Lab Notebook

AISHWARYA DWIVEDI

for

SUMMER INTERNSHIP

May 26th, 2025- July 21st, 2025

Table of Contents

2. Learning how to use FASTQC and fastp.

May 26th

1. Creating GitHub repository

For collaborative work and sharing my progress, I created a GitHub repository and a Lab notebook file.

2. Catching up and continuing- Chapter 1 (Learning the Bash Shell)

Before the start of the Internship, I had already started studying the book "Learning the Bash Shell" until 1.6- Files. Today I restarted my study from that chapter. Also, I documented everything from chapter 1 into a .txt file. A catch up of all of the commands I learnt and what they do is provided in the *chapter1.txt* file.

May 27th

1. Studying Chapter 2 and documenting

Today, I started with learning and documenting chapter 2 of the book where I learnt command-line editing and how to navigate bash using keyboard combinations. Because on my system the default editor is *emacs*, I learnt its keyboard shortcuts. Everything from this chapter is documented in the *chapter2.txt* file.

2. Studying Chapter 3 and documenting

I then moved onto Chapter 3, *Customizing your environment*. This chapter's documentation is provided in the *chapter3.txt* file. The chapter comprises of information about special files, aliases, options and variables and how they are useful in various scenarios.

3. Starting Chapter 4

I also studied Chapter 4, where Shell programming actually starts.

May 28th

1. Continuing Chapter 4

Today, I continued learning chapter 4 and learnt in detail about different types of variables and also put together a GC counter which counts the number of G and C nucleotides in a sequence. This can be referred to in *chapter4.txt.*

May 29th

1. Working further on GC content calculator

I continued working on my GC content calculator as I was having troubles with debugging the code and assigning variables to inputted values. I was able to write a code using files as input,

but not user input sequences. So, I worked on correcting that. I was able to successfully complete that code by 11:33 AM and I uploaded it on Google Classroom.

2. Finishing Chapter 4

I also completed chapter 4. The entire documentation is available in the file *chapter4.txt*.

3. Working on Chapter 5 and Documenting

I wrote codes for learning if/else and for and while loop.

May 30th

1. Building a file recognizer

Today, I worked on a file recognizer that based on the contents of the file, can tell whether it is a FASTA, FASTQ, SAM or VCF file. It was made to understand the concept of logical AND operator and if-elif-else conditionals. The code can be found on Google Classroom and on my GitHub repository with the file name *file_recognizer*.

2. Finishing Chapter 5

Today I also completed chapter 5 with numerous examples and all syntaxes mentioned in the file *chapter5.txt*. The chapter discussed if-elif else, for, while, until, case and select in detail.

3. Building a FASTA analyser

I also worked on a code for learning for loop and understanding functions. The code will take multiple files as input and determine the FASTA files among them.

4. Writing a code that displays a menu using *select* command

I also wrote a code that displays a menu, and the user can navigate that menu for doing different tasks like getting present directory information etc.

May 31st

1. Shooting, compiling and uploading weekly video

I compiled my study material and notes and summarized it for shooting the weekly video. I then shot the video and uploaded it onto YouTube. I also shared it on the Google Classroom.

June 2nd

1. Studying Chapter 6

I started working on chapter 6, on making the documentation for it and learning the chapter as well. The documentation is available in *chapter6.txt*.

June 3rd

1. Completing Chapter 6

Today, I completed learning chapter 6. Chapter 6 discussed various types of variables in detail, including arithmetic variables. We then discussed arrays in detail, how to assign elements to an array and how to remove elements as well.

2. Starting Chapter 7

I also started chapter 7 which discusses Input/Output and Command-Line Processing. The documentation is available in *chapter7.txt* file.

June 4th

1. Continuing Chapter 7

I continued studying and documenting chapter 7 today. Learnt the printf command and revised the echo command.

June 5th

1. Completing Chapter 7

I completed chapter 7 today and wrote a code to practically apply the concepts learnt in chapter 7. The code needed some debugging, but it worked fine afterwards. The code was written to learn concepts of *read, printf, echo and {} and ().* The entire documentation is available in the *chapter7.txt* file.

2. Learning how to use FASTQC and fastp

Today I learnt how to use FASTQC for analysing .fastq files. After learning about the quality of the sequence, I also learnt how to use fastp to preprocess these .fastq files to remove adapter sequences and other impurities.