

# Notes 8

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## CAT

- **Definition:**
  - The **cat command** is used for displaying the content of a file.
  - **Cat** is short for **concatenate** which is the command's intended use.
- **Usage:**
  - **cat + option + file(s) to display**
- **Examples:**
  - Display the content of a file located in ~/Documents/sample\_files/
    - **cat ~/Documents/sample\_files/Code/helloworld.py**
  - Display the content of a file **with line numbers**
    - **cat -n ~/Documents/sample\_files/Code/helloworld.py**
  - Display the content of a file including **non printing characters and line endings**
    - **cat -A ~/Documents/sample\_files/Code/helloworld.py**

```

1: aayushmas@Linux: ~/Documents
aayushmas@Linux:~/Documents$ cd ~/Documents/
aayushmas@Linux:~/Documents$ git clone https://github.com/linuxworkshop67/sample_files
Cloning into 'sample_files'...
remote: Enumerating objects: 81, done.
remote: Counting objects: 100% (81/81), done.
remote: Compressing objects: 100% (81/81), done.
remote: Total 81 (delta 9), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (81/81), 1.96 MiB | 2.83 MiB/s, done.
Resolving deltas: 100% (9/9), done.
aayushmas@Linux:~/Documents$ cat ~/Documents/sample_files/Code/helloWorld.py
#!/usr/bin/python3

def hello():
    name=input("Enter your name: ")
    color=input("Enter fav color: ")
    print(f"Your name is {name} and your fav color is {color}")

hello()
aayushmas@Linux:~/Documents$ cat -n ~/Documents/sample_files/Code/helloWorld.py
1 #!/usr/bin/python3
2
3 def hello():
4     name=input("Enter your name: ")
5     color=input("Enter fav color: ")
6     print(f"Your name is {name} and your fav color is {color}")
7
8 hello()
aayushmas@Linux:~/Documents$ cat -A ~/Documents/sample_files/Code/helloWorld.py

#!/usr/bin/python3$
$
def hello():$#
    name=input("Enter your name: ")$#
    color=input("Enter fav color: ")$#
    print(f"Your name is {name} and your fav color is {color}")$#
$#
hello()$#
aayushmas@Linux:~/Documents$ 

```

## TAC

- **Definition:**
  - The **tac command** is used for displaying the content of a file in **reverse order**.
  - Just like cat, tac concatenates files and displays the output of the concatenation.
- **Usage:**
  - **tac + option + file(s) to display**
- **Examples:**
  - Display the content of **a file** located in ~/Documents/sample\_files/ in reverse order
    - **tac ~/Documents/sample\_files/Code/helloworld.py**
  - Display the content of **multiple files** in reverse order
    - **tac ~/Documents/sample\_files/Code/helloworld.py**
    - ~/Documents/sample\_files/Code/helloworld.sh**

```

1: aayushmas@Linux: ~/Documents ~
aayushmas@Linux:~$ cd ~/Documents/
aayushmas@Linux:~/Documents$ tac ~/Documents/sample_files/Code/helloWorld.py
hello()

    print(f"Your name is {name} and your fav color is {color}")
    color=input("Enter fav color: ")
    name=input("Enter your name: ")
def hello():
aayushmas@Linux:~/Documents$ tac ~/Documents/sample_files/Code/helloWorld.py ~/Documents/
sample_files/Code/helloWorld.sh
hello()

    print(f"Your name is {name} and your fav color is {color}")
    color=input("Enter fav color: ")
    name=input("Enter your name: ")
def hello():

#!/usr/bin/python3
hello
{
    echo "Your name is $name and your fav color is $color"
    read -p "Enter fav color: " color
    read -p "Enter your name: " name
hello(){

#!/bin/bash
aayushmas@Linux:~/Documents$ 

```

## HEAD

- **Definition:**
  - The **head command** displays the top N number of lines of a given file.
  - By default, it prints the **first 10 lines**. If more than one file name is provided then data from each is preceded by its file name.
- **Usage:**
  - **head + option + file(s)**
- **Examples:**
  - Display the **first 10 lines** of a file
    - **head ~/Documents/sample\_files/Txt/dracula.txt**
  - Display the **first 5 lines of a file**
    - **head -5 ~/Documents/sample\_files/Txt/dracula.txt**
  - Display the **first 5 lines of multiple files**
    - **head -n 5 ~/Documents/sample\_files/Txt/{dracula,war-and-peace}.txt**
  - Display the **first line of multiple files** using wildcards
    - **head -n 1 Csv/\*.csv Code/\*.py**
  - Display a **given number of lines** of the output of a given command
    - **ls -l ~/cis106/ |head -n 2**
  - Display the **name of the file** in the output

- `head -v -n 7 Json/joke.json`
- Display a **given number of bytes** instead of lines
  - `head -c 50 Txt/dracula.txt`

```

1:aayushmas@Linux:~/Documents/sample_files ~
2:aayushmas@Linux:~/Documents/sample_files ~
aayushmas@Linux:~$ head ~/Documents/Book/dracula.txt
head: cannot open '/home/aayushmas/Documents/Book/dracula.txt' for reading: No such file
or directory
aayushmas@Linux:~$ head ~/Documents/sample_files/Txt/dracula.txt
The Project Gutenberg eBook of Dracula, by Bram Stoker

This eBook is for the use of anyone anywhere in the United States and
most other parts of the world at no cost and with almost no restrictions
whatsoever. You may copy it, give it away or re-use it under the terms
of the Project Gutenberg License included with this eBook or online at
www.gutenberg.org. If you are not located in the United States, you
will have to check the laws of the country where you are located before
using this eBook.

aayushmas@Linux:~$ head -5 ~/Documents/sample_files/Txt/dracula.txt
The Project Gutenberg eBook of Dracula, by Bram Stoker

This eBook is for the use of anyone anywhere in the United States and
most other parts of the world at no cost and with almost no restrictions
whatsoever. You may copy it, give it away or re-use it under the terms
aayushmas@Linux:~$ head -n 5 ~/Documents/sample_files/Txt/{dracula,war-and-peace}.txt
The eBook is for the use of anyone anywhere in the United States and
most other parts of the world at no cost and with almost no restrictions
whatsoever. You may copy it, give it away or re-use it under the terms
aayushmas@Linux:~$ head -n 5 ~/Documents/sample_files/Txt/war-and-peace.txt
The Project Gutenberg eBook of War and Peace, by Leo Tolstoy

This eBook is for the use of anyone anywhere in the United States and
most other parts of the world at no cost and with almost no restrictions
whatsoever. You may copy it, give it away or re-use it under the terms
aayushmas@Linux:~$ cd ~/Documents/sample_files/
aayushmas@Linux:~/Documents/sample_files$ head -c 50 Txt/dracula.txt
The Project Gutenberg eBook of Dracula, by Bram
aayushmas@Linux:~/Documents/sample_files$ 

2:aayushmas@Linux:~/Documents/sample_files ~
aayushmas@Linux:~$ ls -l ~/cis106/ |head -n 2
total 24
drwxrwxr-x  2 aayushmas aayushmas 4096 Sep 19 10:41 cheats
aayushmas@Linux:~$ ls -l ~/cis106/ | head -n 4
total 24
drwxrwxr-x  2 aayushmas aayushmas 4096 Sep 19 10:41 cheats
drwxrwxr-x  5 aayushmas aayushmas 4096 Dec  3 14:37 ExtraCredit
drwxrwxr-x  4 aayushmas aayushmas 4096 Oct 10 23:04 final_project
aayushmas@Linux:~$ cd ~/Documents/sample_files/
aayushmas@Linux:~/Documents/sample_files$ head -n 1 Csv/*.csv Code/*.py
==> Csv/cars.csv <==
Car;MPG;Cylinders;Displacement;Horsepower;Weight;Acceleration;Model;Origin
==> Csv/cereal.csv <==
name;nbr;type;calories;protein;fat;sodium;fiber;carbo;sugars;potass;vitamins;shelf;weig
ht;cups;rating
==> Csv/contacts.csv <==
first_name,last_name,company_name,address,city,county,state,zip,phone1,phone,email
==> Csv/country.csv <==
Name,Code
==> Csv/fake_users.csv <==
ip_address,username,email,password,domain,department
==> Csv/users_and_ips.csv <==
192.168.12.45:shadow_walker92
==> Code/helloWorld.py <==
#!/usr/bin/python3
aayushmas@Linux:~/Documents/sample_files$ head -v -n 7 Json/joke.json
==> Json/joke.json <==
{
    "error": false,
    "category": "Programming",
    "type": "single",
    "joke": "Eight bytes walk into a bar.\n\tThe bartender asks, \"Can I get you anything?\"\n\t\"Yeah,\" reply the bytes.\n\t\"Make us a double.\"", 
    "flags": {
        "nsfw": false,
aayushmas@Linux:~/Documents/sample_files$ 

```

## TAIL

- **Definition:**
  - The **tail command** displays the last N number of lines of a given file.
  - By default, it prints the **last 10 lines**. If more than one file name is provided then data from each file is preceded by its file name.
- **Usage:**
  - `tail + option + file(s)`
- **Examples:**
  - Display the **last 10 lines** of a file
    - `tail ~/Documents/sample_files/Txt/dracula.txt`
  - Display the **last 5 lines** of a file
    - `tail -5 ~/Documents/sample_files/Txt/dracula.txt`
  - Display the **last 5 lines** of multiple files
    - `tail -n 5 Txt/{dracula,war-and-peace}.txt`
  - Display the **last line** of multiple files using wildcards
    - `tail -n 1 Csv/*.csv Code/*.py`
  - Display a **given number of lines** of the output of a given command
    - `ls -l ~/cis106/ |tail -n 2`
  - Display the **name of the file** in the output
    - `tail -v -n 7 Json/joke.json`
  - Display a **given number of bytes** instead of lines
    - `tail -c 50 Txt/dracula.txt`

The screenshot shows two terminal windows side-by-side. Both windows have the title 'Tilix: aayushmas@Linux: ~/Documents/sample\_files'. The left window (session 1) shows the output of 'tail ~/Documents/sample\_files/Txt/dracula.txt'. It contains text about the Project Gutenberg website and its search facility. The right window (session 2) shows the output of 'tail -n 1 Csv/\*.csv' followed by several CSV file outputs. These CSV files include 'cars.csv', 'cereal.csv', 'contacts.csv', 'country.csv', 'fake\_users.csv', 'users\_and\_ips.csv', and 'helloWorld.py'. The CSV files show data like car models and their prices, and the Python file shows a simple hello world function.

```

1:aayushmas@Linux:~/Documents/sample_files ~
aayushmas@Linux:~$ tail ~/Documents/sample_files/Txt/dracula.txt
Most people start at our website which has the main PG search
facility: www.gutenberg.org.

This website includes information about Project Gutenberg™,
including how to make donations to the Project Gutenberg Literary
Archive Foundation, how to help produce our new eBooks, and how to
subscribe to our email newsletter to hear about new eBooks.

aayushmas@Linux:~$ tail -5 ~/Documents/sample_files/Txt/dracula.txt
including how to make donations to the Project Gutenberg Literary
Archive Foundation, how to help produce our new eBooks, and how to
subscribe to our email newsletter to hear about new eBooks.

aayushmas@Linux:~$ cd ~/Documents/sample_files/
aayushmas@Linux:~/Documents/sample_files$ tail -n 5 Txt/{dracula,war-and-
-peace}.txt
==> Txt/dracula.txt <=
including how to make donations to the Project Gutenberg Literary
Archive Foundation, how to help produce our new eBooks, and how to
subscribe to our email newsletter to hear about new eBooks.

==> Txt/war-and-peace.txt <=
including how to make donations to the Project Gutenberg Literary
Archive Foundation, how to help produce our new eBooks, and how to
subscribe to our email newsletter to hear about new eBooks.

aayushmas@Linux:~/Documents/sample_files$ ls -l ~/cis106/ |tail -n 2
drwxrwxr-x 10 aayushmas aayushmas 4096 Dec  3 14:37 notes
drwxrwxr-x 10 aayushmas aayushmas 4096 Dec  3 14:37 week_reports
aayushmas@Linux:~/Documents/sample_files$ 
```

## CUT

- **Definition:**
  - The **cut command** is used to extract a specific section of each line of a file and display it to the screen.
- **Usage:**
  - **cut + option + file(s)**
- **Examples:**
  - **Display a list of all the users in your system**
    - **cut -d ':' -f1 /etc/passwd**
  - **Display a list of all the users in your system with their login shell**
    - **cut -d ':' -f1,7 /etc/passwd**
  - **Cut a range of bytes per line**
    - **cut -b 1-5 practice.txt**
  - **Cut a file using a delimiter but changing the delimiter in the output.**
    - **cut -d ':' -f1,7 --output-delimiter=' ' /etc/passwd**
  - **Cut a file excluding a given field**
    - **cut -d ':' --complement -s -f6 /etc/passwd**
  - **Cut the permissions from the output of ls**
    - **ls -l | cut -d ' ' --complement -s -f1**

```

1:aayushmas@Linux:~$ cut -d ':' -f1 /etc/passwd
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
_apt
nobody
systemd-network
dhcpcd

2:aayushmas@Linux:~$ cut -d ':' -f1,7 /etc/passwd
root:/bin/bash
daemon:/usr/sbin/nologin
bin:/usr/sbin/nologin
sys:/usr/sbin/nologin
sync:/bin/sync
games:/usr/sbin/nologin
man:/usr/sbin/nologin
lp:/usr/sbin/nologin
mail:/usr/sbin/nologin
news:/usr/sbin/nologin
uucp:/usr/sbin/nologin
proxy:/usr/sbin/nologin
www-data:/usr/sbin/nologin
backup:/usr/sbin/nologin
list:/usr/sbin/nologin
irc:/usr/sbin/nologin
_apt:/usr/sbin/nologin
nobody:/usr/sbin/nologin
systemd-network:/usr/sbin/nologin
dhcpcd:/bin/false

3:aayushmas@Linux:~/Documents/sample_files/Txt$ touch practice.txt
aayushmas@Linux:~/Documents/sample_files/Txt$ cut -b 1-5 practice.txt
*** E

Updat
be re

Creat
law m
so th
Unite
royal
of th
Guten
conce
and m
the t
of th
copie

4:aayushmas@Linux:~$ cut -d ':' -f1,7 --output-delimiter=' ' /etc/passwd
root → /bin/bash
daemon → /usr/sbin/nologin
bin → /usr/sbin/nologin
sys → /usr/sbin/nologin
sync → /bin/sync
games → /usr/sbin/nologin
man → /usr/sbin/nologin
lp → /usr/sbin/nologin
mail → /usr/sbin/nologin
news → /usr/sbin/nologin
uucp → /usr/sbin/nologin
proxy → /usr/sbin/nologin
www-data → /usr/sbin/nologin
backup → /usr/sbin/nologin
list → /usr/sbin/nologin
irc → /usr/sbin/nologin
_apt → /usr/sbin/nologin
nobody → /usr/sbin/nologin

5:aayushmas@Linux:~$ ls -l | cut -d ' ' --complement -s -f1
2324
1 aayushmas aayushmas 4081 Dec 5 05:48 access.log
9 aayushmas aayushmas 4096 Oct 28 23:41 cis106
3 aayushmas aayushmas 4096 Oct 30 18:03 colors
2 aayushmas aayushmas 4096 Sep 18 15:30 Desktop
4 aayushmas aayushmas 4096 Dec 5 09:23 Documents
3 aayushmas aayushmas 4096 Nov 9 15:35 Downloads
1 aayushmas aayushmas 7747 Sep 10 10:41 essentials.sh
6 aayushmas aayushmas 4096 Nov 13 18:55 inClassActivity
2 aayushmas aayushmas 4096 Feb 22 2022 lab5files
5 aayushmas aayushmas 4096 Nov 8 21:52 lab6-challenge1
3 aayushmas aayushmas 4096 Nov 8 23:03 lab6-challenge2
3 aayushmas aayushmas 4096 Nov 2 17:27 marstenHouse
1 aayushmas aayushmas 3407 Oct 29 14:47 marstenhouse.sh
2 aayushmas aayushmas 4096 Sep 18 15:30 Music
2 aayushmas aayushmas 4096 Nov 13 18:57 Pictures
2 aayushmas aayushmas 4096 Nov 13 17:21 practice1
1 aayushmas aayushmas 2229212 Oct 29 14:47 practice1.tar.xz
2 aayushmas aayushmas 4096 Sep 18 15:30 Public
2 aayushmas aayushmas 4096 Nov 1 20:27 Scripts

6:aayushmas@Linux:~$ head -n 5 /etc/passwd
root:x:0:root:/root:/bin/bash
daemon:x:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:bin:/bin:/usr/sbin/nologin
sys:x:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
aayushmas@Linux:~$ cut -d ':' --complement -s -f6 /etc/
passwd
root:x:0:root:/bin/bash
daemon:x:1:daemon:/usr/sbin/nologin
bin:x:2:bin:/usr/sbin/nologin
sys:x:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/sbin/nologin
man:x:6:12:man:/usr/sbin/nologin
lp:x:7:lp:/usr/sbin/nologin
mail:x:8:mail:/usr/sbin/nologin
news:x:9:9:news:/usr/sbin/nologin
uucp:x:10:10:uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/usr/sbin/nologin
www-data:x:33:33:www-data:/usr/sbin/nologin

```

- Note:**

- **-d ' '** : Delimiter is the character that separates the field.(here by space)
- **-d ";"** : Separate fields by ;
- **-f3,4** : Field select the 3rd and 4th fields
- **--output-delimiter=' ⇒ '** : Replace the default space between the two fields with ⇒. (**no space after =**)
- **--complement** : Removes the fields listed and keep the rest
- **-s** : Suppress lines that don't contain the delimiter.
- **ls -l** : Produces long listing output.
- **|** : Pipe sends the output of the command on the left into the command on the right.(here output from ls is send to cut)

## PASTE

- Definition:**

- The **paste command** is used for joining files horizontally in columns

- Usage:**

- **paste + option + files**

- Examples:**

- **Merge two files**
  - **paste users.lst codes.lst**
- **Merge two files using a different delimiter**
  - **paste -d ":" users.lst codes.lst**

```

1:aayushmas@Linux:~/Documents/sample_files/Lst$ cd ~/Documents/sample_files/Lst/
aayushmas@Linux:~/Documents/sample_files/Lst$ paste users.lst codes.lst
shadow_walker92 48291
LunaByte 17
crystal_forge 905004
xXStormRiderXx 382
betaWolf 7461
evergreen_7 22009
neonPixel 58
rustedAnchor 7700031
orbit_hopper 441
CobaltKnight 992
echo_sentry 30567
midnightMarauder 8
ZephyrWing 731
quantumQuill 540020
ashen_root 1299

aayushmas@Linux:~/Documents/sample_files/Lst$ paste -d "_" users.lst codes.lst
shadow_walker92_48291
LunaByte_17
crystal_forge_905004
xXStormRiderXx_382
betaWolf_7461
evergreen_7_22009
neonPixel_58
rustedAnchor_7700031
orbit_hopper_441
CobaltKnight_992
echo_sentry_30567
midnightMarauder_8
ZephyrWing_731
quantumQuill_540020
ashen_root_1299
:

```

## SORT

- **Definition:**

- The **sort command** is used for sorting files. It supports sorting: alphabetically, in reverse order, by number, and by month.
- The **sort command** follows this order unless specified otherwise:
  - Lines starting with a **number will appear before** lines starting with **letter**.
  - Lines starting with a **letter that appears earlier in the alphabet will appear before** lines starting with a **letter that appears later in the alphabet**.
  - Lines starting with a **lowercase letter will appear before** lines starting with the **same letter in uppercase**.

- **Usage:**

- **sort + option + file**

- **Examples:**

- Sort a file
  - **sort users.lst**
- Sort a file and **save the output** to a new file
  - **sort -o sorted.lst users.lst**
  - **sort -o output\_file input\_file**
- Sort a file in **reverse order**
  - **sort -r users.lst**
- Sort by **column number**
  - **sort -k 2 users.lst**
- Sort a file with **numeric data**
  - **sort -n codes.lst**
- **Check** if a file is sorted
  - **sort -c sorted.lst**
- **Sort** and **remove** duplicate entries
  - **sort -u users.lst**

The screenshot shows three terminal windows side-by-side against a dark background featuring a planet and trees.

- Terminal 1:** Shows the command `sort -r users.lst` being run, resulting in a reversed list of names.
- Terminal 2:** Shows the command `sort -k 2 users.lst` being run, resulting in a list where the second column (last name) is sorted alphabetically.
- Terminal 3:** Shows the command `sort -n codes.lst` being run, resulting in a numerical list starting from 8 and ending at 7700031.

## WC

- **Definition:**
  - The **wc command** is used for printing the number of lines, characters and bytes in a file
- **Usage:**
  - **wc + option + file(s)**
- **Examples:**
  - Display the **number of characters** in a file
    - `wc -m dracula.txt`
  - Display the **number of lines** in a file
    - `wc -l dracula.txt`
  - Display the **number of words** in a file
    - `wc -w dracula.txt`

```
1: aayushmas@Linux: ~/Documents/sample_files/Txt 
aayushmas@Linux:~/Documents/sample_files/Txt$ cd ~/Documents/sample_files/Txt/
aayushmas@Linux:~/Documents/sample_files/Txt$ wc -m users.txt
wc: users.txt: No such file or directory
aayushmas@Linux:~/Documents/sample_files/Txt$ wc -m dracula.txt
880834 dracula.txt
aayushmas@Linux:~/Documents/sample_files/Txt$ wc -l dracula.txt
15845 dracula.txt
aayushmas@Linux:~/Documents/sample_files/Txt$ wc -w dracula.txt
164354 dracula.txt
aayushmas@Linux:~/Documents/sample_files/Txt$ █
```