**INF 503 Homework 1**

**Problem #1 and Problem #2**

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

**Exercise 1:**

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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:**

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Tue Jan 30 14:39:02 MST 2024

The secret code for exercise2 is: 5108b7ad84a2bcb2808ef90415fcf1b9

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**Exercise 3: Via cli**

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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.

1. How many nodes are in the GPU partition?

Ans: The GPU division consists of five nodes.

1. 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.

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A screenshot of a computer

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

**420**

[ps747@rain ~ ]$

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

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A screenshot of a computer

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

28

* 28 jobs are currently pending.

**Exercise 4 via CLI**

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**A screen shot of a computer

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[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

**A screenshot of a computer

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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.

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**A screen shot of a computer

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**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

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Description automatically generated

[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](mailto:ps747@nau.edu)

You've successfully confirmed your account!

Press Enter to Exit

**A screenshot of a computer

Description automatically generated**

**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.

Top of Form

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:**

**A screenshot of a computer

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

Top of Form

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

**Output screenshot for problem 2:**  
**A screenshot of a computer

Description automatically generated**

**Execution using makefile:**

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

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

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

A screenshot of a computer

Description automatically generated

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

Top of Form

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

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1. How many scaffolds were there?
2. Total scaffolds: 607
3. What was the longest and 2nd longest scaffold? Provide names of scaffolds and lengths.
4. First longest scaffold: 568815346-9606, size: 147687515

Second longest scaffold: 568815332-9606, size: 131283175

1. What was the average scaffold length?
2. Average scaffold length: 5036552
3. 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.
4. Time taken: 43.5763s
5. What was the GC content of the human genome (percent of C’s and G’s in the genome)?
6. The percentage(%) of GC content is: 40.9955%