

# Notes 7

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## Wildcard

- A **wildcard** is a symbol used to replace or represent one or more characters in a file name.
- **There are 3 wildcards:**
  - **\*** : matches zero to any number of characters
  - **?** : matches only 1 character
  - **[ ]** : matches 1 character from as given set

### The asterisk (\*) Wildcard

- The asterisk (\*) matches **zero or more characters** in a filename.
- **Examples:**
  - List all the files in a given directory
    - `ls Downloads/*`
  - List all the text files in a given directory
    - `ls Downloads/*.txt`
  - List all the text files in a given directory that start with letter f
    - `ls Downloads/w*.txt`
  - List all the files that contain the word file in the name
    - `ls *file*`
  - Move all the files one directory to another
    - `mv ~/Downloads/Nature/* ~/Pictures/wallpapers/`
  - Copy specific files based solely on their file extension
    - `cp ~/Downloads/home/*.pdf ~/Documents/*.txt ~/Projects/school/`
  - Remove specific files
    - `rm ~/Downloads, demo*.exe ~/Videos/*music*.avi`
  - Move specific files from one directory to another
    - `mv Downloads/Movies/{*.png, *.gif} Downloads/Movies/MCU`

```
1: aayushmas@Linux: ~
aayushmas@Linux:~$ ls Downloads/*
Downloads/e25671e9b097e86da20875469ece3742.jpg
Downloads/handling-text-part-1-in-class-activity-instructions.pdf
Downloads/lab5files.zip
'Downloads/Markdown Cheat sheet For CIS 106 Linux Fundamentals.png'
'Downloads/Recording 2025-11-08 at 23.08.47(1).gif'
'Downloads/Recording 2025-11-08 at 23.08.47(2).gif'
'Downloads/Recording 2025-11-08 at 23.08.47.gif'
'Downloads/Starry Night Serenity.jpeg'
Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls Downloads/*.jpg
Downloads/e25671e9b097e86da20875469ece3742.jpg  Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls Downloads/w*.jpg
Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls *file*
countries.json  document.docx  helloWorld.c  sample.xls  Ubuntu.pdf
csvfile.csv      globe.avi     Linux.pdf    Tux.png    website.html
aayushmas@Linux:~$
```

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## The ? Wildcard

- The ? wildcard meta-character matches **precisely one character**.
- The ? wildcard proves very useful when working with hidden files(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.
- **Examples:**
  - List all the hidden files in the current working directory
    - `ls ./.??*`
  - List all the hidden files in the parent directory
    - `ls ../.??*`
  - List all the files that have 2 characters in the file name between letters
- To list all hidden files use: ls.??\* which will match all files that start with a. or .. and have any character after it.
- **Examples:** m and i
  - `ls m??i*`
  - List all the files that have a single character between letters s and a
    - `ls s?a*`
  - List all the files with a 2 letter file extension
    - `ls *.??`

```
1/1 ▾ + ⌂ ↻ Tilix: aayushmas@Linux: ~ Q ⌂ - ⌂ ×
1: aayushmas@Linux: ~ ▾
./mozilla:
extensions firefox firefox-esr

./pki:
nssdb

./shutter:
drawingtool.xml profiles

./ssh:
id_ed25519 id_ed25519.pub known_hosts known_hosts.old

./vscode:
argv.json cli extensions
aayushmas@Linux:~$ ls ../*.??
ls: cannot access '../.??*': No such file or directory
aayushmas@Linux:~$ ls m??i*
jazz rock
aayushmas@Linux:~$ ls s?a*
snap:
cheat

snapshots:
new old
aayushmas@Linux:~$ ls *.??
essentials.sh marstenhouse.sh practicels.tar.xz vscode.sh
aayushmas@Linux:~$ █
```

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## The [] Wildcard

- The brackets wildcard matches a **single character in a range**.
- The brackets wildcard use the exclamation mark to reverse the match.

- For example: match everything except vowels[!aeiou] or any character

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1: aayushmas@Linux: ~
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Downloads/e25671e9b097e86da20875469ece3742.jpg
Downloads/handling-text-part-1-in-class-activity-instructions.pdf
Downloads/lab5files.zip
'Downloads/Markdown Cheat sheet For CIS 106 Linux Fundamentals.png'
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'Downloads/Recording 2025-11-08 at 23.08.47(2).gif'
'Downloads/Recording 2025-11-08 at 23.08.47.gif'
'Downloads/Starry Night Serenity.jpeg'
Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls Downloads/*.jpg
Downloads/e25671e9b097e86da20875469ece3742.jpg  Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls Downloads/w*.jpg
Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls *file*
countries.json  document.docx  helloWorld.c  sample.xls  Ubuntu.pdf
csvfile.csv      globe.avi     Linux.pdf    Tux.png    website.html
aayushmas@Linux:~$ 

```

except numbers[!0-9]

- Examples:**

- To match all files that have a vowel after letter m:
  - `ls m[aeiou]*`
- To match all files that do not have a vowel after letter m:
  - `ls m[!aeiou]*`
- To match all files that have a range of letters after l:
  - `ls l[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 letter 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`

```

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Downloads/handling-text-part-1-in-class-activity-instructions.pdf
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'Downloads/Recording 2025-11-08 at 23.08.47.gif'
'Downloads/Starry Night Serenity.jpeg'
Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls Downloads/*.*
Downloads/e25671e9b097e86da20875469ece3742.jpg  Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls Downloads/w*.jpg
Downloads/wallpaperflare.com_wallpaper.jpg
aayushmas@Linux:~$ ls *file*
countries.json  document.docx  helloWorld.c  sample.xls  Ubuntu.pdf
csvfile.csv    globe.avi     Linux.pdf    Tux.png    website.html
aayushmas@Linux:~$ 

```

## Brace Expansion

- **Brace expansion** is a feature of the bash shell that generates argument strings.
- Those strings can be used by commands to operate on files.
- They does not make calls to the operating system like wildcards do.
- They simply generate file names based on a given pattern.

## How to use Brace Expansion to create entire directory structures.

- Start with an open brace
- With no spaces, type your string separating entries by command
- Close the brace
- **Examples:**
  - Create 3 different files with the same name but different file extensions
    - `touch file.{md,txt,rtf}`
  - Create 10 files in a range from 0 to 9
    - `touch file{0..9}.txt`
  - Remove specific files that start with a given keyword
    - `rm image_*{01..08}*_camera.{png,jpg}`
  - Create an entire directory tree in a single command(1 level deep)
    - `mkdir -pv project_venus/{code,source,dataset}/new`
  - Create an entire directory tree in a single command(2 level deep)
    - `mkdir -pv project_jupiter/site/{old,new}/{code/{scripts,markup},assets/{imgs,mp3,mp4}}`