Question 1: cat, tac, head, tail

```
don@dono:~$ cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
```

```
don@dono:~$ tac /etc/passwd
yaws:x:129:139::/var/cache/yaws:/usr/sbin/nologin
epmd:x:128:138::/var/run/epmd:/usr/sbin/nologin
_flatpak:x:127:137:Flatpak system-wide installation helper,,,:/nonexistent:/usr/sbin/nologin
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
don:x:1000:1000:Don Mo,,,:/home/don:/bin/bash
```

```
don@dono:~$ cat -ne /etc/passwd
     1  root:x:0:0:root:/root:/bin/bash$
     2  daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin$
     3  bin:x:2:2:bin:/bin:/usr/sbin/nologin$
     4  sys:x:3:3:sys:/dev:/usr/sbin/nologin$
     5  sync:x:4:65534:sync:/bin:/bin/sync$
     6  games:x:5:60:games:/usr/games:/usr/sbin/nologin$
```

```
don@dono:~$ head -5 /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
don@dono:~$ tail -5 /etc/passwd
don:x:1000:1000:Don Mo,,,:/home/don:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
_flatpak:x:127:137:Flatpak system-wide installation helper,,,:/nonexistent:/usr/sbin/nologin
epmd:x:128:138::/var/run/epmd:/usr/sbin/nologin
yaws:x:129:139::/var/cache/yaws:/usr/sbin/nologin
don@dono:~$ _
```

Question 2: cut

```
don@dono:~$ cut -d ":" -f1 /etc/passwd
root
daemon
bin
sys
sync
```

```
don@dono:~$ 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
```

```
don@dono:~$ 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
```

```
don@dono:~$ cut -d ',' --complement  -s -f3 /etc/passwd
systemd-network:x:100:102:systemd Network Management,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,:/run/systemd:/usr/sbin/nologin
tss:x:106:111:TPM software stack,,:/var/lib/tpm:/bin/false
avahi-autoipd:x:109:116:Avahi autoip daemon,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:110:46:usbmux daemon,,:/var/lib/usbmux:/usr/sbin/nologin
rtkit:x:111:117:RealtimeKit,,:/proc:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:113:120:user for cups-pk-helper service,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:114:29:Speech Dispatcher,,:/run/speech-dispatcher:/bin/false
avahi:x:115:121:Avahi mDNS daemon,,:/var/run/avahi-daemon:/usr/sbin/nologin
kernoops:x:116:65534:Kernel Oops Tracking Daemon,,:/:/usr/sbin/nologin
nm-openvpn:x:118:124:NetworkManager OpenVPN,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
hplip:x:119:7:HPLIP system user,,:/run/hplip:/bin/false
colord:x:121:126:colord colour management daemon,,:/var/lib/colord:/usr/sbin/nologin
pulse:x:123:128:PulseAudio daemon,,:/var/run/pulse:/usr/sbin/nologin
sssd:x:126:131:SSSD system user,,:/var/lib/sss:/usr/sbin/nologin
don:x:1000:1000:Don Mo,,:/home/don:/bin/bash
_flatpak:x:127:137:Flatpak system-wide installation helper,,:/nonexistent:/usr/sbin/nologin
```

Question 3 Paste, wc

```
don@dono:~$ curl -s https://cis106.com/assets/shopping.md -o shoping.md
don@dono:~$ curl -s https://cis106.com/assets/tasks.md -o tasks.md
don@dono:~$ ls
 1.txt              Downlaods           lab5-imgs           shoping.md
 audioacc           file                lab5-video          snap
 audiomp3           file.txt            lab6                tasks.md
 Backup             jam                 lab6-q5             Templates
 challenge-Lab6     lab4files           Pictures            Videos
 cis106-spring22    lab-5               practicels          'VirtualBox VMs'
 Desktop            lab5-audio          practicels.tar.xz
 Documents          lab5ChallengeQuestion   Public
 dog.theme          lab5-docs           Share
don@dono:~$ past shoping.md  tasks.md

Command 'past' not found, did you mean:

  command 'fast' from snap fast (0.0.4)
  command 'psst' from snap psst (0.1-8)
  command 'paste' from deb coreutils (8.30-3ubuntu2)
  command 'phast' from deb phast (1.5+dfsg-1)
  command 'plast' from deb plast (2.3.2+dfsg-1build1)
  command 'ast' from deb jruby (9.1.17.0-3build6)
  command 'last' from deb util-linux (2.34-0.1ubuntu9.3)
  command 'nast' from deb nast (0.2.0-7build1)
  command 'psst' from deb psst (0.1-11)
  command 'pat' from deb dist (1:3.5-236-0.1build1)
  command 'pass' from deb pass (1.7.3-2)

See 'snap info <snapname>' for additional versions.

don@dono:~$ paste shoping.md tasks.md
## Shopping       ## Tasks
1. Apples:        1. Do Laundry:
2. Meat:          2. Cook lunch:
3. Bread:         3. Clean room:
don@dono:~$ _
```

```
don@dono:~$ wc Documents/Books/dracula.txt
 15860 164386 881251 Documents/Books/dracula.txt
don@dono:~$ wc -l Documents/Books/dracula.txt
15860 Documents/Books/dracula.txt
don@dono:~$ wc -w Documents/Books/pride-and-prejudice.txt
124749 Documents/Books/pride-and-prejudice.txt
don@dono:~$ _
```

```
don@dono:~$ sort /etc/passwd
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
avahi-autoipd:x:109:116:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologi
n
avahi:x:115:121:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
cups-pk-helper:x:113:120:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/
```

Question 4 tr, grep

```
don@dono:~$ ls Documents/Csv/
cars.csv  cereal.csv  contacts.csv  country.csv  film.csv
don@dono:~$ cat Documents/Csv/cereal.csv | tr ';' ','
name,mfr,type,calories,protein,fat,sodium,fiber,carbo,sugars,potass,vitamins,shelf,wei
ght,cups,rating
String,Categorical,Categorical,Int,Int,Int,Int,Float,Float,Int,Int,Int,Int,Float,Float
,Float
100% Bran,N,C,70,4,1,130,10,5,6,280,25,3,1,0.33,68.402973
100% Natural Bran,Q,C,120,3,5,15,2,8,8,135,0,3,1,1,33.983679
All-Bran,K,C,70,4,1,260,9,7,5,320,25,3,1,0.33,59.425505
```

```
      Darcy, as well as Elizabeth, really loved them; and they were
don@dono:~/Documents/Books$ grep -i "love" pride-and-prejudice.txt
      that he _may_ fall in love with one of them, and therefore you
      persuade you at last. I was sure you loved your girls too well to
      anything. Lydia, my love, though you _are_ the youngest, I dare
      be fond of dancing was a certain step towards falling in love;
      first, and was in a way to be very much in love; but she
      who have heart enough to be really in love without encouragement.
      secure of him, there will be leisure for falling in love as
```

```
don@dono:~/Documents/Books$ grep -Ew "love|hate" pride-and-prejudice.txt
      that he _may_ fall in love with one of them, and therefore you
      anything. Lydia, my love, though you _are_ the youngest, I dare
      be fond of dancing was a certain step towards falling in love;
      "Come, Darcy," said he, "I must have you dance. I hate to see you
      first, and was in a way to be very much in love; but she
      who have heart enough to be really in love without encouragement.
      secure of him, there will be leisure for falling in love as
      love, from love to matrimony, in a moment. I knew you would be
      Well, Jane, make haste and tell us; make haste, my love."
      a gentleman at my brother Gardiner's in town so much in love with her,
      love!"
      "I have been used to consider poetry as the _food_ of love," said
      "Of a fine, stout, healthy love it may. Everything nourishes what
      dearly love a laugh."
      "And _your_ defect is to hate everybody."
      bit of fish to be got to-day. Lydia, my love, ring the bell—I
      I hate such false friends. Why could he not keep on quarreling
      To find a man agreeable whom one is determined to hate! Do not
```

```
don@dono:~/Documents/Books$ grep -o 'love' dracula.txt
love
love
love
love
love
love
```

Question 5 awk and sed

```
don@dono:~/Documents/Csv$ awk -F ";" '{print $1,$NF}' cars.csv
Car Origin
STRING CAT
Chevrolet Chevelle Malibu US
Buick Skylark 320 US
Plymouth Satellite US
AMC Rebel SST US
Ford Torino US
Ford Galaxie 500 US
Chevrolet Impala US
Plymouth Fury iii US
Pontiac Catalina US
AMC Ambassador DPL US
```

```
don@dono:~/Documents/Csv$ awk -F ";" '{OFS=" is made on "}{print $1,$NF}
' cars.csv
Car is made on Origin
STRING is made on CAT
Chevrolet Chevelle Malibu is made on US
Buick Skylark 320 is made on US
Plymouth Satellite is made on US
AMC Rebel SST is made on US
Ford Torino is made on US
Ford Galaxie 500 is made on US
Chevrolet Impala is made on US
Plymouth Fury iii is made on US
Pontiac Catalina is made on US
AMC Ambassador DPL is made on US
```

```
don@dono:~/Documents/Csv$ awk 'NR > 3 { print }' cars.csv
Buick Skylark 320;15.0;8;350.0;165.0;3693.;11.5;70;US
Plymouth Satellite;18.0;8;318.0;150.0;3436.;11.0;70;US
AMC Rebel SST;16.0;8;304.0;150.0;3433.;12.0;70;US
Ford Torino;17.0;8;302.0;140.0;3449.;10.5;70;US
Ford Galaxie 500;15.0;8;429.0;198.0;4341.;10.0;70;US
Chevrolet Impala;14.0;8;454.0;220.0;4354.;9.0;70;US
Plymouth Fury iii;14.0;8;440.0;215.0;4312.;8.5;70;US
Pontiac Catalina;14.0;8;455.0;225.0;4425.;10.0;70;US
AMC Ambassador DPL;15.0;8;390.0;190.0;3850.;8.5;70;US
```

```
don@dono:~/Documents/Csv$ awk -F: '{print toupper($0)}' cars.csv
CAR;MPG;CYLINDERS;DISPLACEMENT;HORSEPOWER;WEIGHT;ACCELERATION;MODEL;ORIG
IN
STRING;DOUBLE;INT;DOUBLE;DOUBLE;DOUBLE;DOUBLE;INT;CAT
CHEVROLET CHEVELLE MALIBU;18.0;8;307.0;130.0;3504.;12.0;70;US
BUICK SKYLARK 320;15.0;8;350.0;165.0;3693.;11.5;70;US
PLYMOUTH SATELLITE;18.0;8;318.0;150.0;3436.;11.0;70;US
AMC REBEL SST;16.0;8;304.0;150.0;3433.;12.0;70;US
FORD TORINO;17.0;8;302.0;140.0;3449.;10.5;70;US
FORD GALAXIE 500;15.0;8;429.0;198.0;4341.;10.0;70;US
CHEVROLET IMPALA;14.0;8;454.0;220.0;4354.;9.0;70;US
```

```
don@dono:~/Documents/Books$ sed 's/Dracula/Alucard/' dracula.txt | grep
"Alucard"
The Project Gutenberg eBook of Alucard, by Bram Stoker
Title: Alucard
Castle Alucard, as there are no maps of this country as yet to compare
town named by Count Alucard, is a fairly well-known place. I shall enter
Count Alucard had directed me to go to the Golden Krone Hotel, which I
was all he knew. When I asked him if he knew Count Alucard, and could
```

```
don@dono:~$ sed G /etc/passwd
root:x:0:0:root:/root:/bin/bash

daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin

bin:x:2:2:bin:/bin:/usr/sbin/nologin

sys:x:3:3:sys:/dev:/usr/sbin/nologin

sync:x:4:65534:sync:/bin:/bin/sync

games:x:5:60:games:/usr/games:/usr/sbin/nologin

man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
```

Question 6 I/O Redirection

```
don@dono:~/Documents/Books$ grep -n /b
bin/   boot/
don@dono:~/Documents/Books$ grep -n "/bin/bash" /etc/passwd
1:root:x:0:0:root:/root:/bin/bash
46:don:x:1000:1000:Don Mo,,,:/home/don:/bin/bash
don@dono:~/Documents/Books$ grep -n "/bin/bash" /etc/passwd | ec -l
ec: command not found
don@dono:~/Documents/Books$ grep -n "/bin/bash" /etc/passwd | wc -l
2
don@dono:~/Documents/Books$ _
```

```
don@dono:~$ grep -n "/sbin/nologin" /etc/passwd | wc -l
41
don@dono:~$ _
```

```
don@dono:~/Documents/Csv$ wc -l cars.csv | grep -wc 'Ford' cars.csv
53
don@dono:~/Documents/Csv$ _
```

```
don@dono:~/Documents/Csv$ head cereal.csv
name;mfr;type;calories;protein;fat;sodium;fiber;carbo;sugars;potass;vita
mins;shelf;weight;cups;rating
String;Categorical;Categorical;Int;Int;Int;Int;Float;Float;Int;Int;Int;I
nt;Float;Float;Float
100% Bran;N;C;70;4;1;130;10;5;6;280;25;3;1;0.33;68.402973
100% Natural Bran;Q;C;120;3;5;15;2;8;8;135;0;3;1;1;33.983679
All-Bran;K;C;70;4;1;260;9;7;5;320;25;3;1;0.33;59.425505
All-Bran with Extra Fiber;K;C;50;4;0;140;14;8;0;330;25;3;1;0.5;93.704912
Almond Delight;R;C;110;2;2;200;1;14;8;-1;25;3;1;0.75;34.384843
Apple Cinnamon Cheerios;G;C;110;2;2;180;1.5;10.5;10;70;25;1;1;0.75;29.50
9541
Apple Jacks;K;C;110;2;0;125;1;11;14;30;25;2;1;1;33.174094
Basic 4;G;C;130;3;2;210;2;18;8;100;25;3;1.33;0.75;37.038562
```

Challenge Question

```
don@dono:~/Documents/Csv$ awk -F ";" 'NR > 3 {print $1}' cereal.csv
100% Natural Bran
All-Bran
All-Bran with Extra Fiber
Almond Delight
Apple Cinnamon Cheerios
Apple Jacks
```

```
don@dono:~/Documents/Csv$ awk 'NR> 3 { print }' cereal.csv | sort -o cer
eal-sorted.csv cereal.csv
don@dono:~/Documents/Csv$ c
Display all 125 possibilities? (y or n)
don@dono:~/Documents/Csv$ ls
cars.csv     cereal-sorted.csv  country.csv
cereal.csv  contacts.csv        film.csv
don@dono:~/Documents/Csv$ _
```

```
don@dono:~/Documents/Csv$ head cereal.csv
name;mfr;type;calories;protein;fat;sodium;fiber;carbo;sugars;potass;vita
mins;shelf;weight;cups;rating
String;Categorical;Categorical;Int;Int;Int;Int;Float;Float;Int;Int;Int;I
nt;Float;Float;Float
100% Bran;N;C;70;4;1;130;10;5;6;280;25;3;1;0.33;68.402973
100% Natural Bran;Q;C;120;3;5;15;2;8;8;135;0;3;1;1;33.983679
All-Bran;K;C;70;4;1;260;9;7;5;320;25;3;1;0.33;59.425505
All-Bran with Extra Fiber;K;C;50;4;0;140;14;8;0;330;25;3;1;0.5;93.704912
Almond Delight;R;C;110;2;2;200;1;14;8;-1;25;3;1;0.75;34.384843
Apple Cinnamon Cheerios;G;C;110;2;2;180;1.5;10.5;10;70;25;1;1;0.75;29.50
9541
Apple Jacks;K;C;110;2;0;125;1;11;14;30;25;2;1;1;33.174094
Basic 4;G;C;130;3;2;210;2;18;8;100;25;3;1.33;0.75;37.038562
```
```
don@dono:~/Documents/Csv$ awk -F ";" '{OFS=" this brand of cereal haves
calories of "}{print $1,$4}' cereal.csv
name this brand of cereal haves calories of calories
String this brand of cereal haves calories of Int
100% Bran this brand of cereal haves calories of 70
100% Natural Bran this brand of cereal haves calories of 120
All-Bran this brand of cereal haves calories of 70
All-Bran with Extra Fiber this brand of cereal haves calories of 50
Almond Delight this brand of cereal haves calories of 110
Apple Cinnamon Cheerios this brand of cereal haves calories of 110
```