INF 503 Homework 1

Problem #1 and Problem #2

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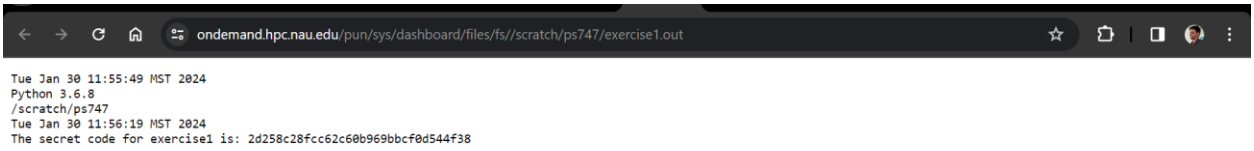
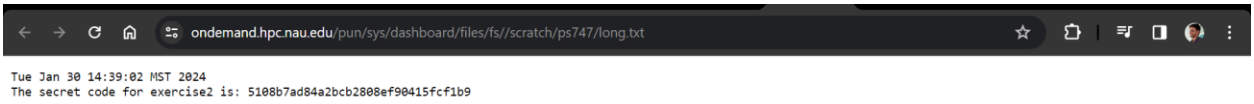
Problem #1 (of 2): Monsoon account creation and workshop

Exercise 1:

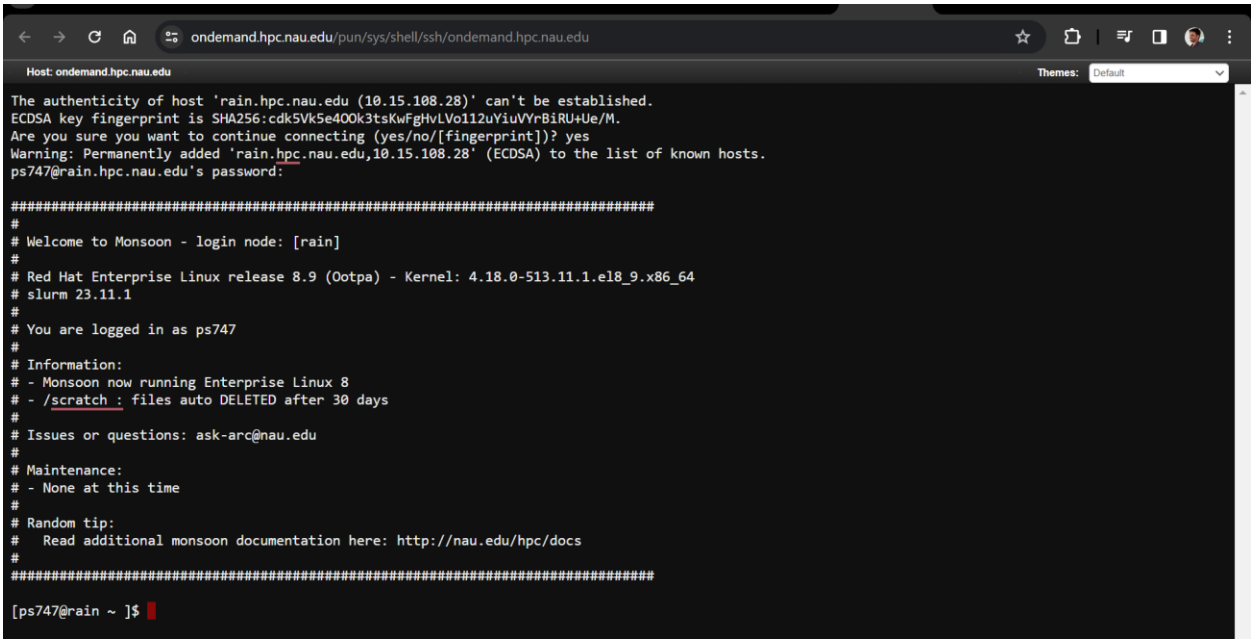



```
Tue Jan 30 11:55:49 MST 2024
Python 3.6.8
/scratch/ps747
Tue Jan 30 11:56:19 MST 2024
The secret code for exercise1 is: 2d258c28fcc62c60b969bbcf0d544f38
```

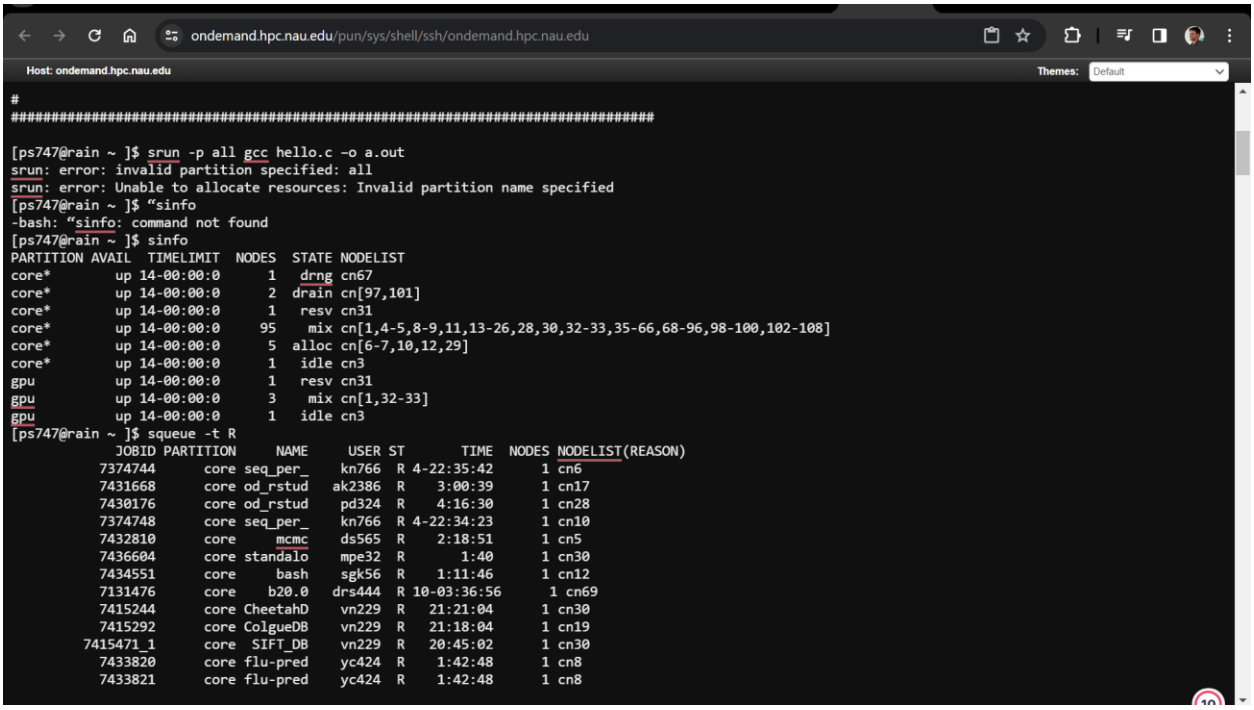
Exercise 2:




```
Tue Jan 30 14:39:02 MST 2024
The secret code for exercise2 is: 5108b7ad84a2bcb2808ef90415fcf1b9
```



Exercise 3: Via cli



1. How many nodes make up a monsoon? – Hint: use “sinfo”

Ans: The Monsoon cluster has 105 nodes in total. The GPU division consists of five nodes.

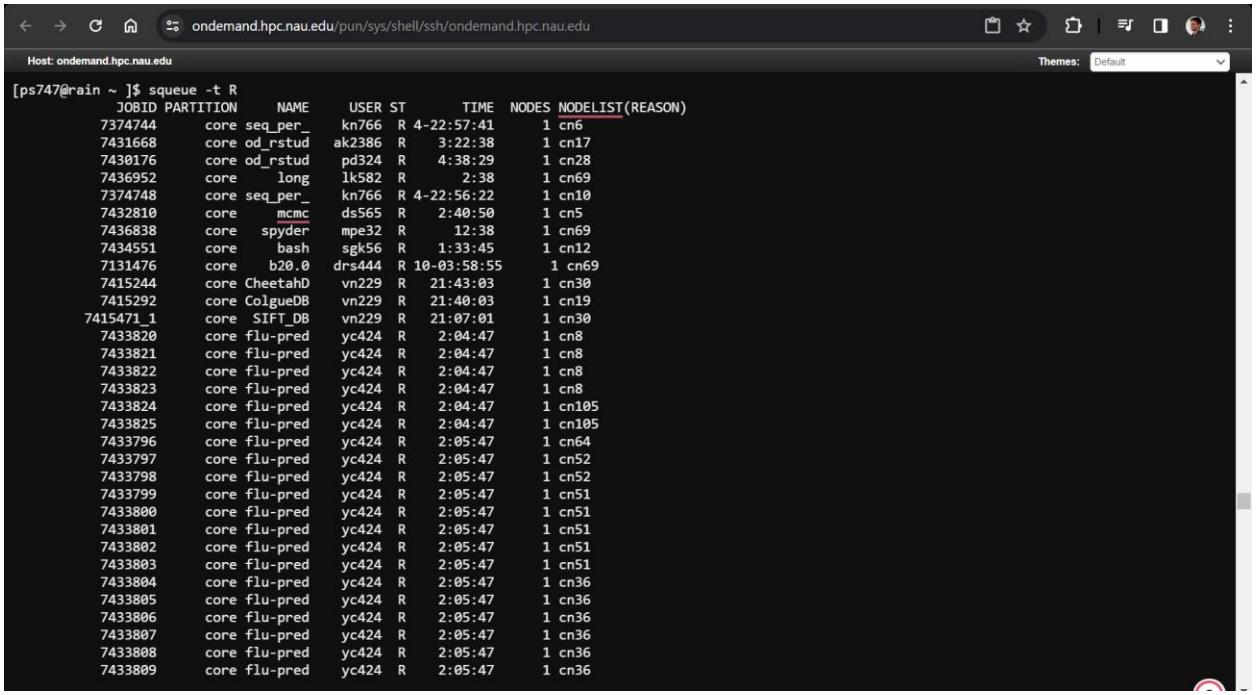
2. How many nodes are in the GPU partition?

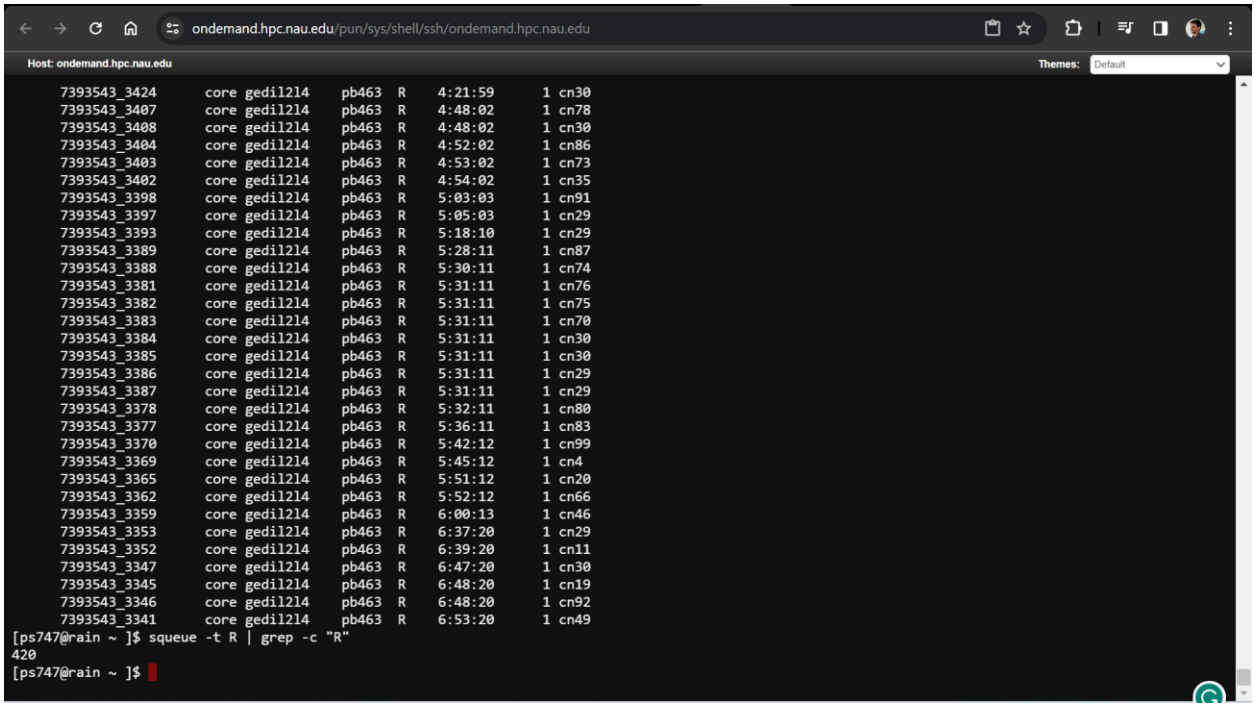
Ans: The GPU division consists of five nodes.

3. How many jobs are currently running? – Hint: use “squeue -t R”

Ans: On the cluster, 420 jobs are executing right now.

The below screenshot shows that the current running has 420 jobs that are executing right now.



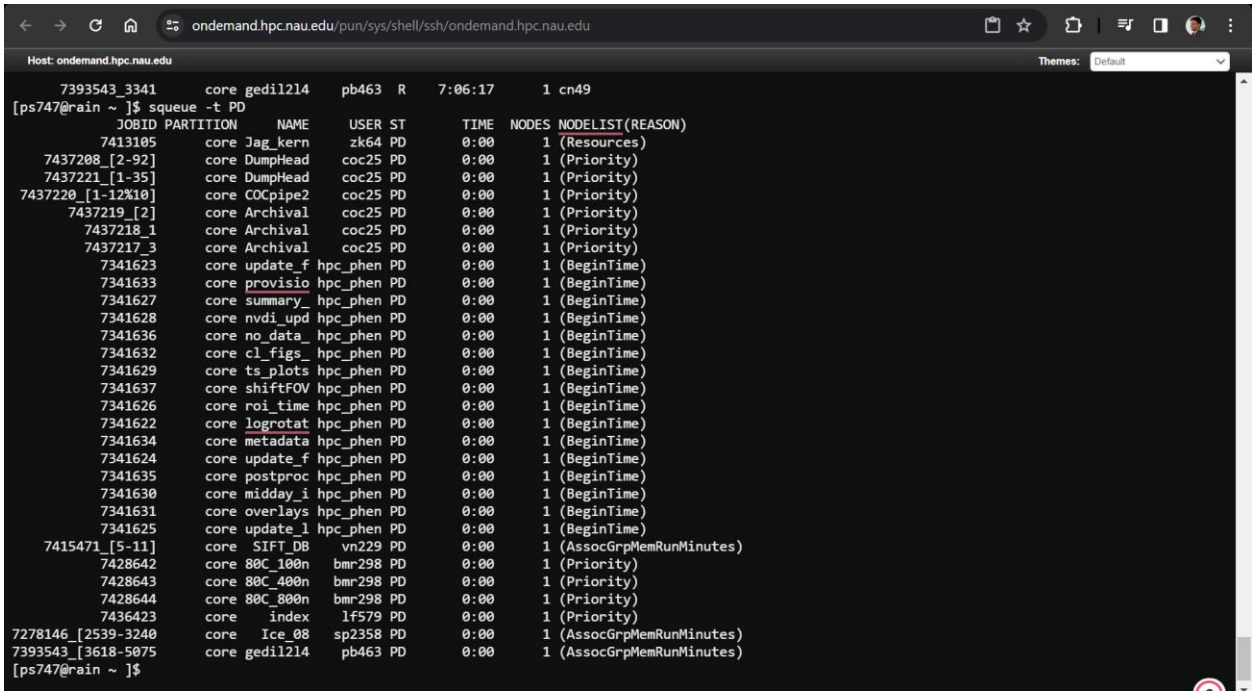


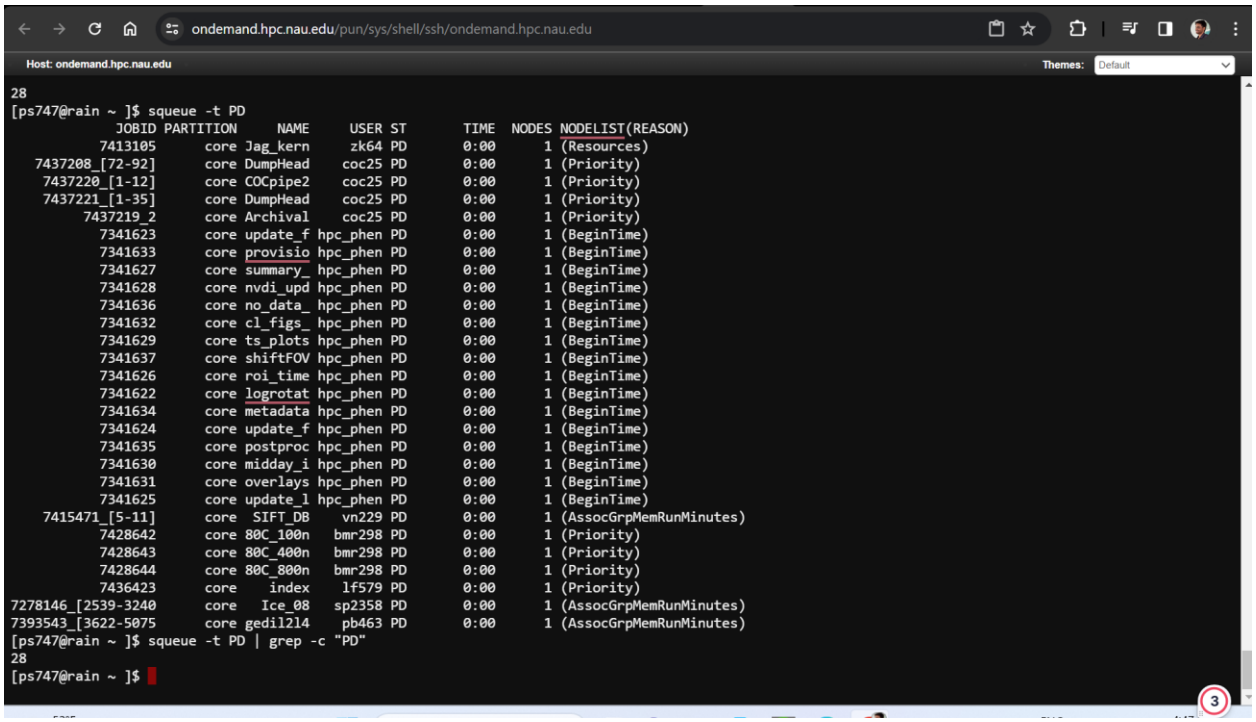
[ps747@rain ~]$ squeue -t R | grep -c "R"

420

[ps747@rain ~]$

4. How many jobs are currently pending? Why? – Hint: use “squeue –t PD”



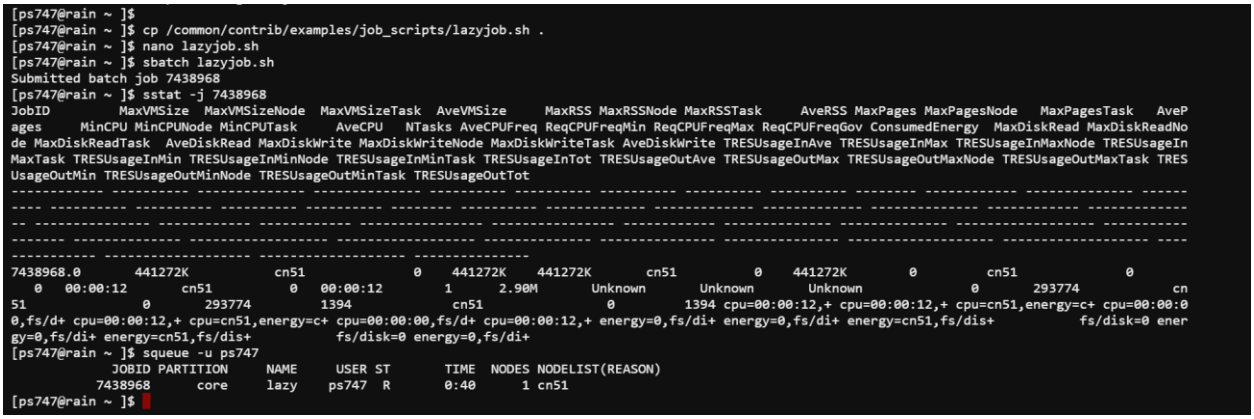


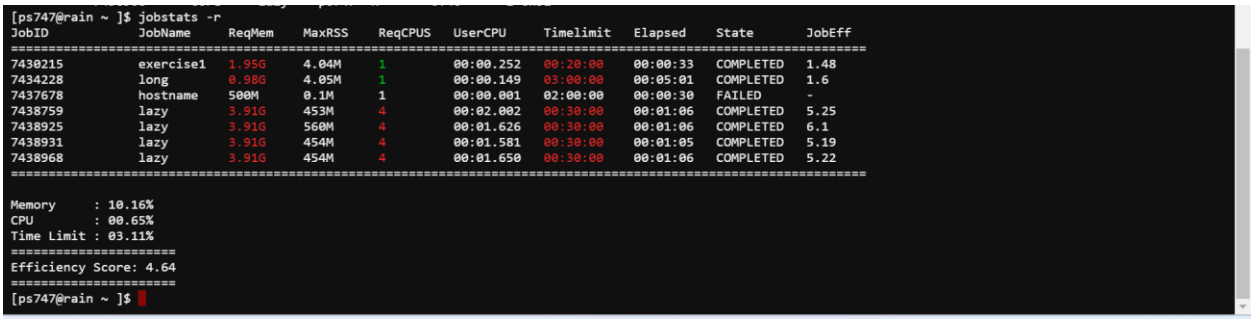
[ps747@rain ~]$ squeue -t PD | grep -c "PD"

28

- 28 jobs are currently pending.

Exercise 4 via CLI





[ps747@rain ~]$ jobstats -rJobID JobName ReqMem MaxRSS ReqCPUS UserCPU Timelimit Elapsed State JobEff

==========

==========7430215 exercise1 1.95G 4.04M 1 00:00.252 00:20:00 00:00:33 COMPLETED 1.48 7434228 long 0.98G 4.05M 1 00:00.149 03:00:00 00:05:01 COMPLETED 1.6 7437678 hostname 500M 0.1M 1 00:00.001 02:00:00 00:00:30 FAILED - 7438759 lazy 3.91G 453M 4 00:02.002 00:30:00 00:01:06 COMPLETED 5.25 7438925 lazy 3.91G 560M 4 00:01.626 00:30:00 00:01:06 COMPLETED 6.1 7438931 lazy 3.91G 454M 4 00:01.581 00:30:00 00:01:05 COMPLETED 5.19 7438968 lazy 3.91G 454M 4 00:01.650 00:30:00 00:01:06 COMPLETED 5.22

==========

Memory: 10.16%

CPU: 00.65%

Time Limit: 03.11%

Efficiency Score: 4.64

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Below are the MaxRSS values separately:

[ps747@rain ~]$ jobstats -r | awk 'NR > 2 {print $4}'

4.04M

4.05M

0.1M

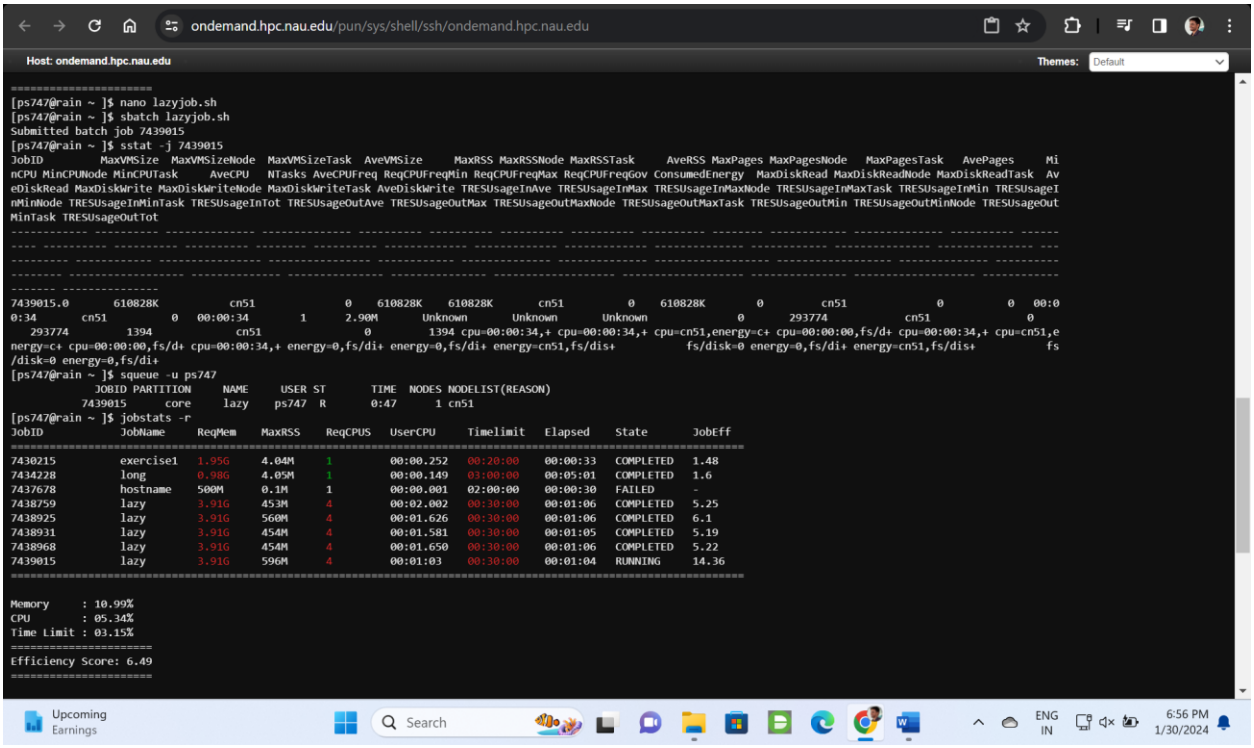
453M

560M

454M

454M

e.g. --mem=600



Memory: 10.99%

CPU: 05.34%

Time Limit: 03.15%

Efficiency Score: 6.49

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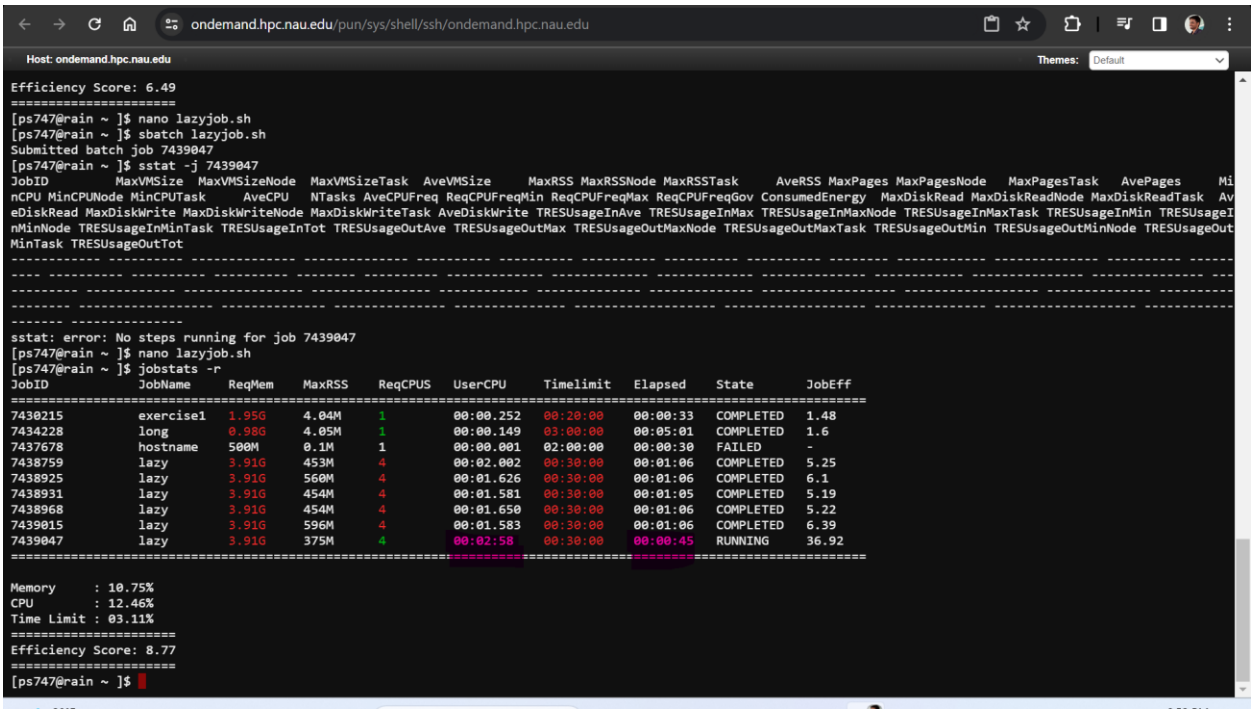
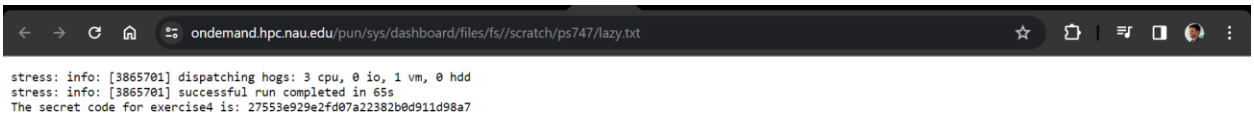
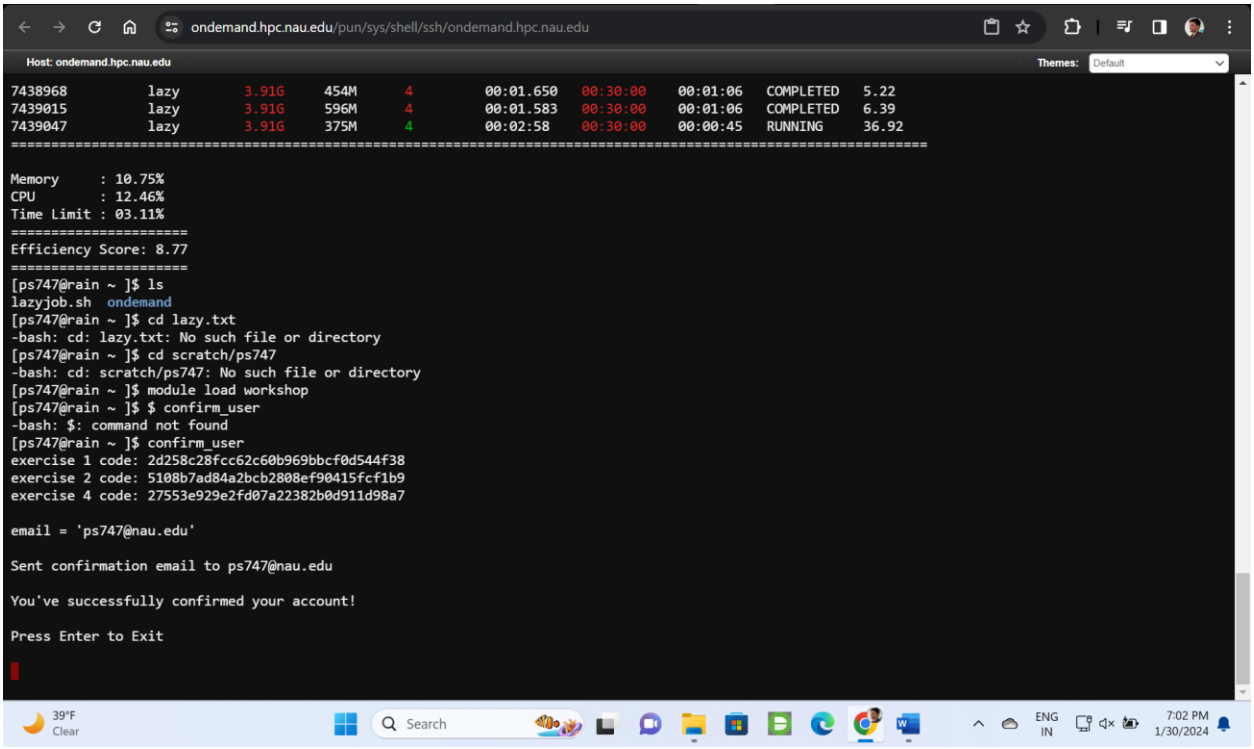
Edit the lazy job script, comment out the first srun command, and uncomment the second srun command.



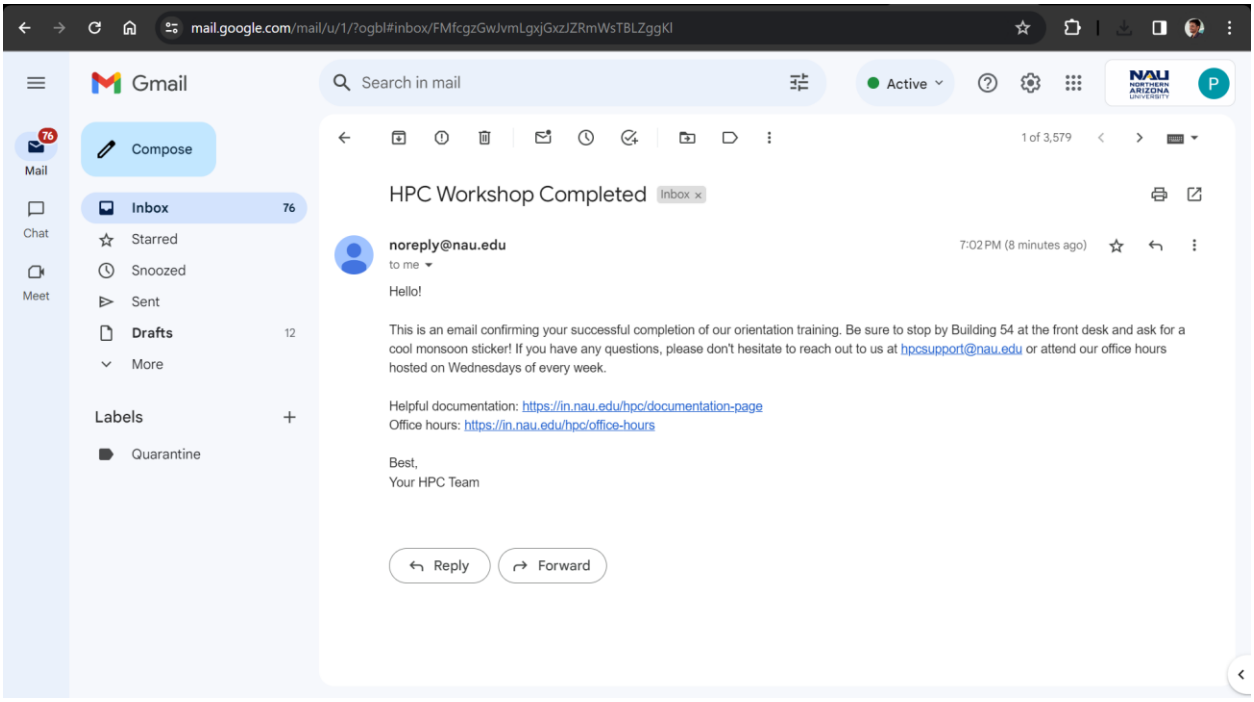


secret code from lazy.txt:

```
stress: info: [3865701] dispatching hogs: 3 cpu, 0 io, 1 vm, 0 hdd
stress: info: [3865701] successful run completed in 65s
The secret code for exercise4 is: 27553e929e2fd07a22382b0d911d98a7
```




```
[ps747@rain ~ ]$ module load workshop

[ps747@rain ~ ]$ $ confirm_user
-bash: $: command not found

[ps747@rain ~ ]$ confirm_user

exercise 1 code: 2d258c28fcc62c60b969bbcf0d544f38

exercise 2 code: 5108b7ad84a2bcb2808ef90415fcf1b9

exercise 4 code: 27553e929e2fd07a22382b0d911d98a7

email = 'ps747@nau.edu'

Sent confirmation email to ps747@nau.edu

You've successfully confirmed your account!

Press Enter to Exit
```



Problem #2 (of 2): basic text processing

Below is the execution process and steps with commands for problem 2 of homework assignment 1:

Commands:

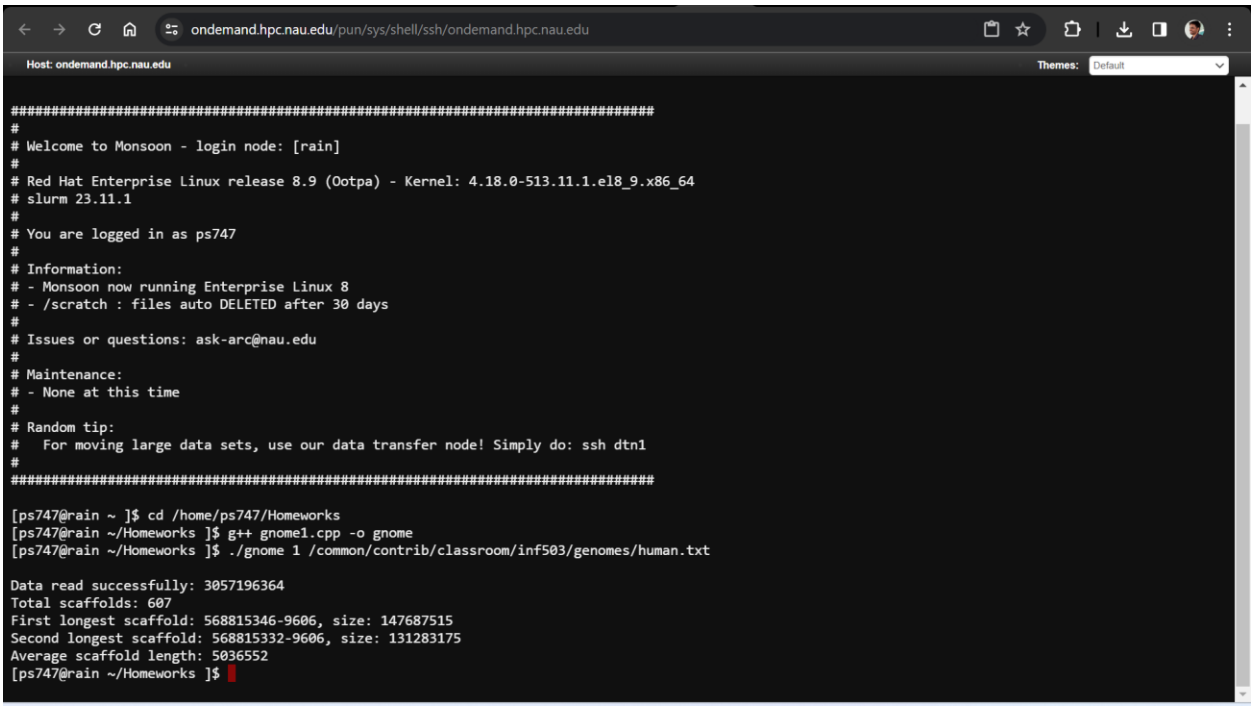
Use the command **'g++ gnome1.cpp -o gnome'** to compile the genome.cpp file.

Next, run the code by executing the below command to run the executable file:

./gnome 1 /common/contrib/classroom/inf503/genomes/human.txt

[ps747@rain ~/Homeworks]$ **g++ gnome1.cpp -o gnome**
[ps747@rain ~/Homeworks]$ **./gnome 1 /common/contrib/classroom/inf503/genomes/human.txt**

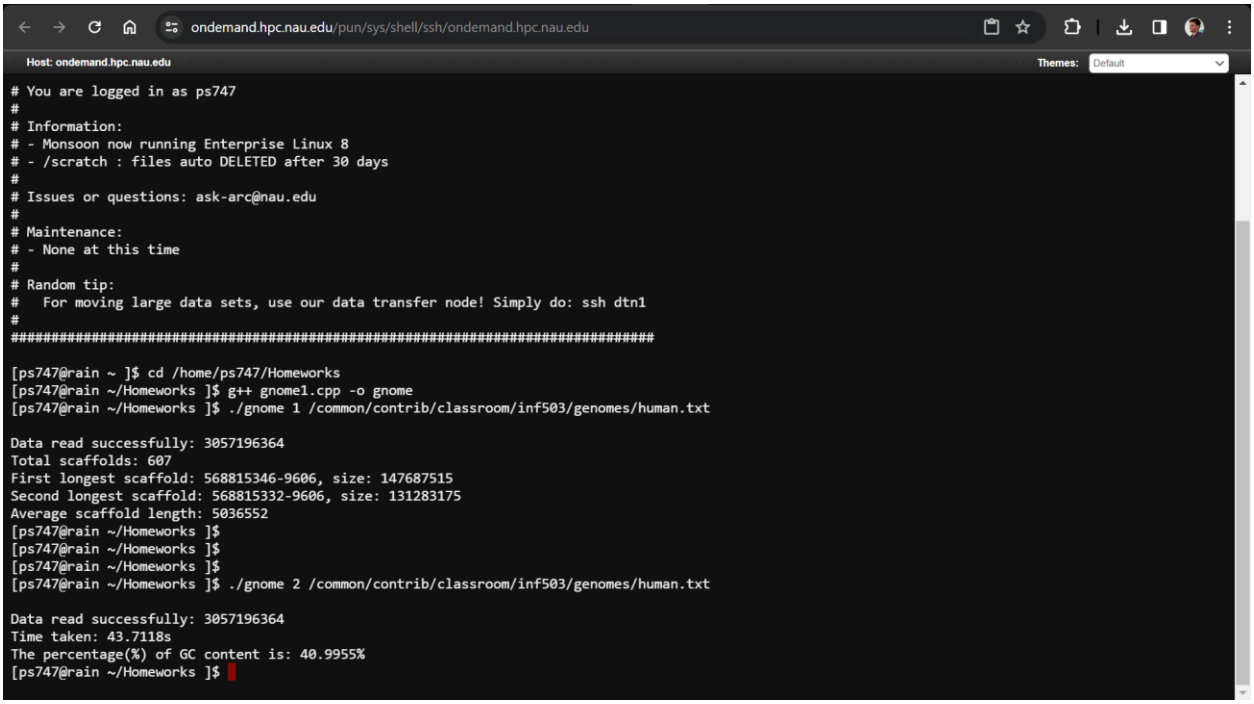
Output screenshot for problem 1:



To execute part 2 of homework 1, please use the below command.

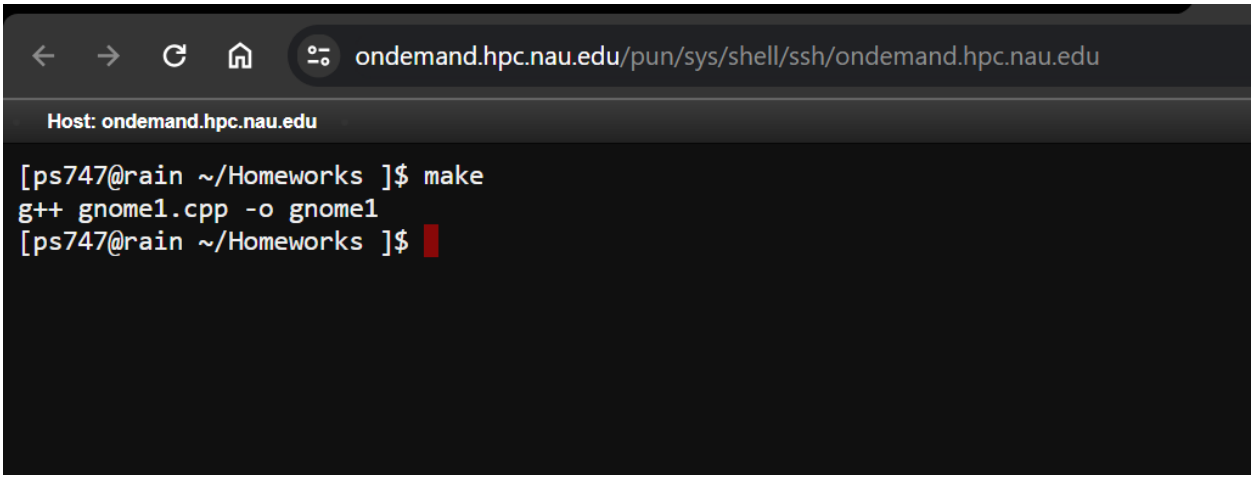
./gnome 2 /common/contrib/classroom/inf503/genomes/human.txt

Output screenshot for problem 2:



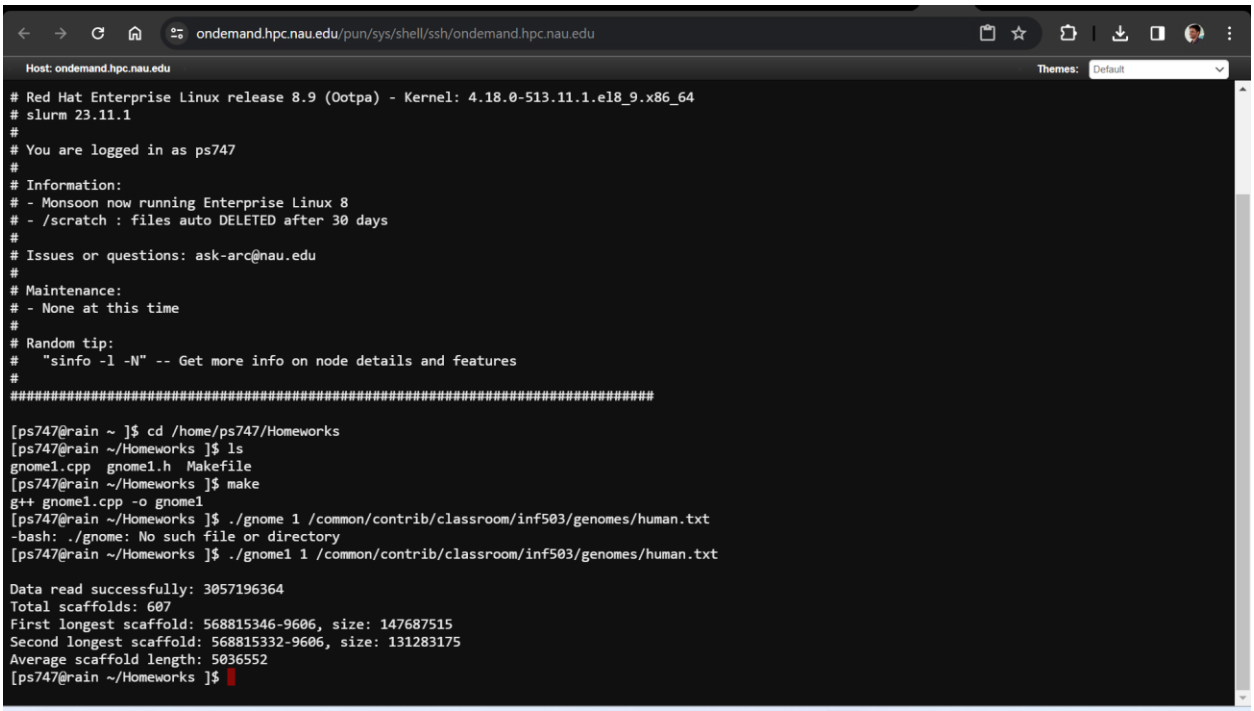
Execution using makefile:

Enter the **make** command to run the **Makefile** as below in the command line:



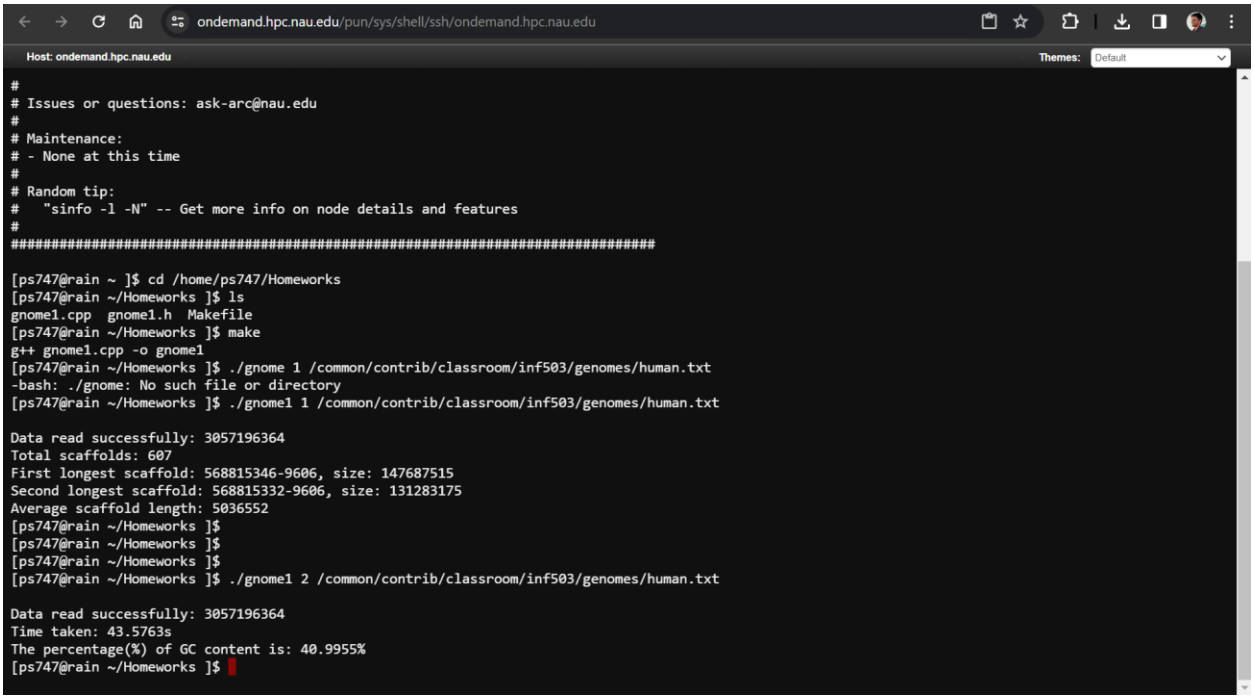
Next, run the code by executing the below command to run the executable file:

./gnome1 1 /common/contrib/classroom/inf503/genomes/human.txt



To execute part 2 of homework 1, please use the below command.

./gnome1 2 /common/contrib/classroom/inf503/genomes/human.txt



1. How many scaffolds were there?

A. `Total scaffolds: 607`

2. What was the longest and 2nd longest scaffold? Provide names of scaffolds and lengths.

A.

B. `First longest scaffold: 568815346-9606, size: 147687515`

`Second longest scaffold: 568815332-9606, size: 131283175`

3. What was the average scaffold length?

A. `Average scaffold length: 5036552`

4. How long does it take (in seconds) to execute this function? Hint: You will need to use system time within your code to get accurate time estimates.

A. `Time taken: 43.5763s`

5. What was the GC content of the human genome (percent of C's and G's in the genome)?

A. `The percentage(%) of GC content is: 40.9955%`