case, upper case, and digits
[:digit:]	[0-9]	digits
[:xdigit:]	[0-9A-Fa-f]	hexadecimal digits
[:punct:]	[.,!?:...]	puctuation
[:blank:]	[\t]	space and tabs
[:cntrl:]	n/a	control characters
[:graph:]	[^\t\n\r\g\v]	printed characters without spaces
[:print:]	[^\t\n\r\g\v]	printed characters including spaces
[:space:]	[\t\n\r\g\v]	whitespace characters



Practice 7 [] Wildcard

1. List all the files in the **`wildcardpractice`** directory that start with a lowercase letter and have a 3 letter file extension.
2. List all the files in the **`wildcardpractice`** directory that start with an uppercase character and have a number in the name.
3. List all the files in the **`wildcardpractice`** directory that start with a year in the format yyyy.
4. List all the files in the **`wildcardpractice`** directory that do not start with a vowel uppercase or lowercase
5. List all the files in the **`wildcardpractice`** directory that start with a punctuation sign.

Using Wildcards / File Globbing (quick reference)

Wildcard	Description
*	Matches zero or more characters in a filename
?	Matches any one character in a filename
[acf]	Matches one of multiple characters in a filename; in this example, a, c, or f
[a-f]	Matches one of a range of characters in a filename; in this example, any character from a through f
[!a-f]	Matches filenames that don't contain a specified range of characters; in this example, filenames that don't contain a through f

Brace expansion and how to use it

- Brace expansion {}is not a wildcard but another feature of bash that allows you to generate arbitrary strings to use with commands.
- For example,
- - to create whole directory structure in a single command: `mkdir -p music/{jazz,rock}/{p3files,videos,oggfiles}/new{1..3}`
- To create N number of files use: `touch website{1..5}.html touch file {A..Z}.txt touch file {001..10}.py touch file {a..z},{0..10}}.js`
- Remove multiple files in a single directory `rm -r {dir1,dir2,dir3,file.txt.py}`