Computing Basics for Bioinformatics on the Cloud

Session 2

Yaoyu Wang

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Overview

- Introduction to cloud computing
- Get on to the cloud
- Get around on the cloud with linux
- Free bioinformatics resources on the cloud

- Download slide at:

http://tinyurl.com/cccbtrain

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What is Cloud Computing?

Cloud Computing is a general term used to describe a network based computing that takes place over the Internet

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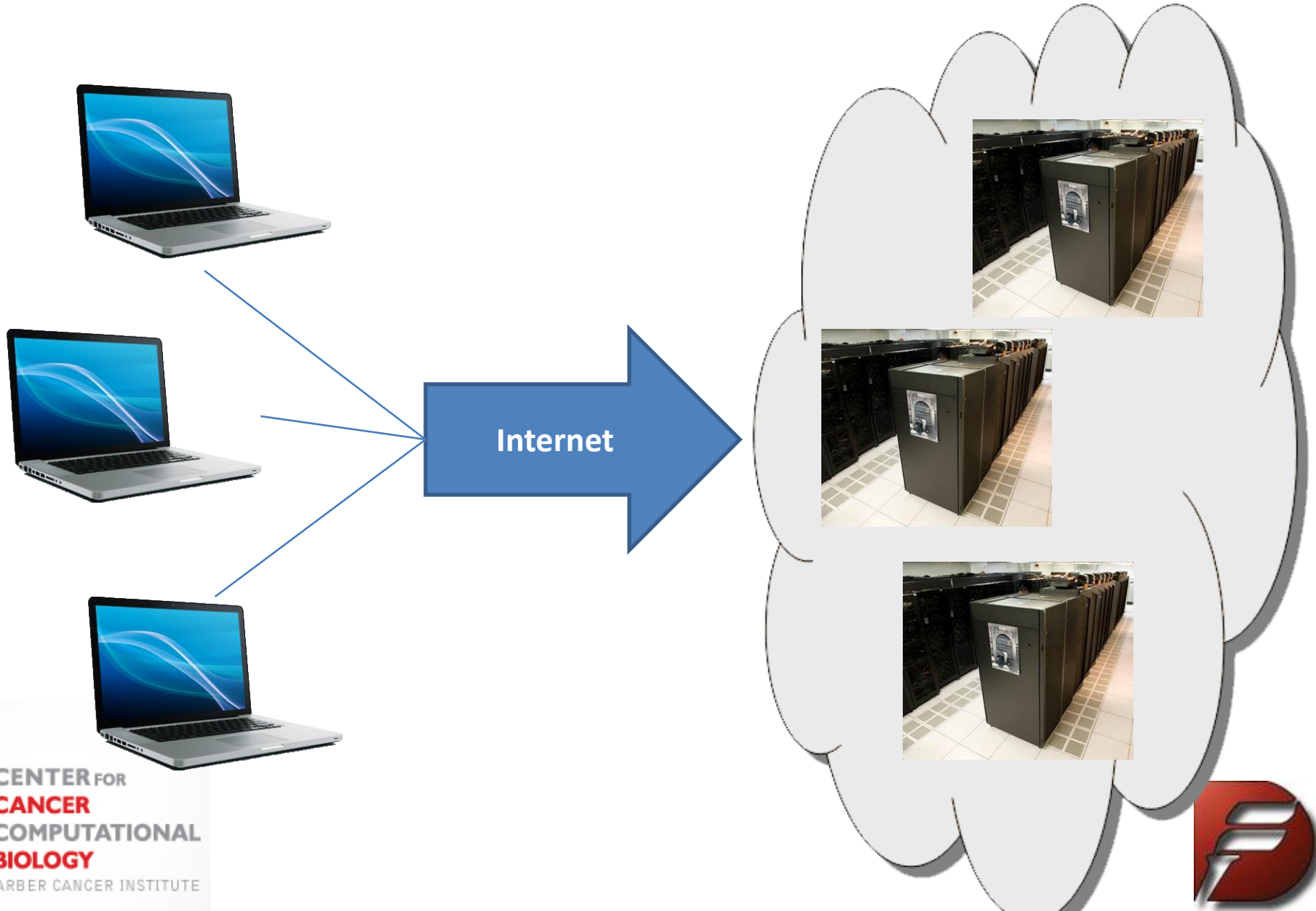
Overly Simplistic Cloud Computing Schema



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Basic Cloud Characteristics

- The "flexibility and elasticity" allows these systems to scale up and down at will – utilising the resources of all kinds (CPU, storage, server capacity, load balancing, and databases).
- The "pay as much as used and needed" type of utility computing and the "always on!, anywhere and any place" type of network-based computing.
- The "no-need-to-know" in terms of the underlying details of infrastructure, applications interface with the infrastructure via the APIs.

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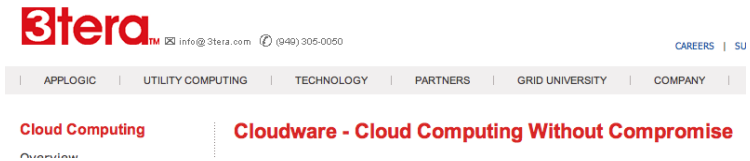
Some Commercial Cloud Offerings



Amazon Web Services

- Elastic Compute Cloud (EC2)
  - Rent computing resources by the hour
  - Basic unit of accounting = instance-hour
  - Additional costs for bandwidth
- Elastic Block Storage (EBS)
  - Persistent storage
  - Charge by provision block
  - Additional costs for bandwidth

Cloud Computing

Quick-start an Amazon EC2 instance…

Cloud Computing

Running a server on Amazon Web Service (AWS) requires you to go through the following steps:

1. Create your account on Amazon (if you do not already have one) and setup your credentials
2. Install Amazon EC2 API Tools
3. Instantiate your **image** (i.e. your account)
4. Configure your **instance** (i.e. your virtual machine)

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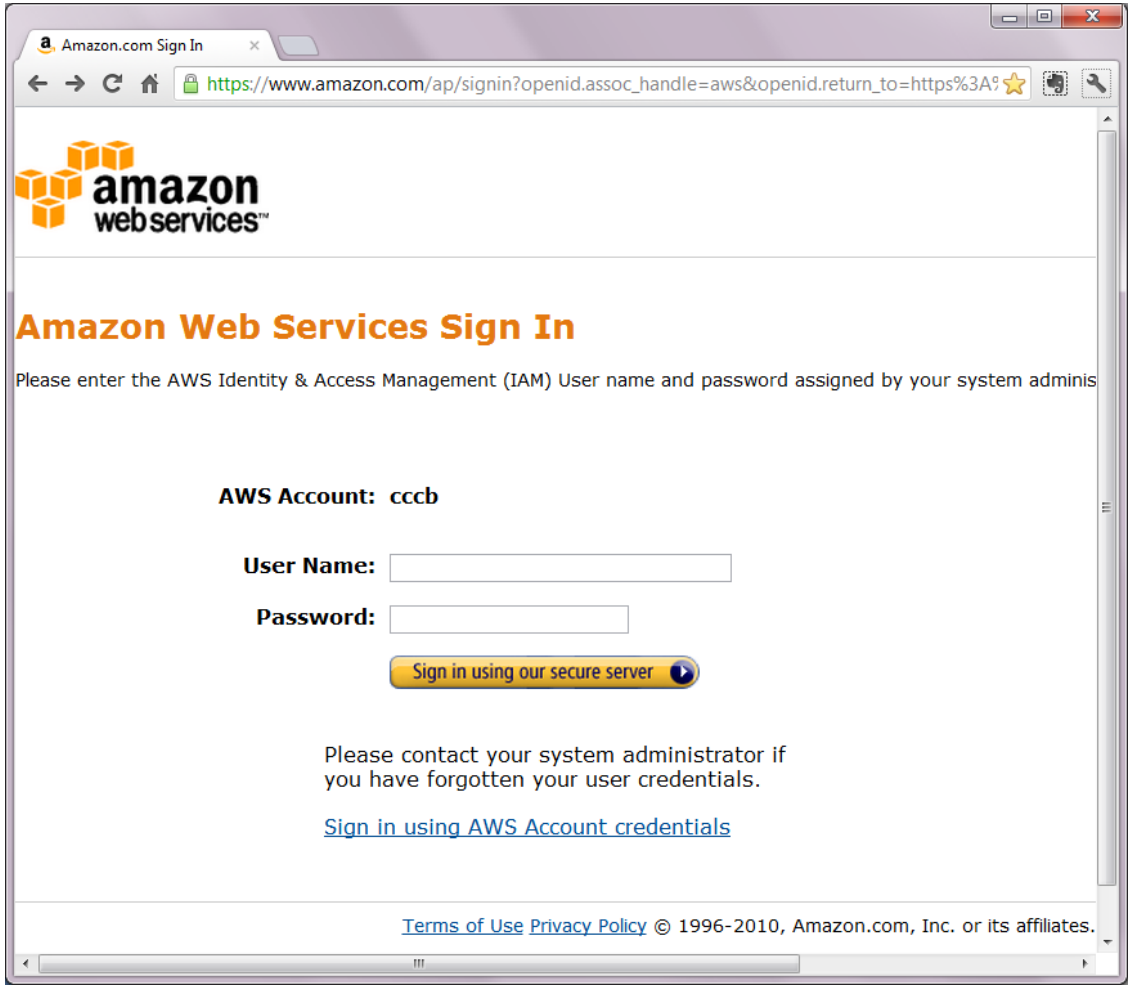
Cloud Computing: Start the Machine

http://aws.amazon.com/



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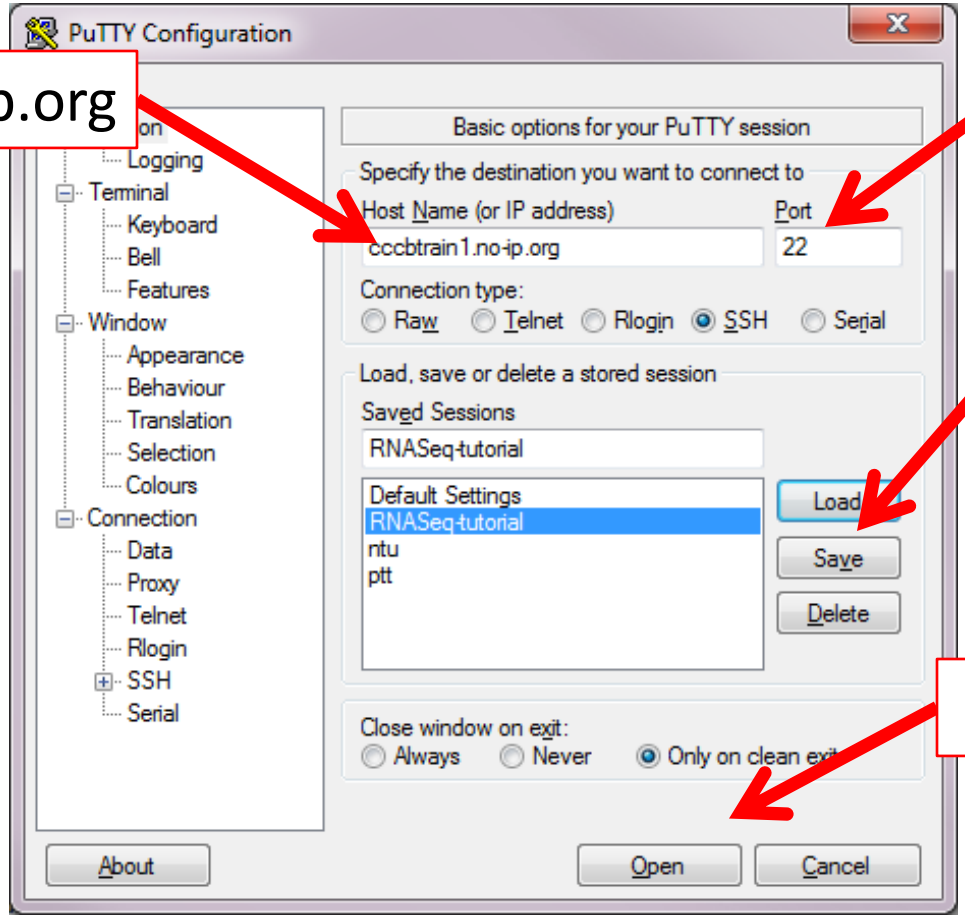
Cloud Computing: Logging in

For Windows

Download PuTTY at: http://tinyurl.com/putty-d



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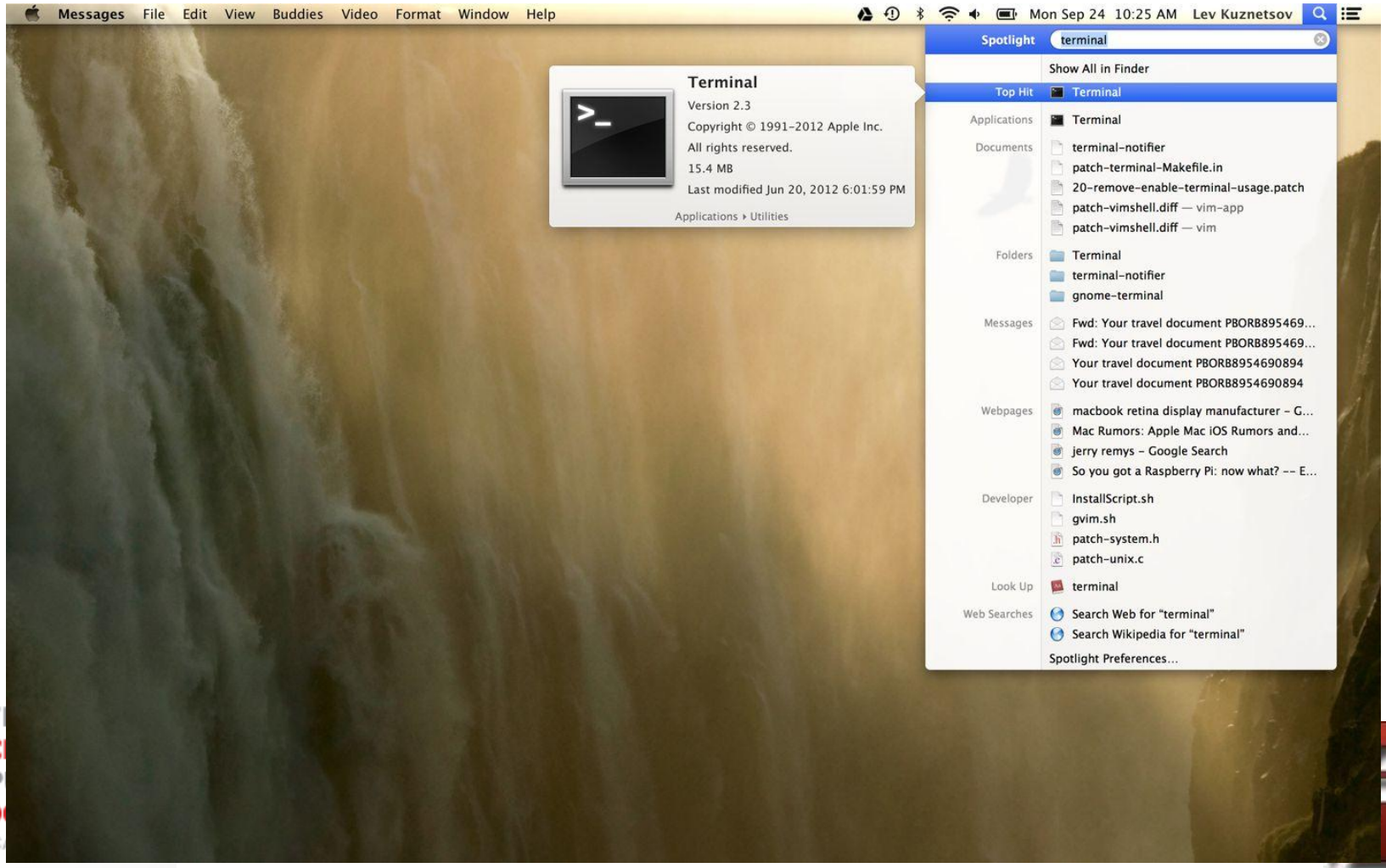
Cloud Computing: Logging in

For Mac

You already have the necessary program pre-installed



Cloud Computing: Logging in

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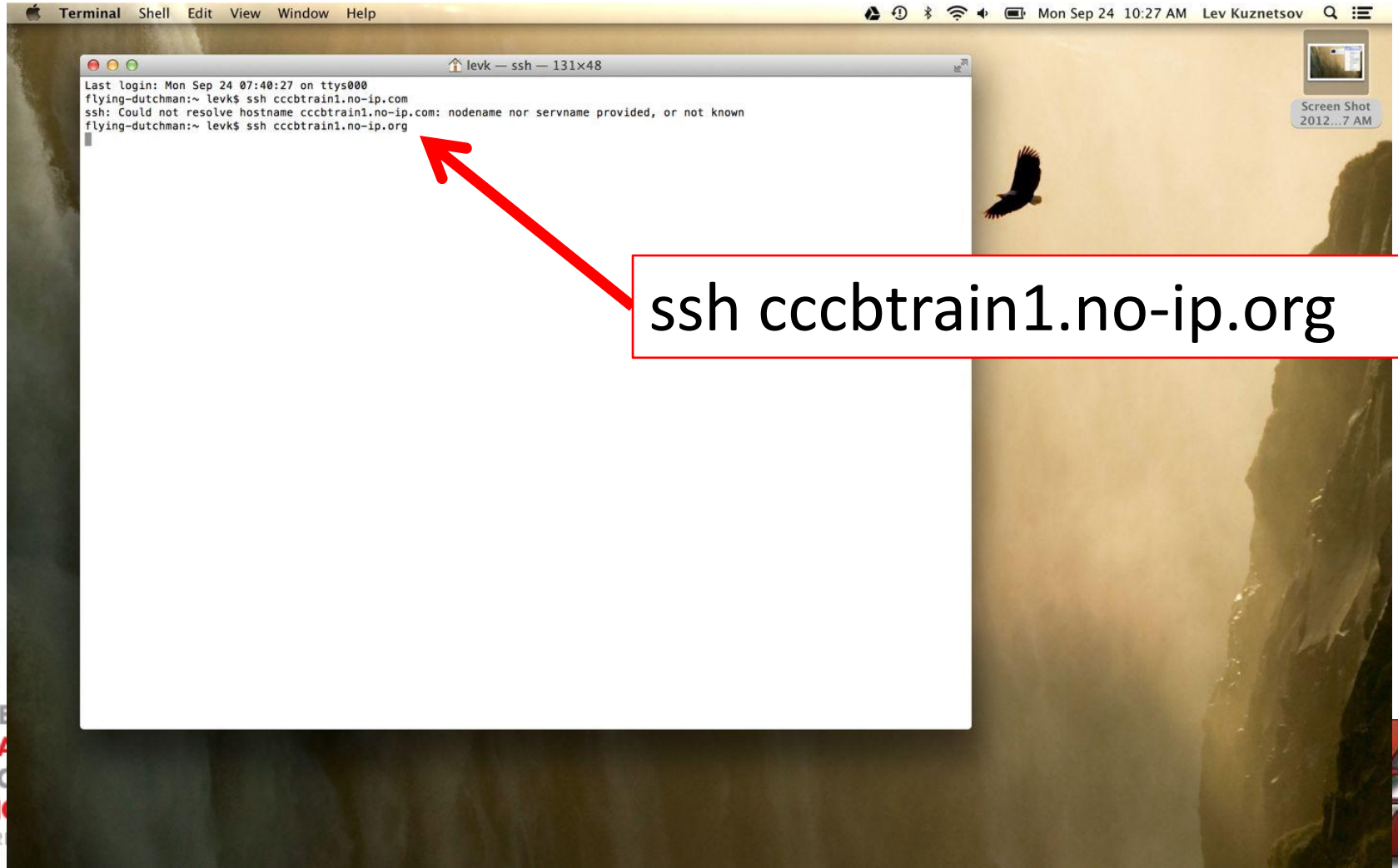
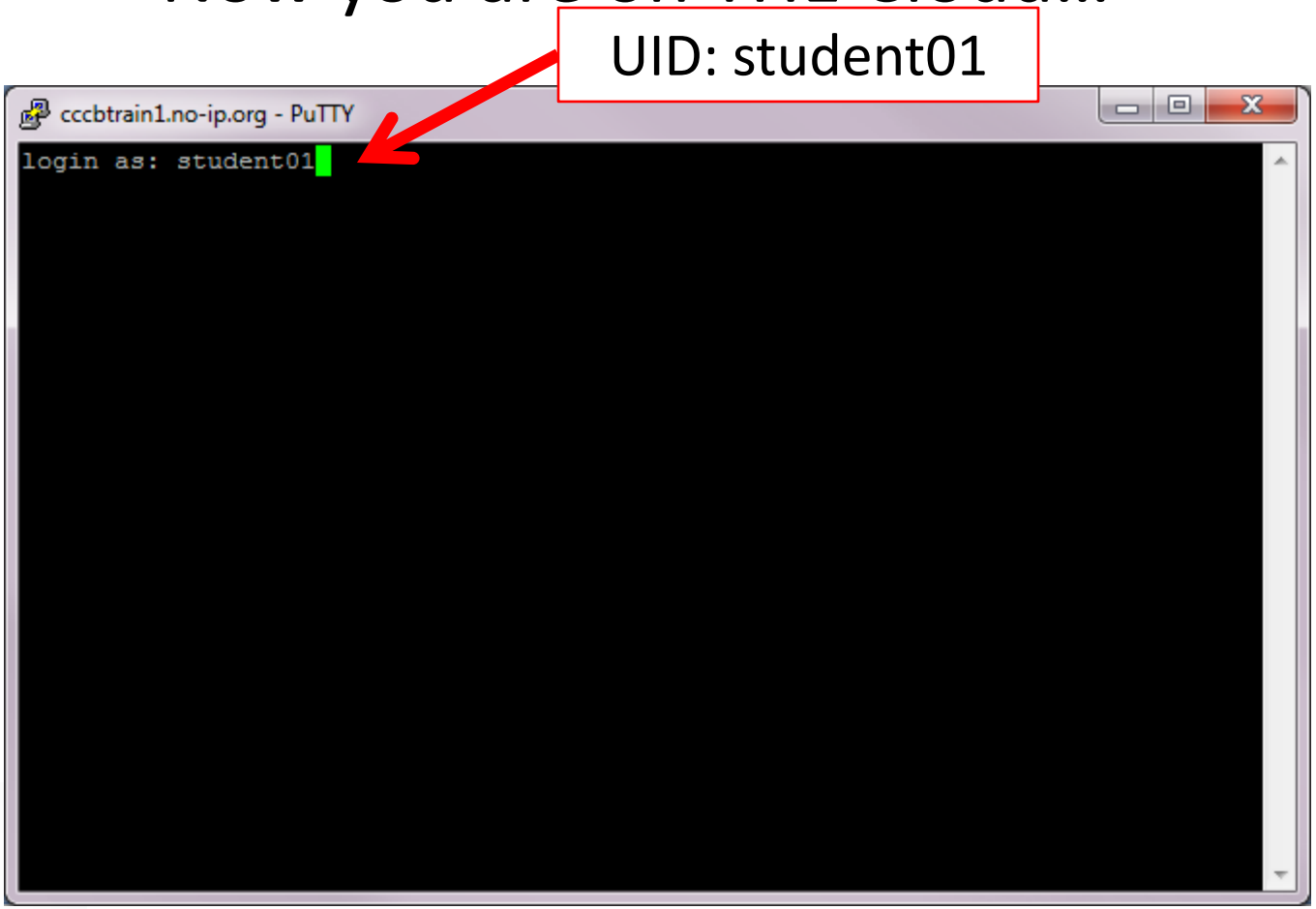


Cloud Computing: Logging in

Now you are on THE Cloud…



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Cloud Computing: Logging in

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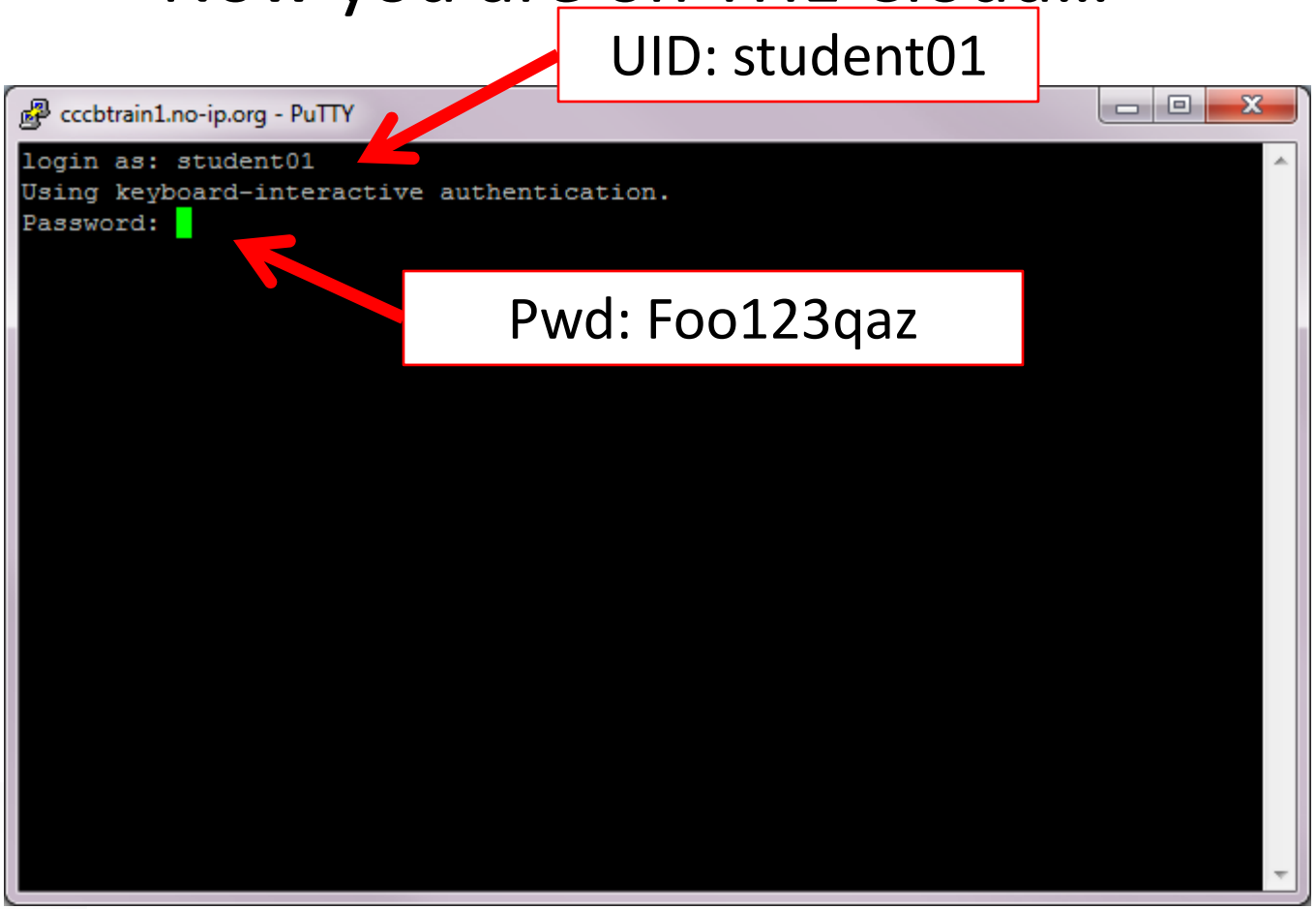

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Cloud Computing: Logging in

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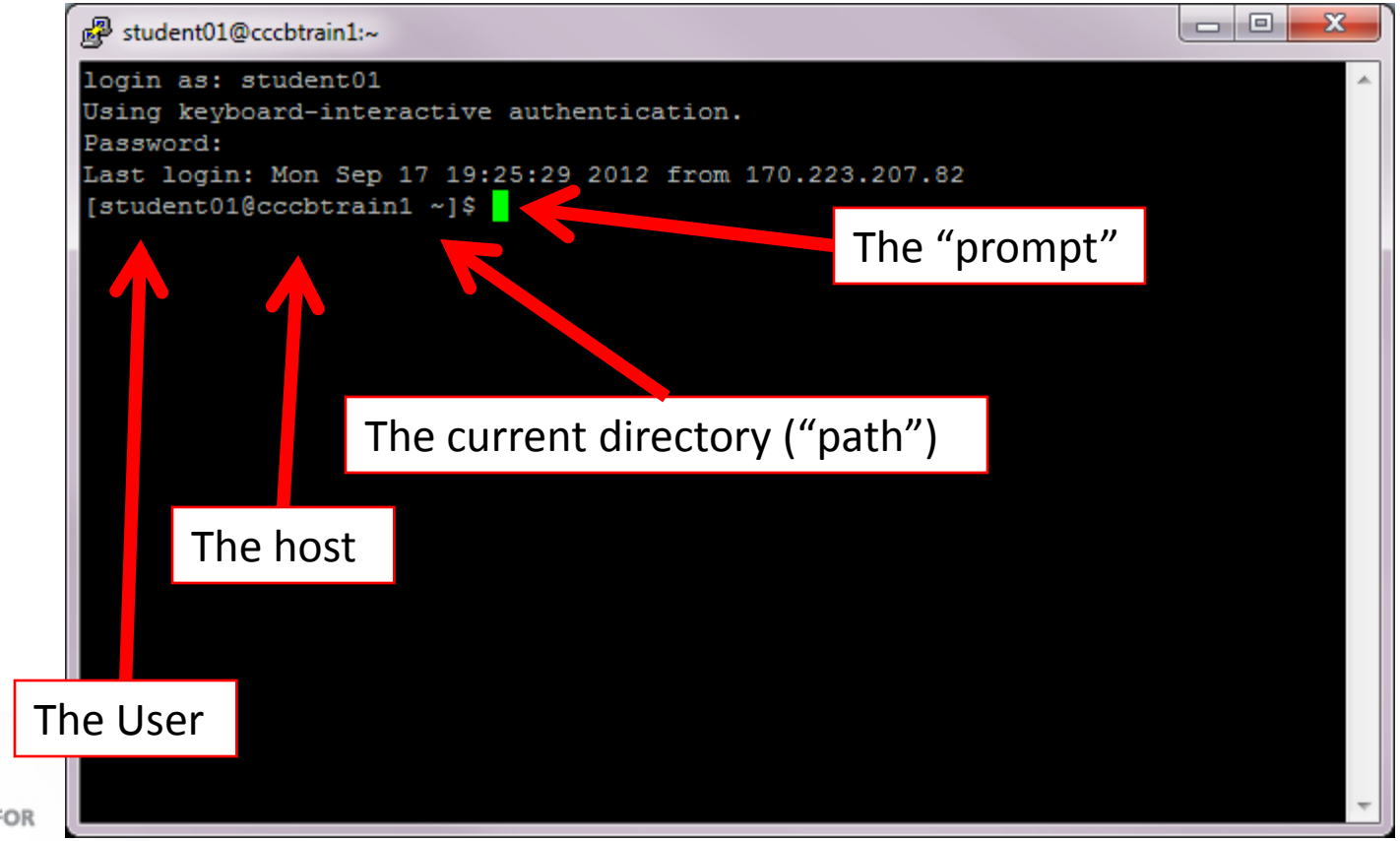

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Cloud Computing

How to navigate around the Cloud?

(a.k.a Linux Basics)

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What exactly is a “shell”?

- After logging in, Linux/Unix starts another program called the **shell**
- The shell interprets commands the user types and manages their execution
    - The shell communicates with the internal part of the operating system called the **kernel**
    - The most popular shells are: tcsh, csh, korn, and bash
    - The differences are most times subtle
    - For this tutorial, we are using bash
- Shell commands are **CASE SENSITIVE!**

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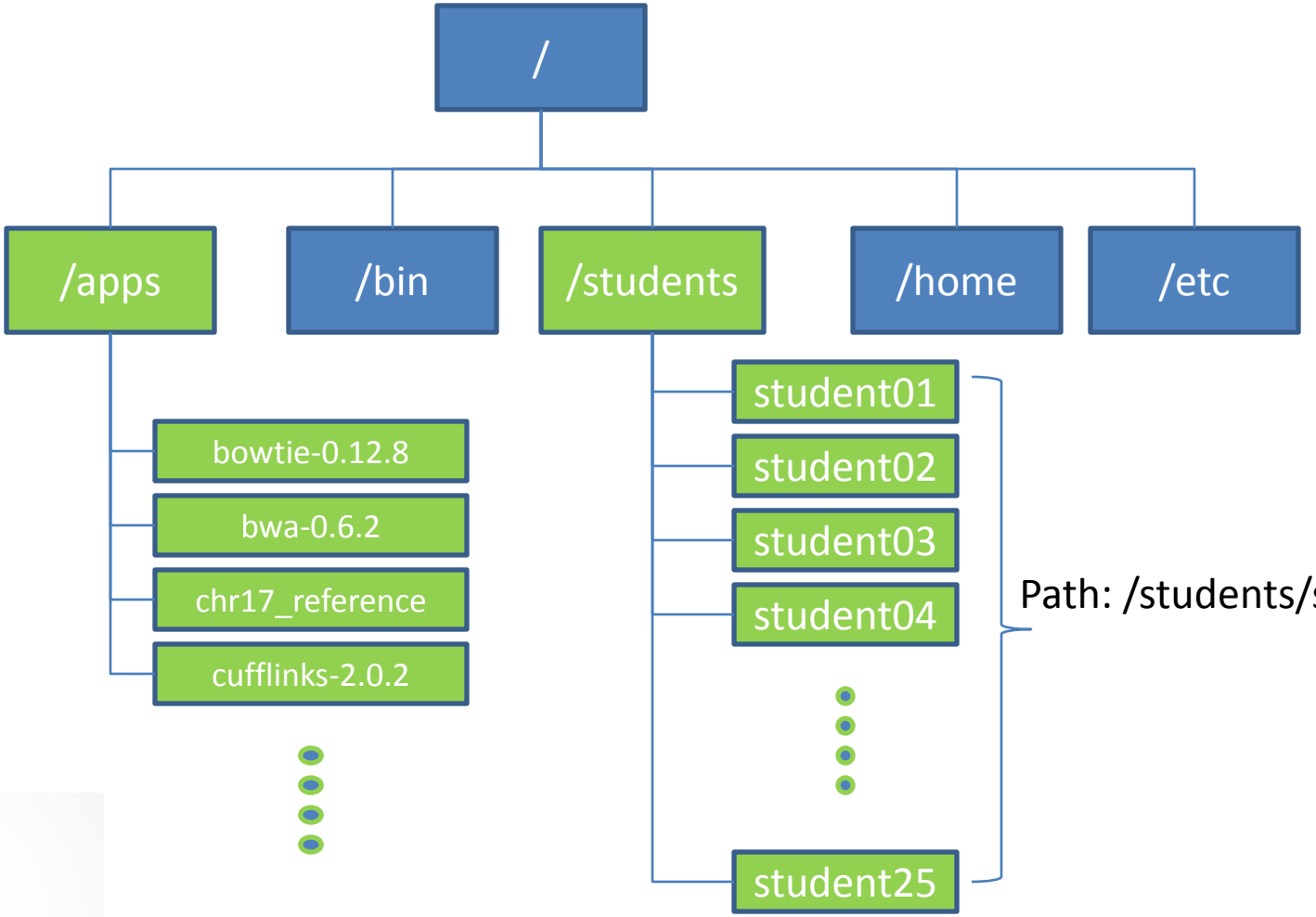
File System Organization



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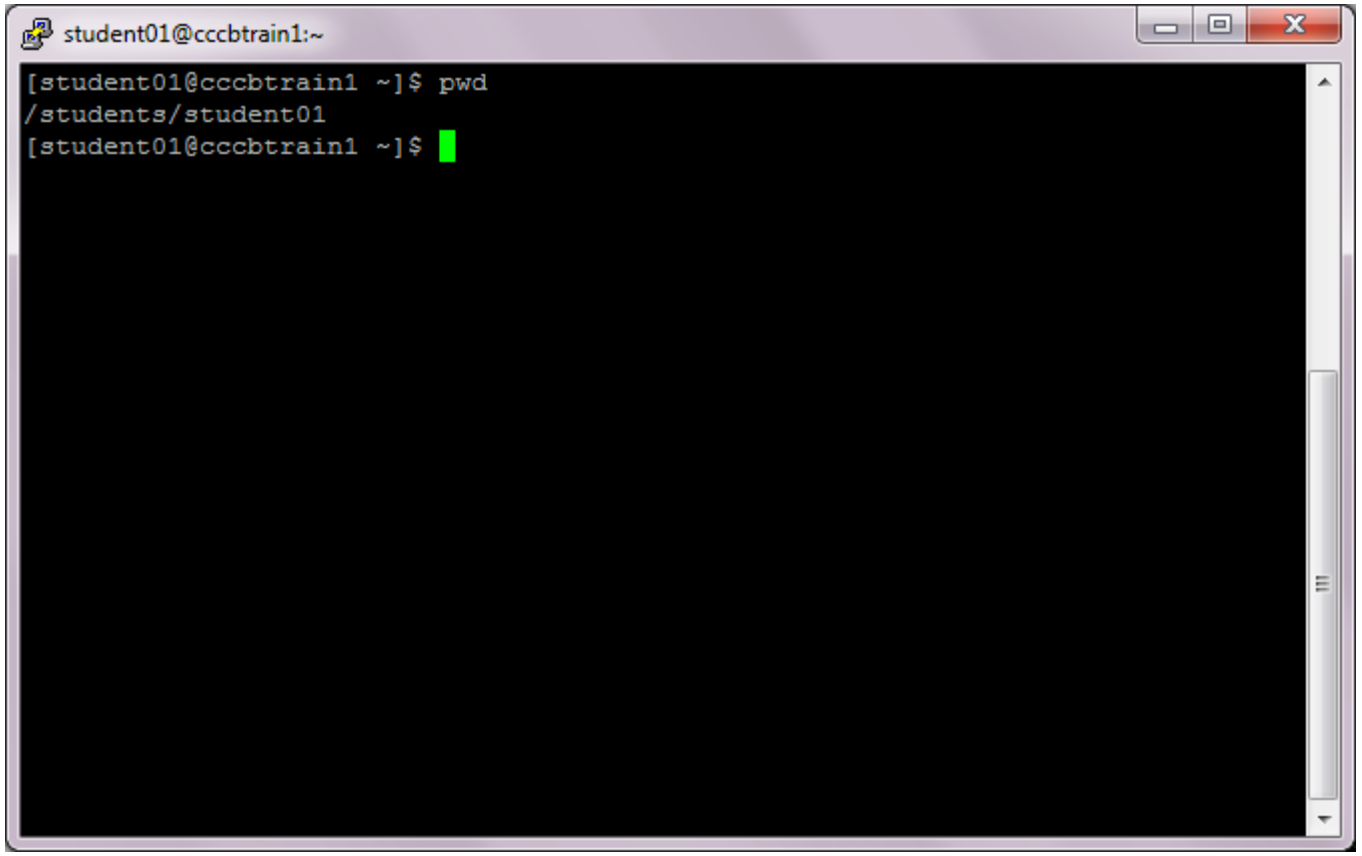
Basic Linux Command



pwd - print name of current/working directory

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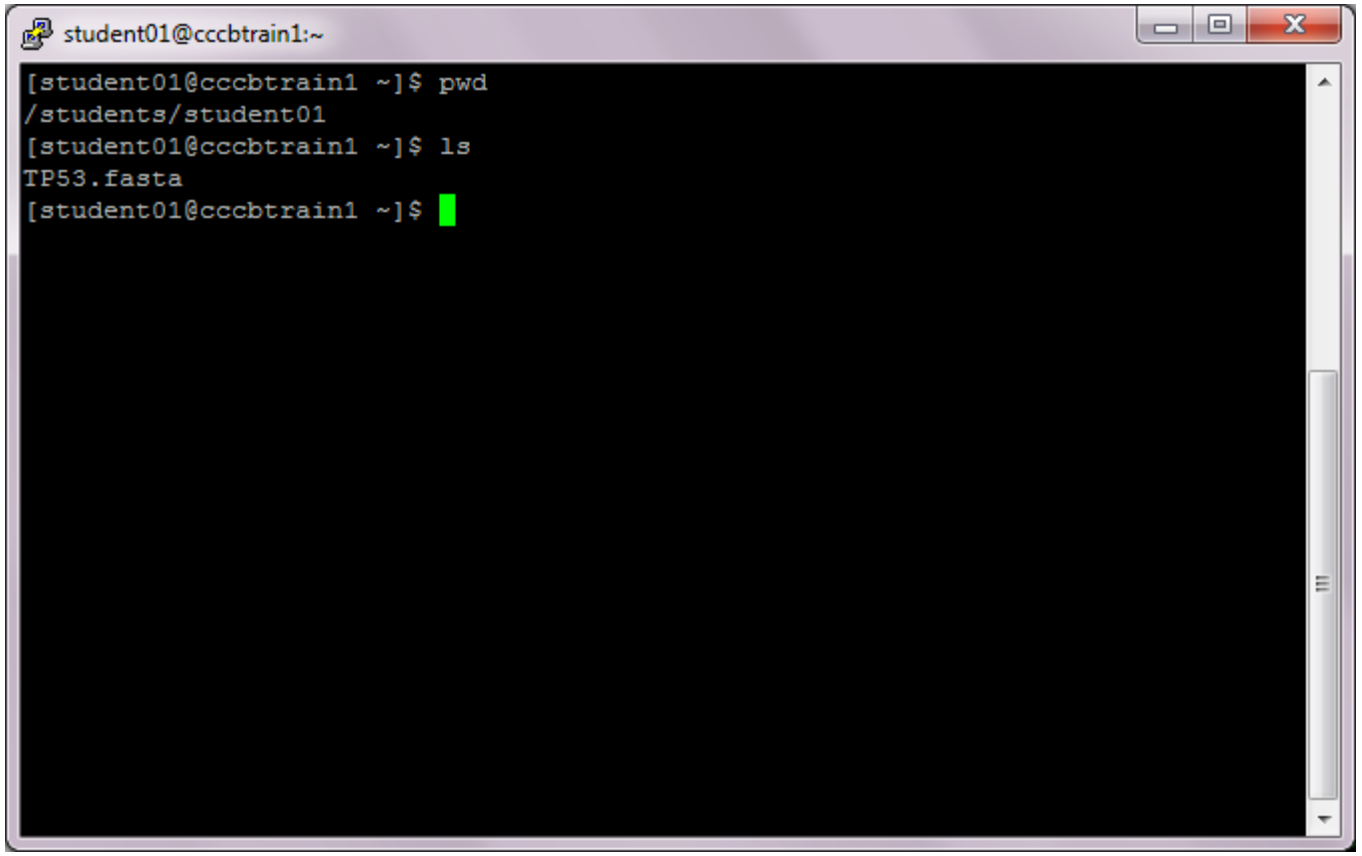
Basic Linux Command



ls - list directory contents

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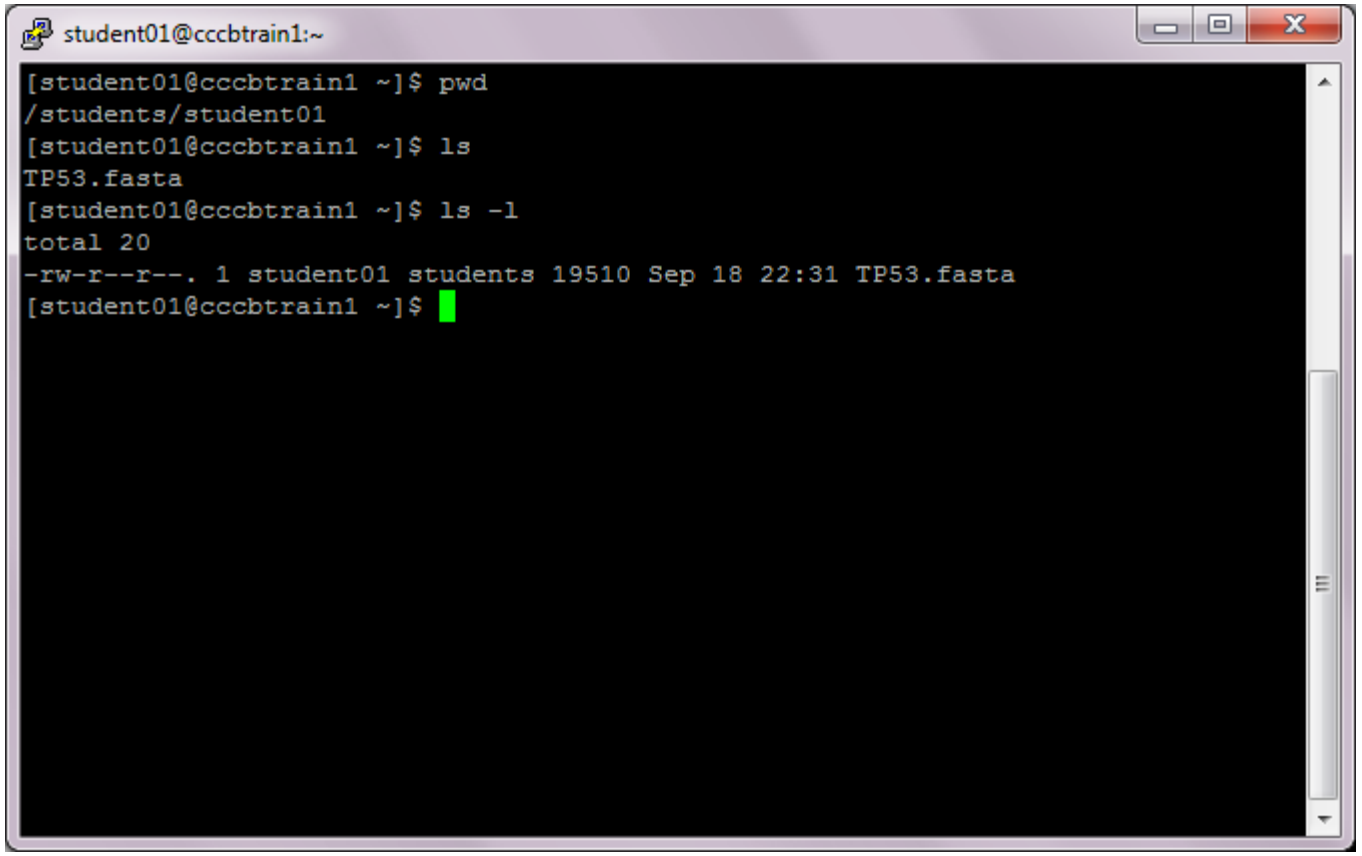
Basic Linux Command



ls –l use a long listing format

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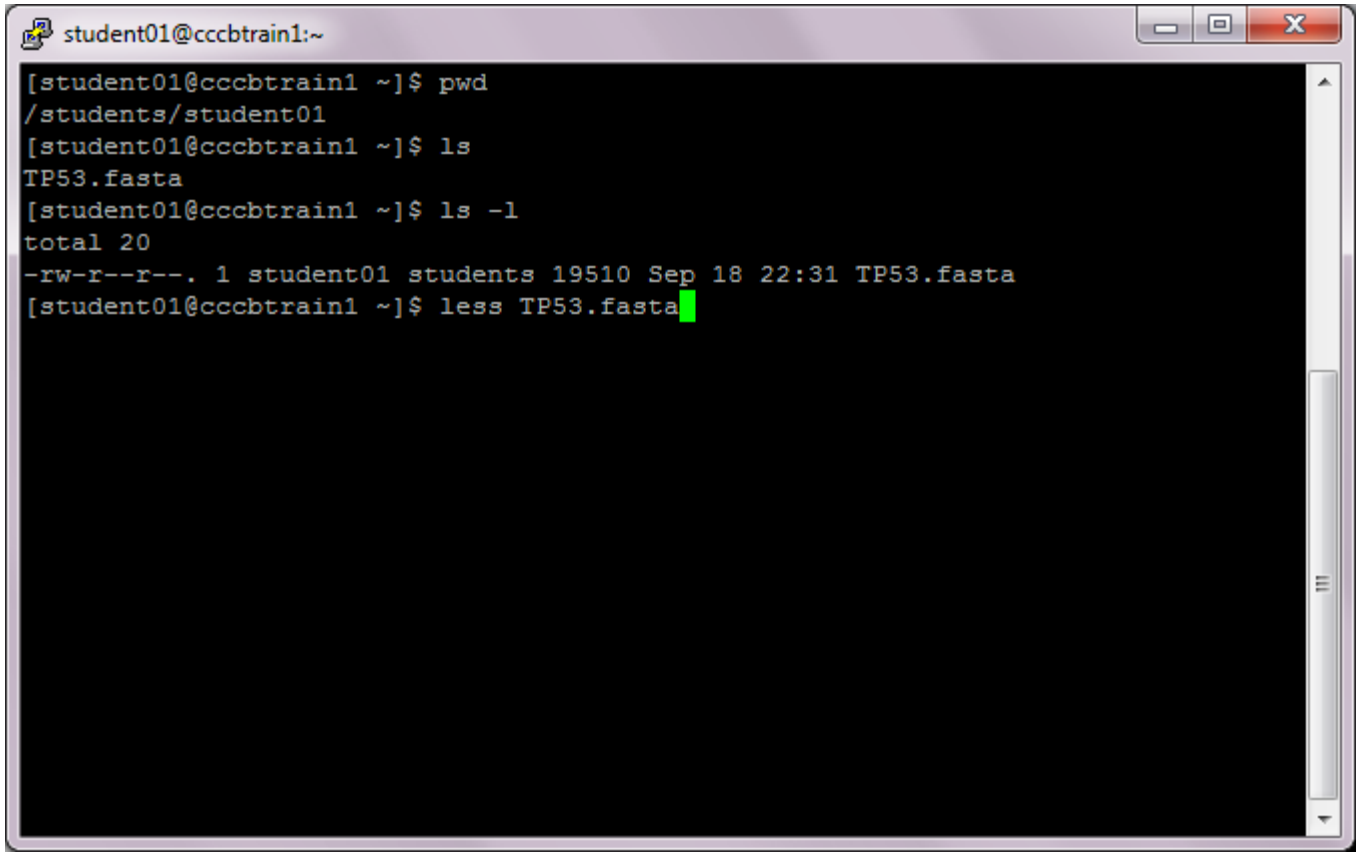
Basic Linux Command



less – quick file viewer

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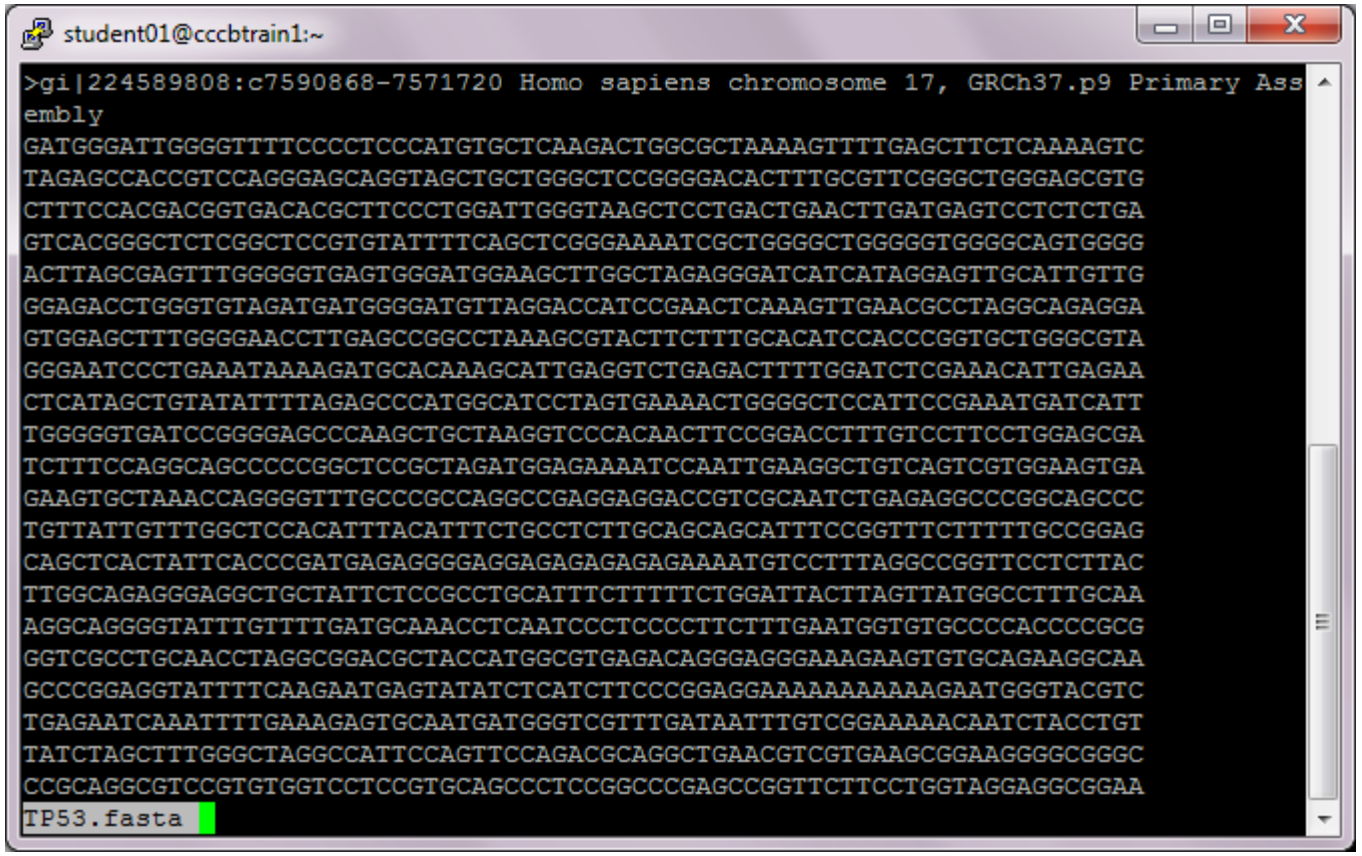
Basic Linux Command



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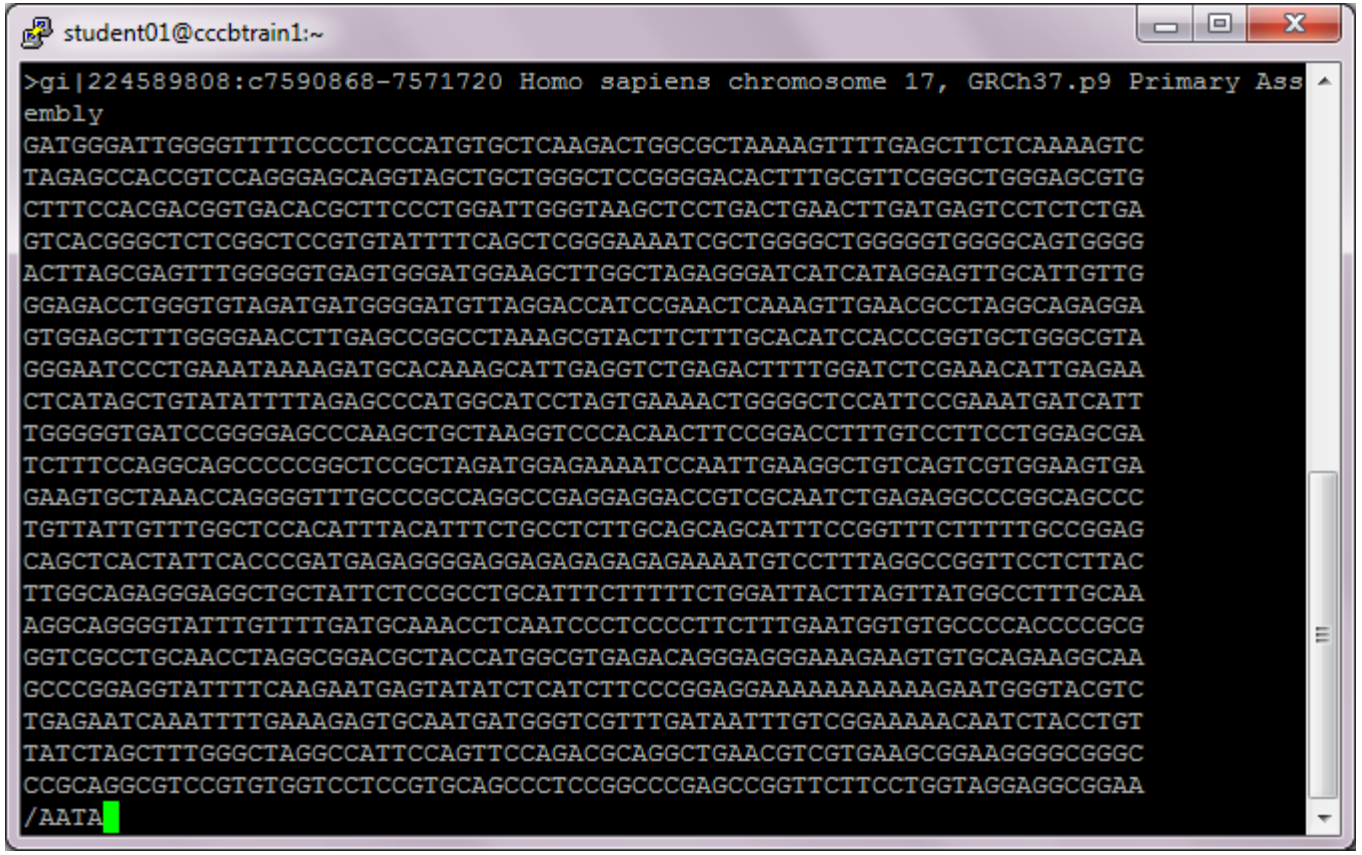
Basic Linux Commands



less – allows for simple text searching

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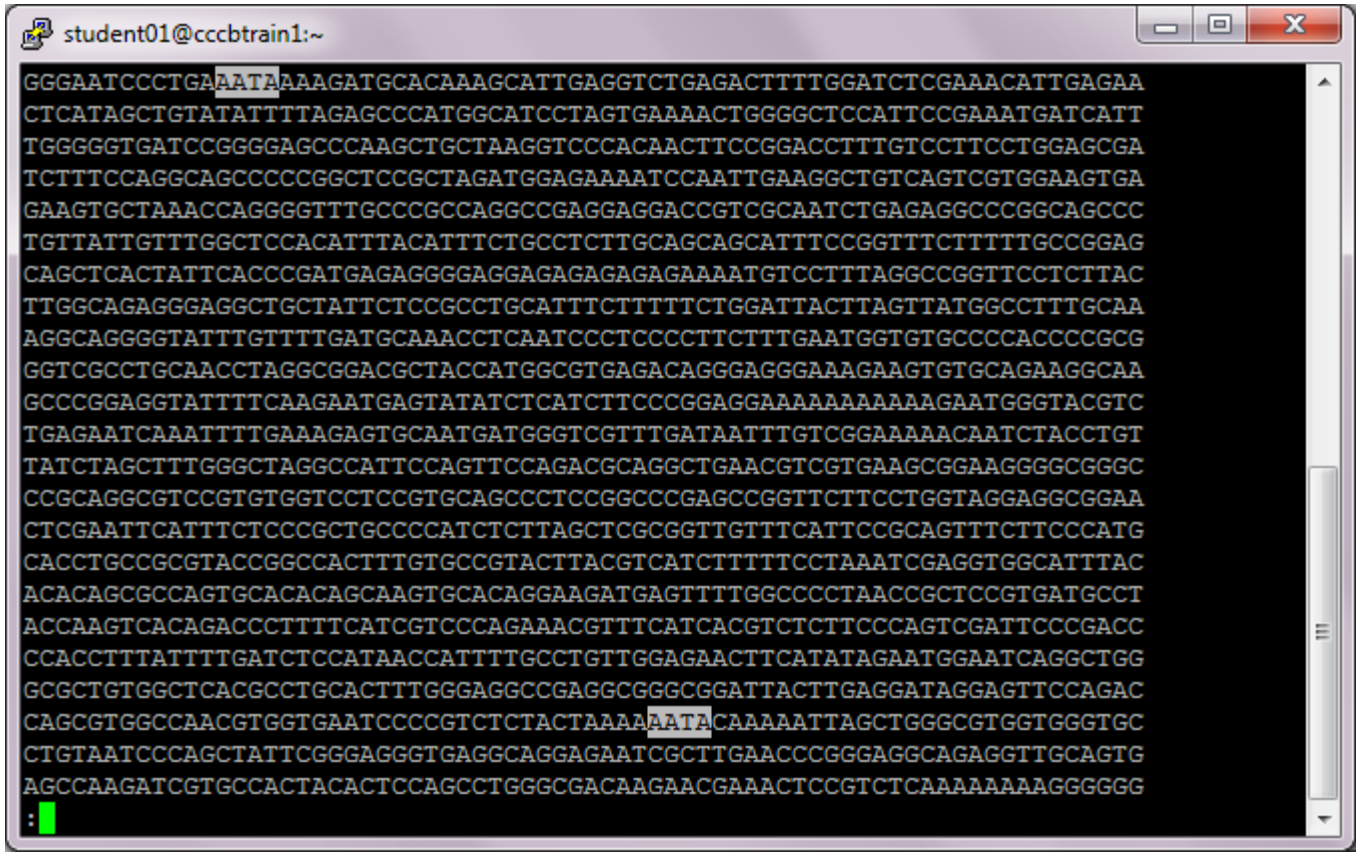
Basic Linux Command



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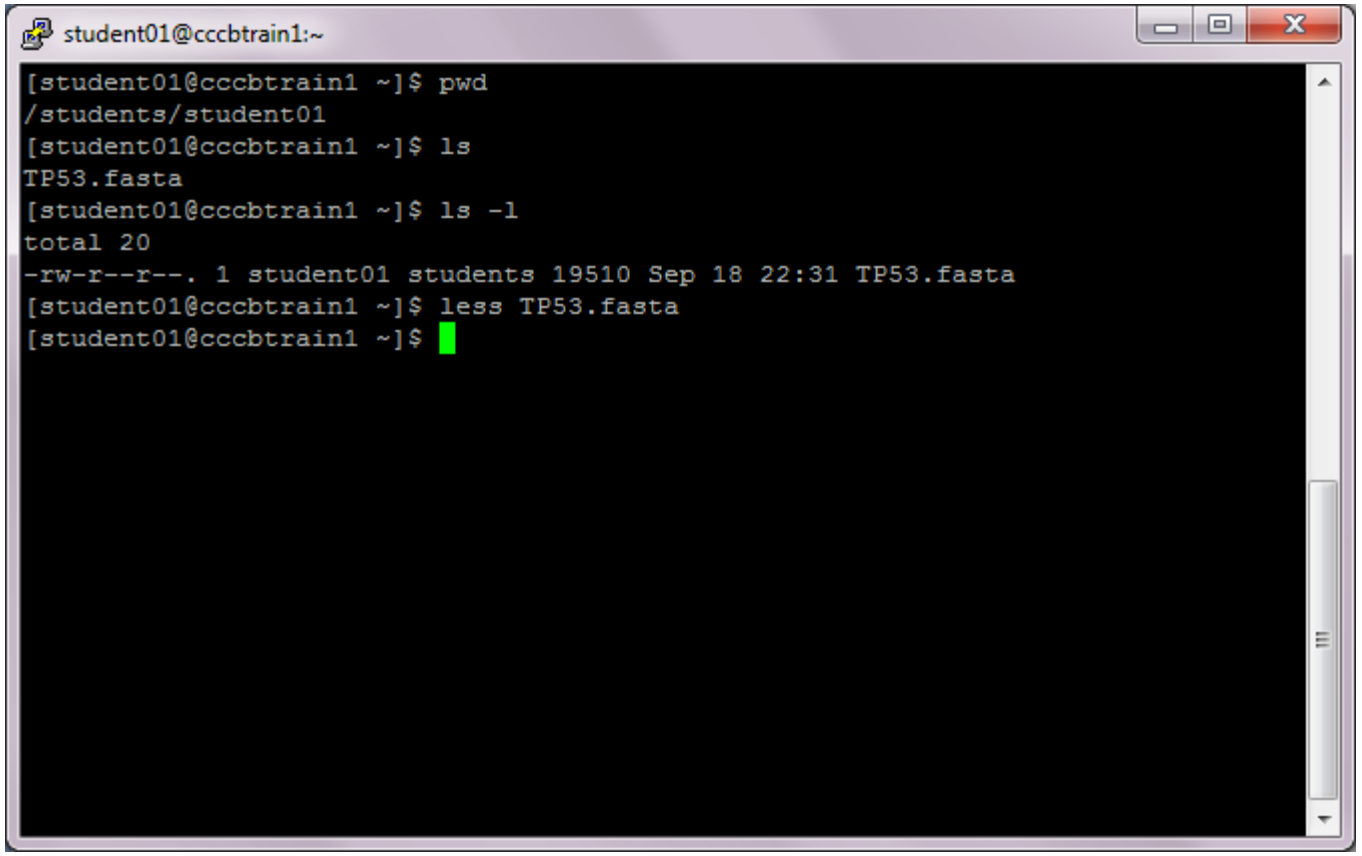

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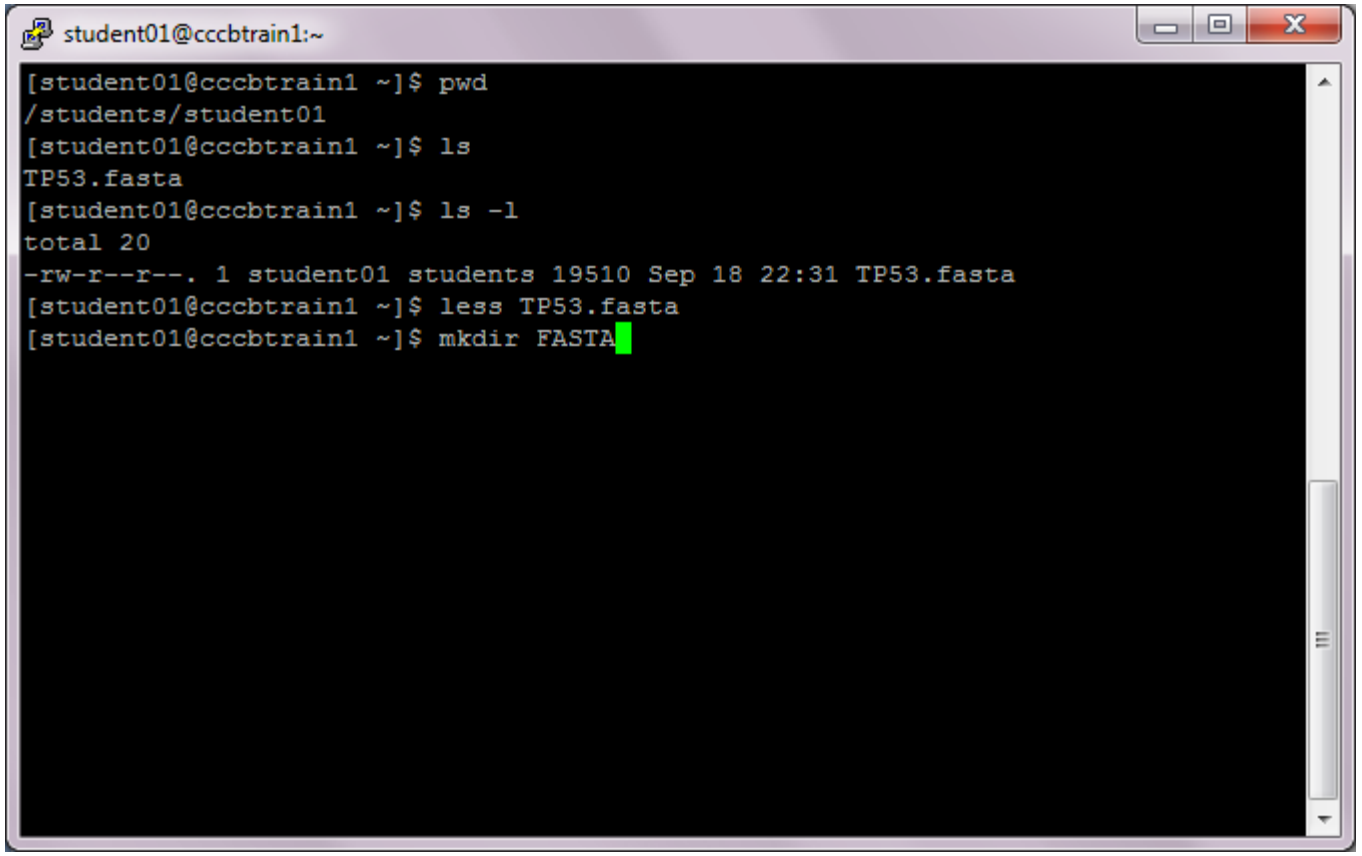

mkdir – make directories

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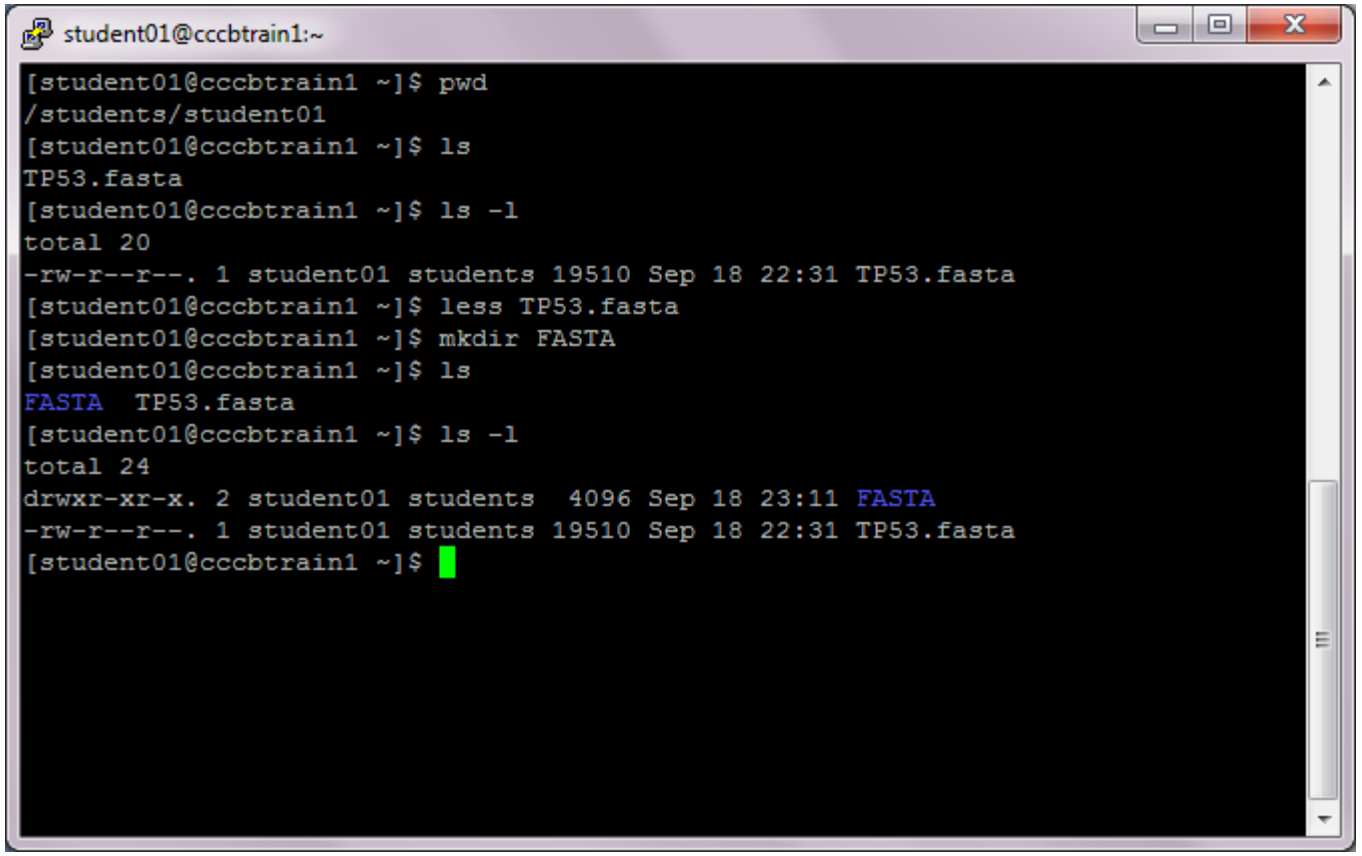

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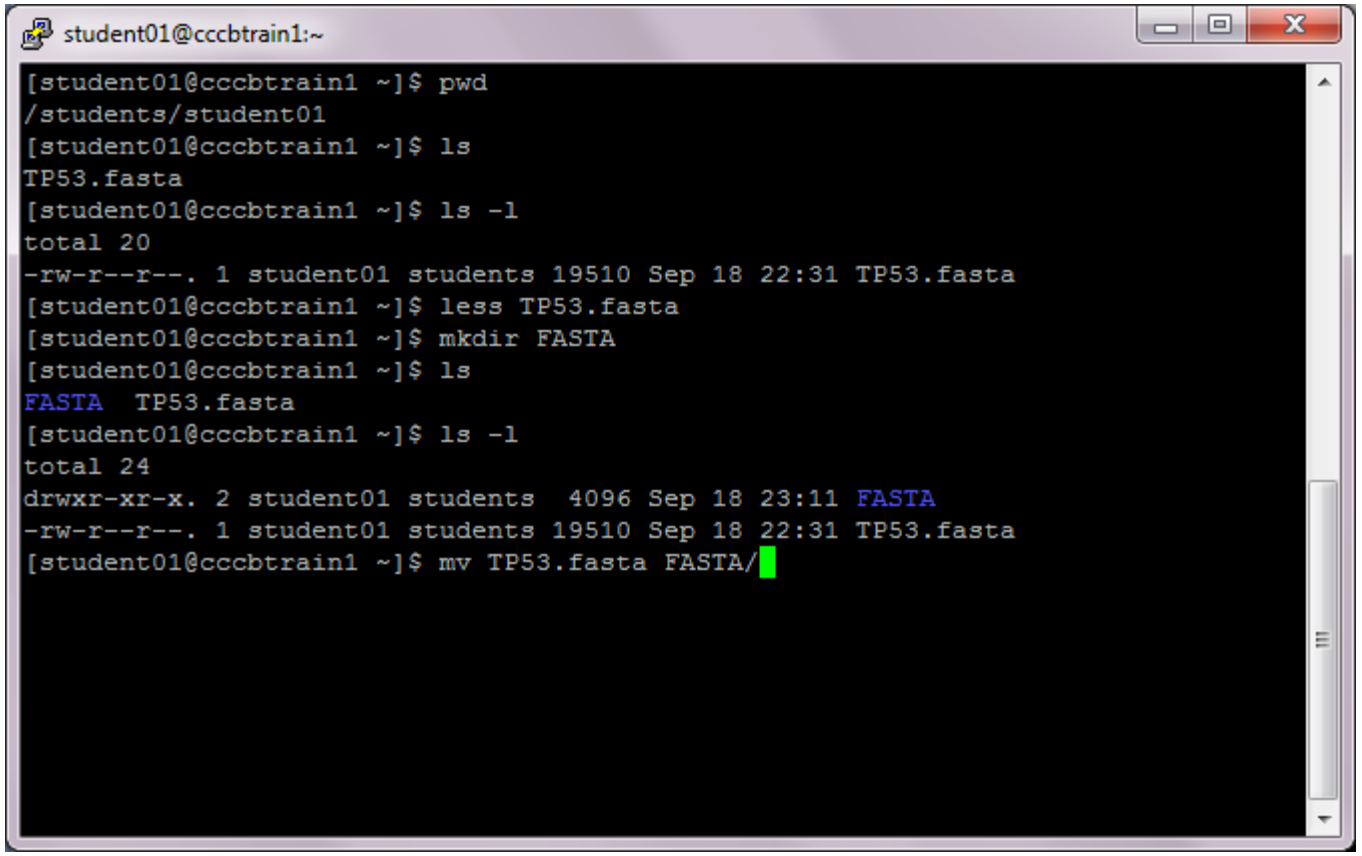

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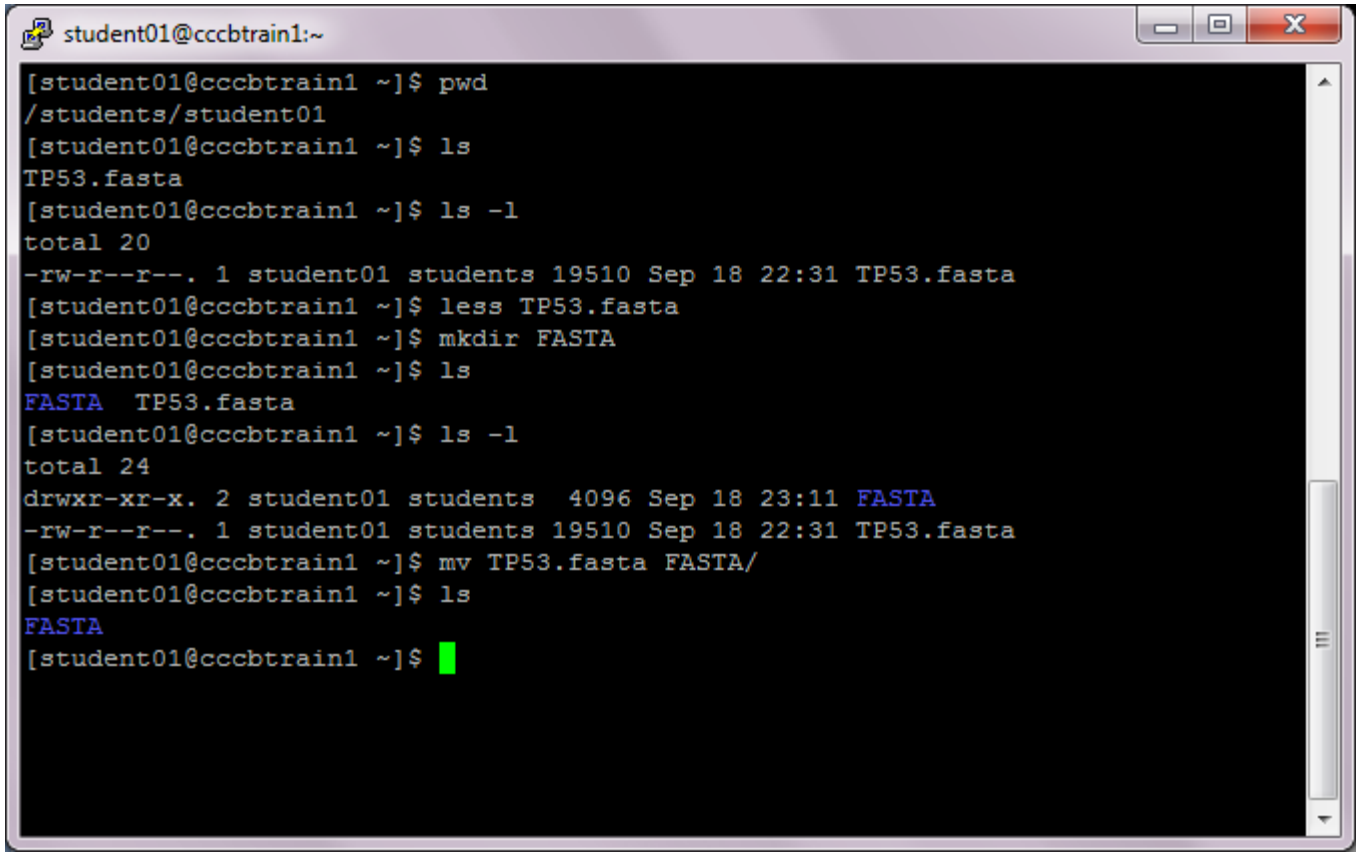

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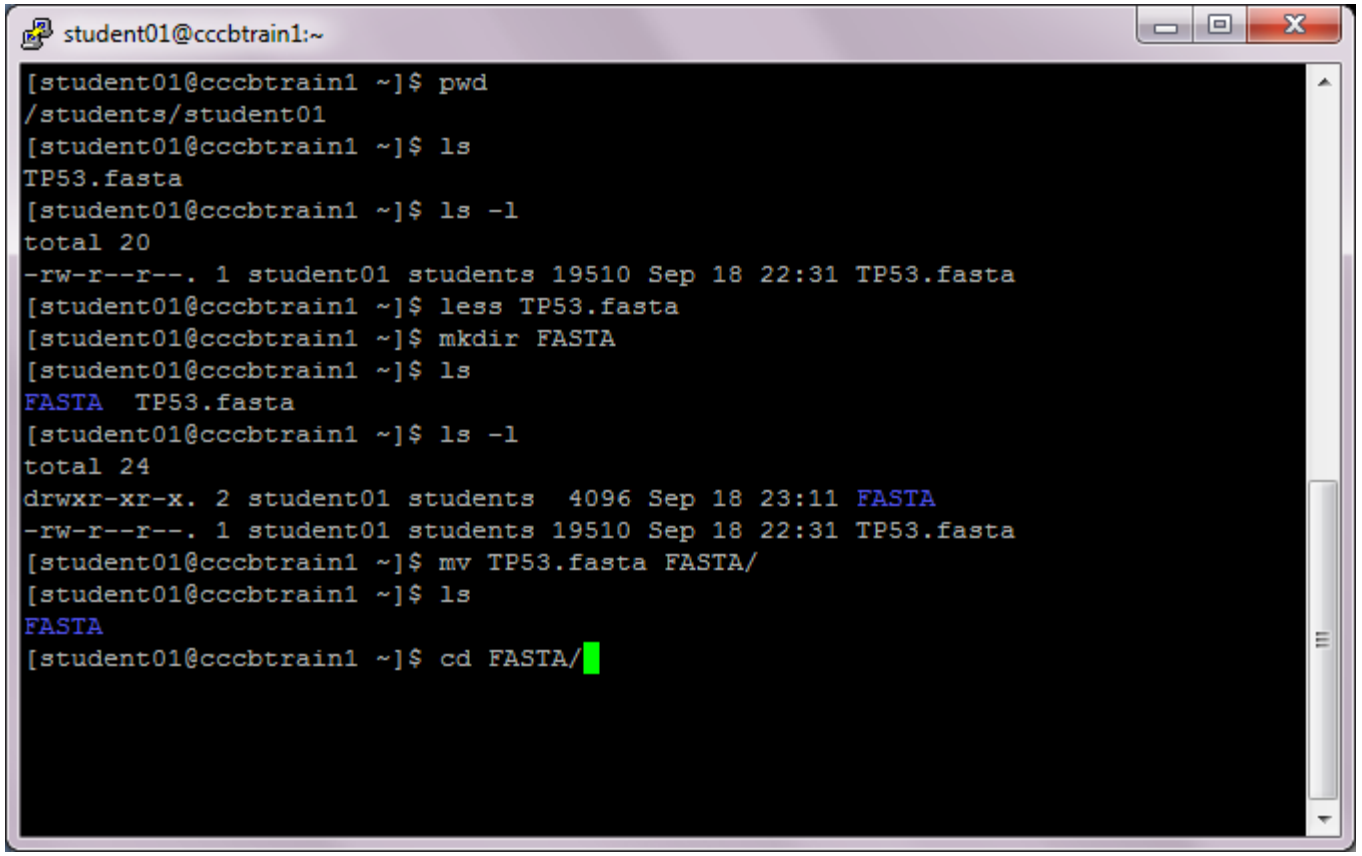

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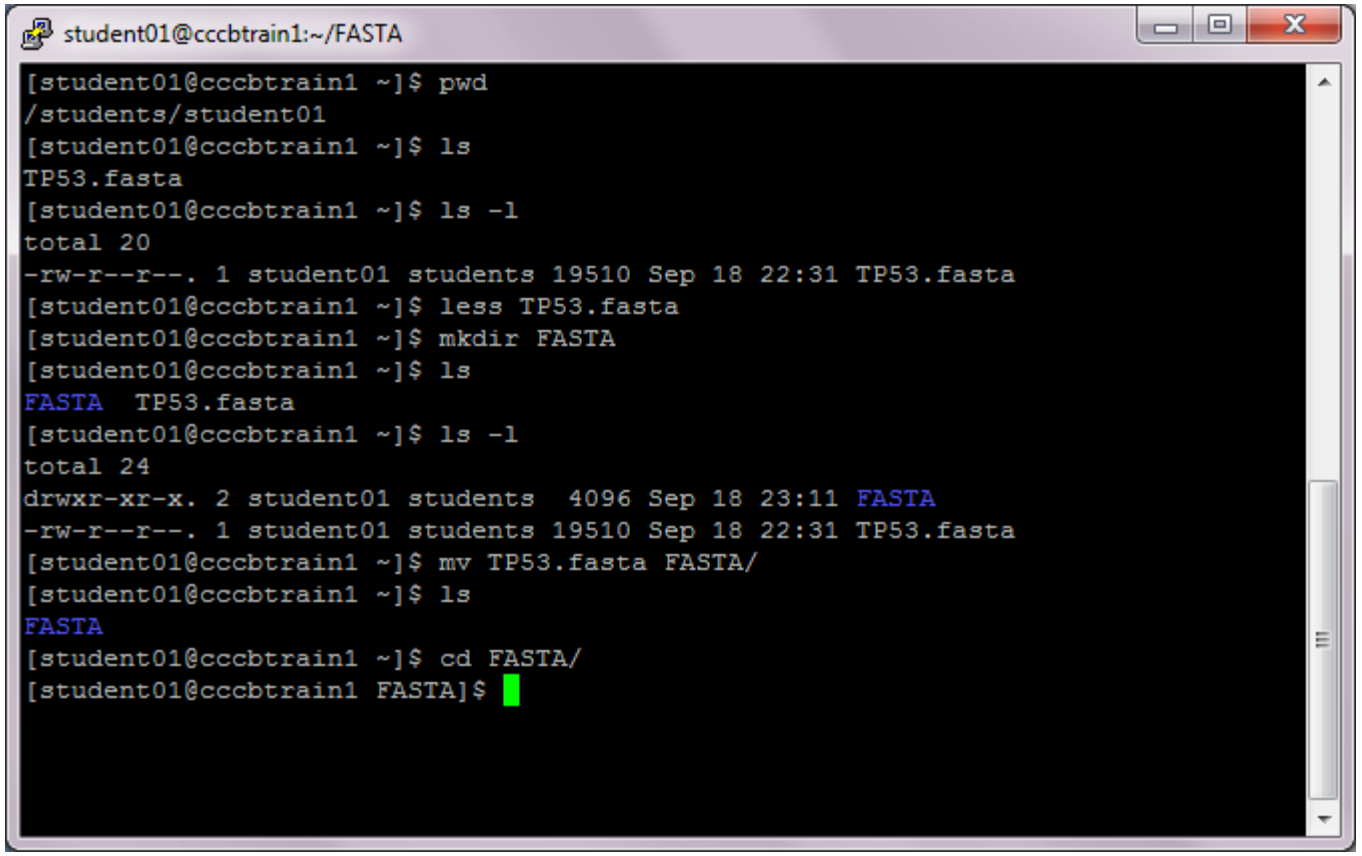

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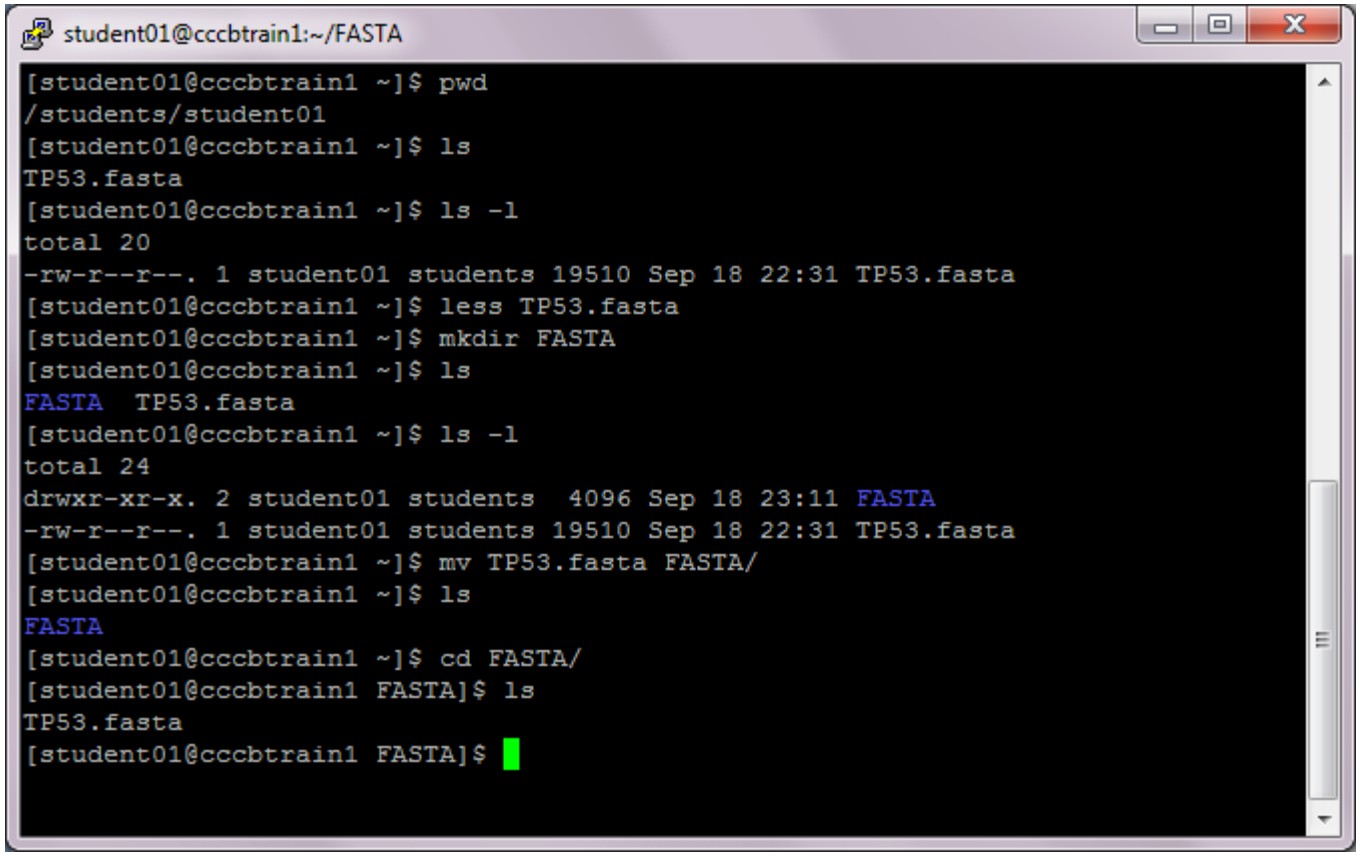

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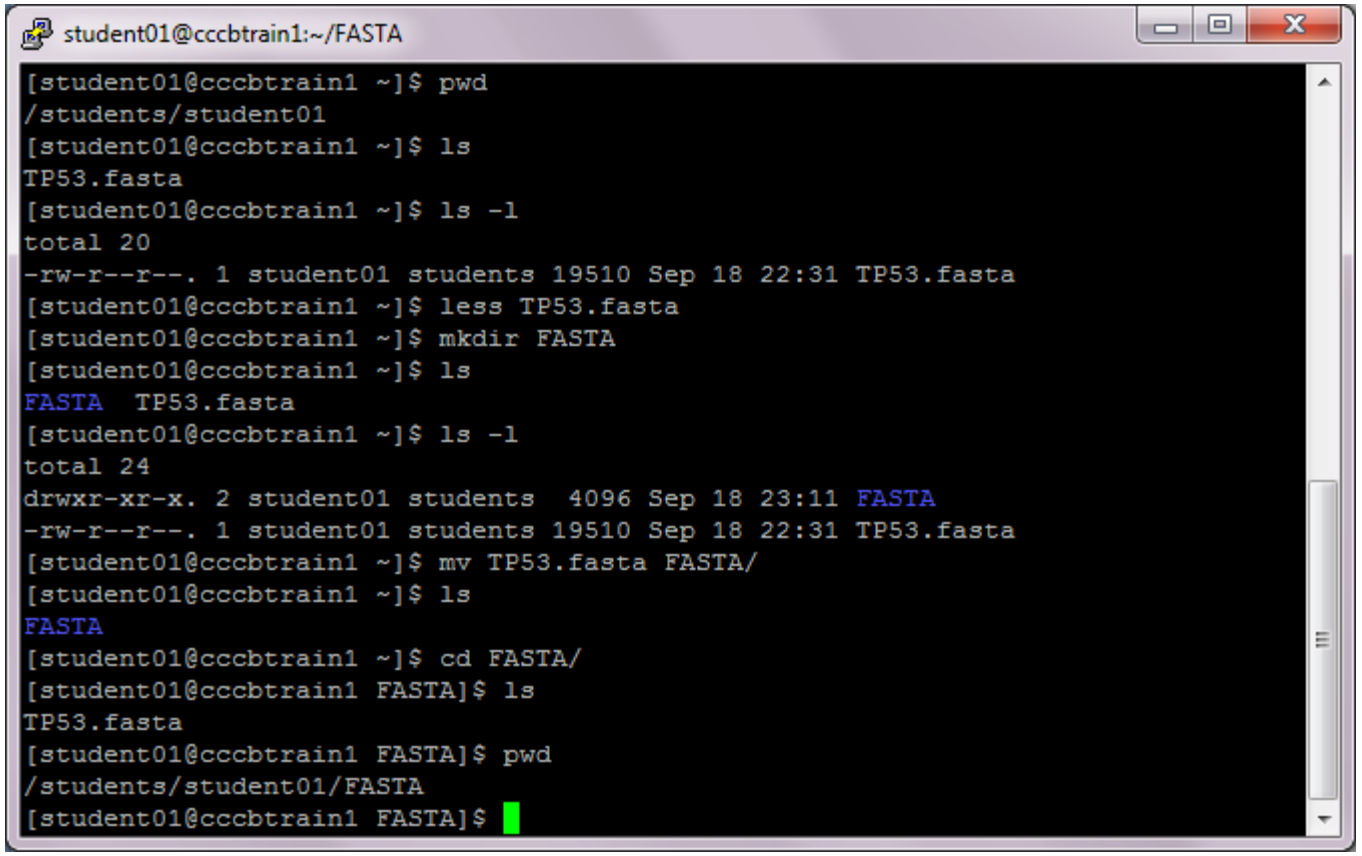

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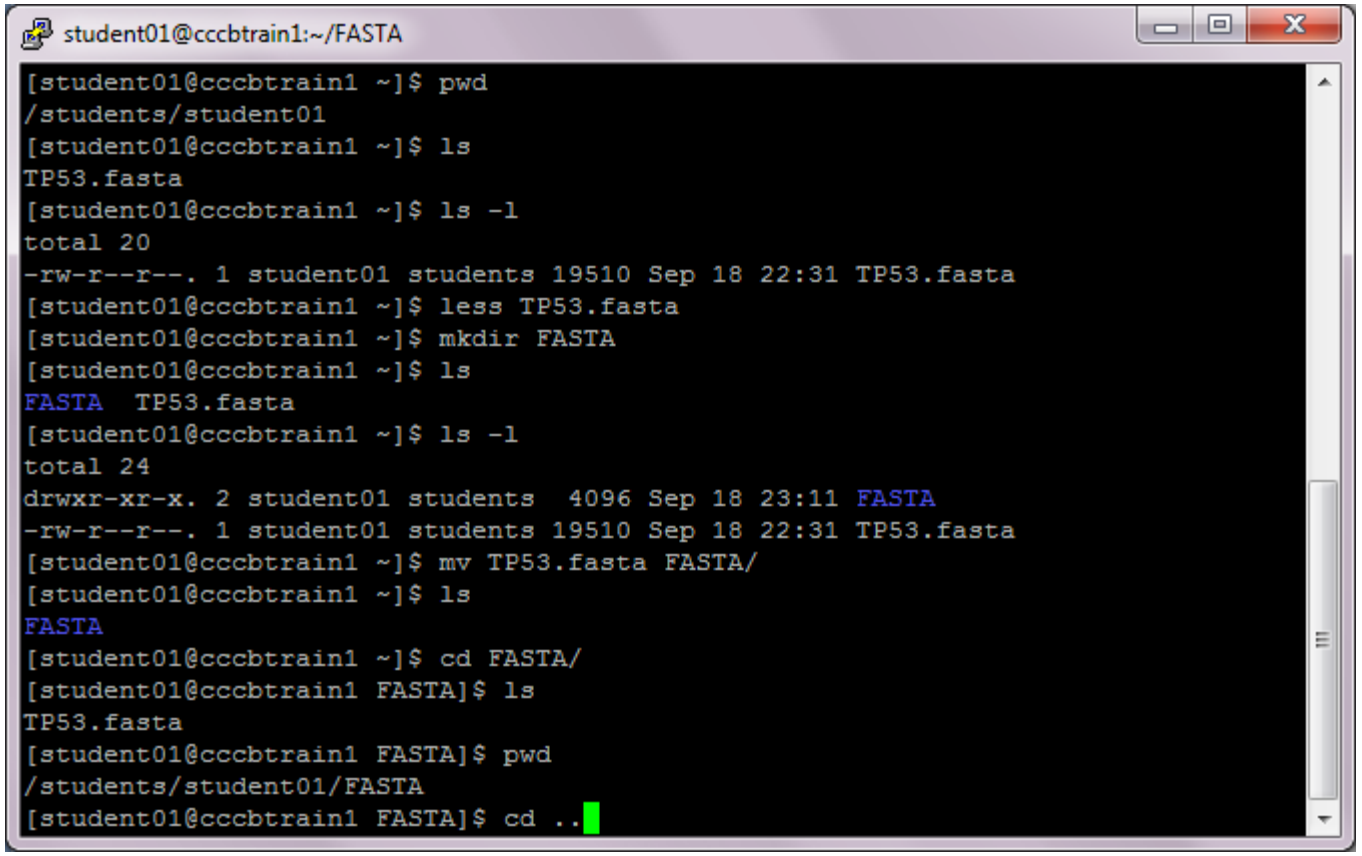

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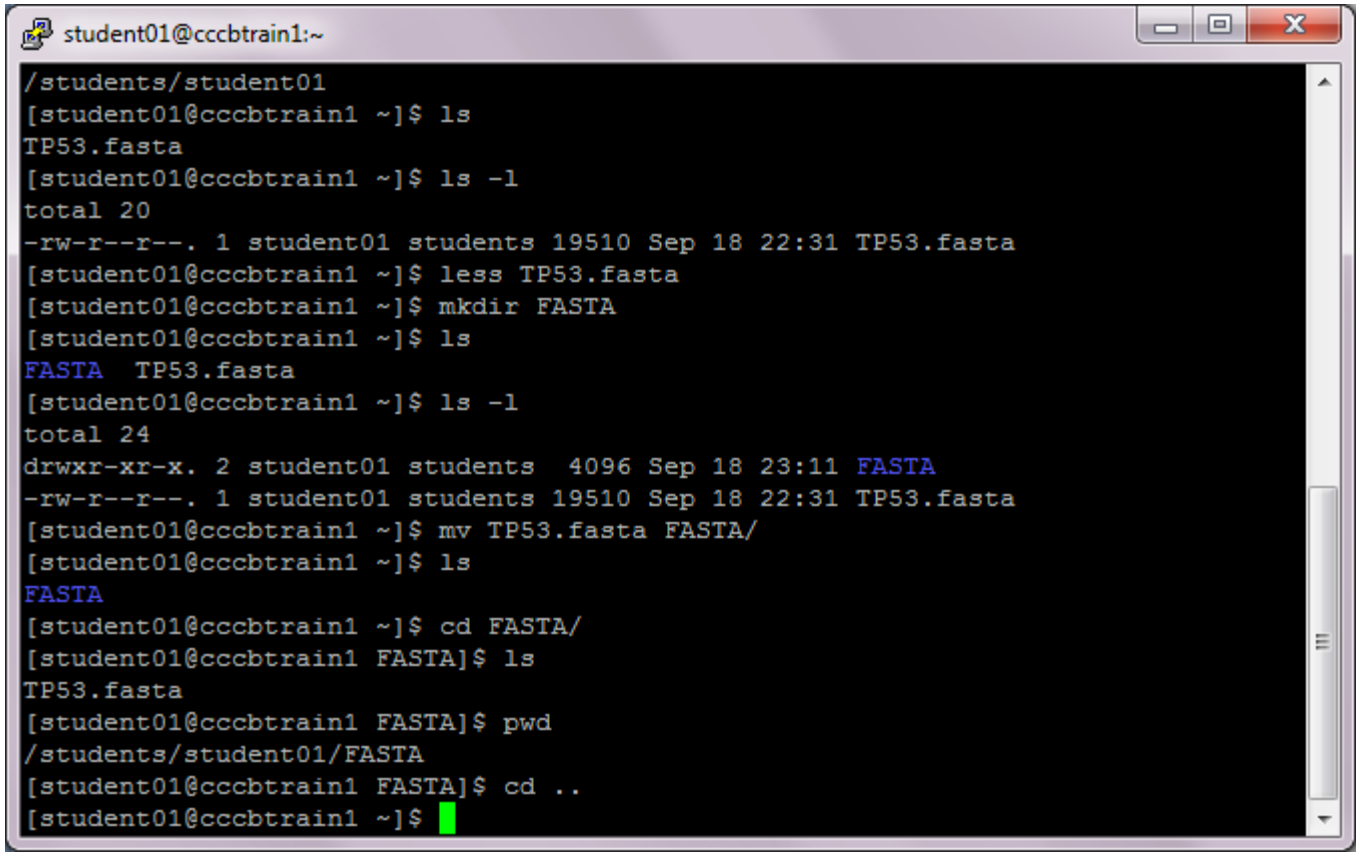

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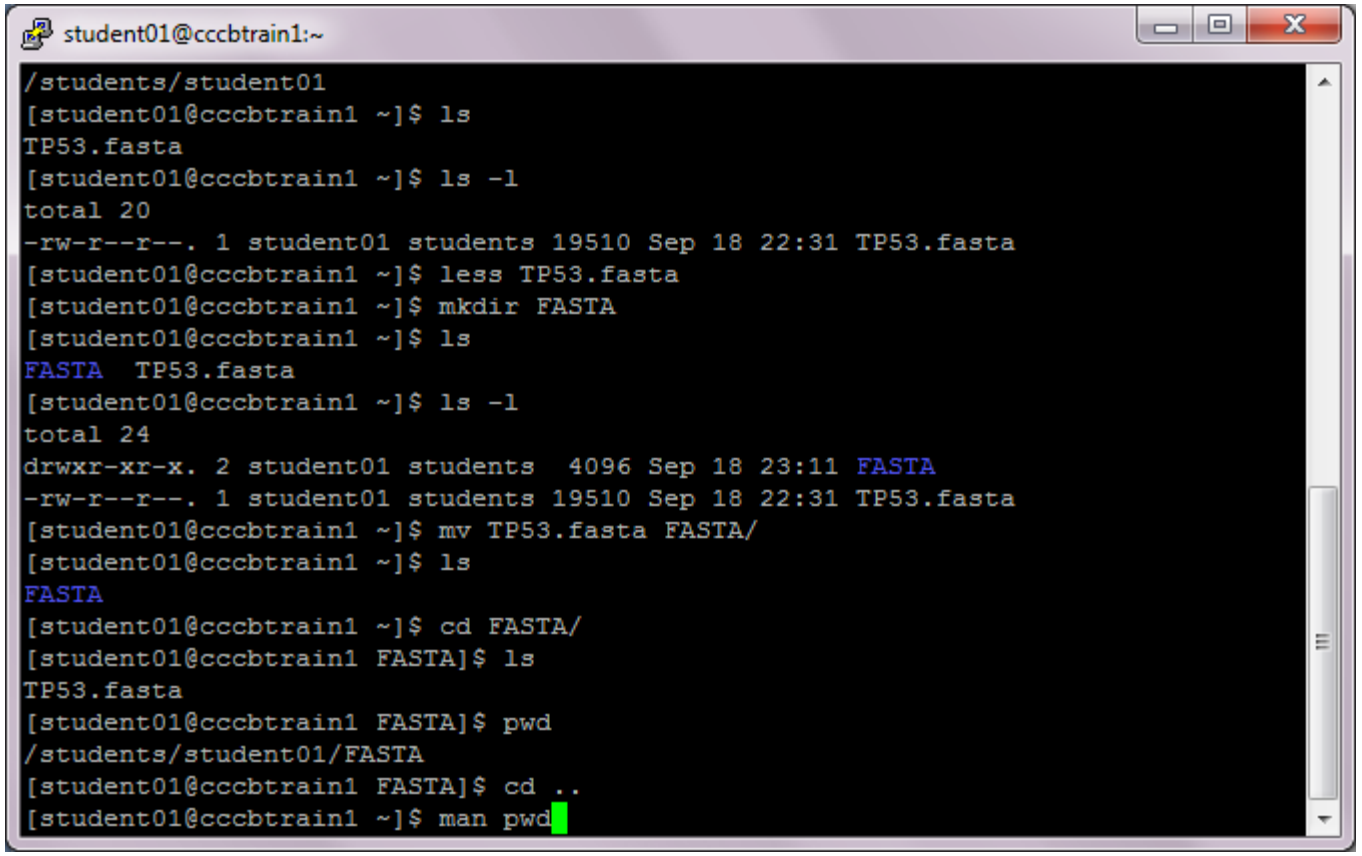

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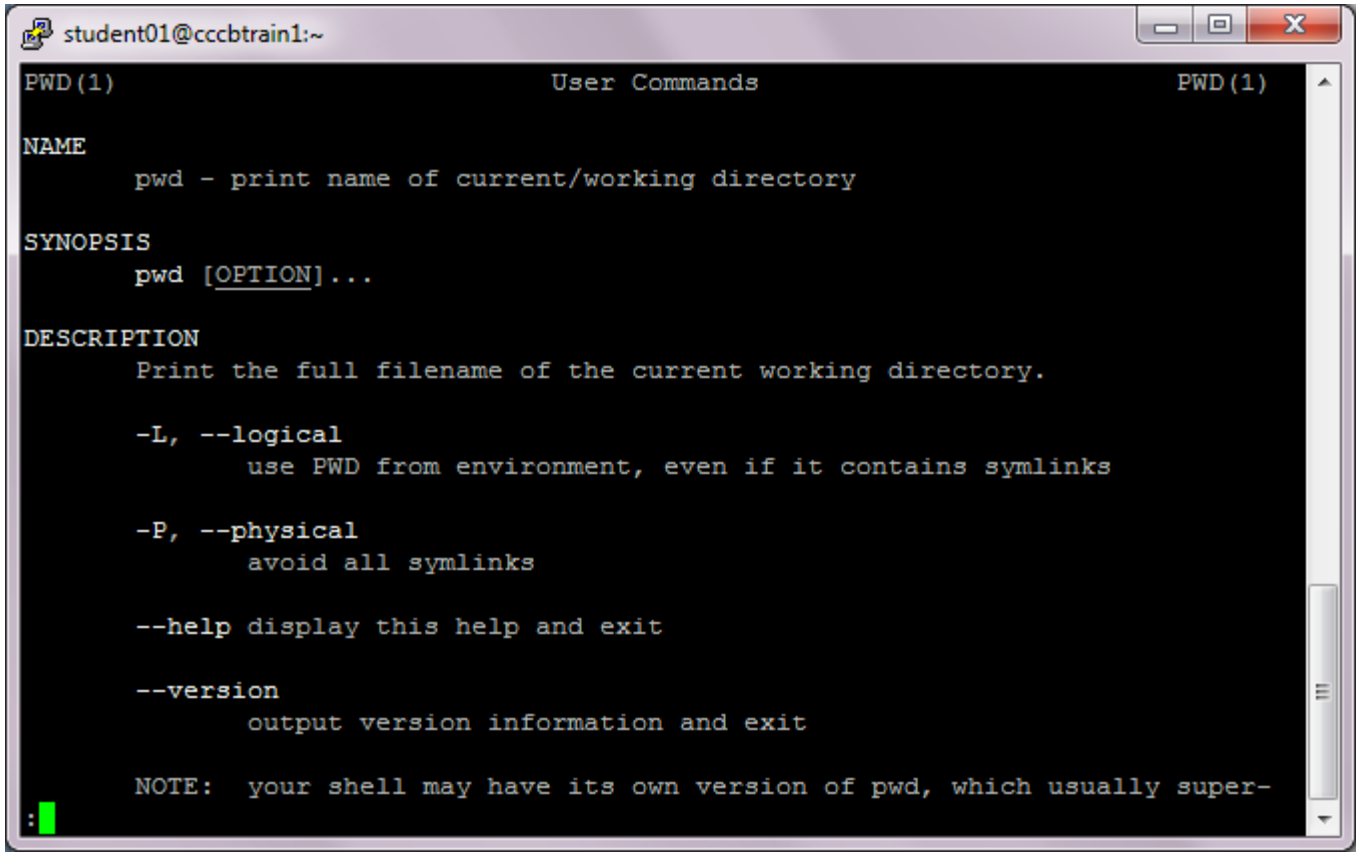

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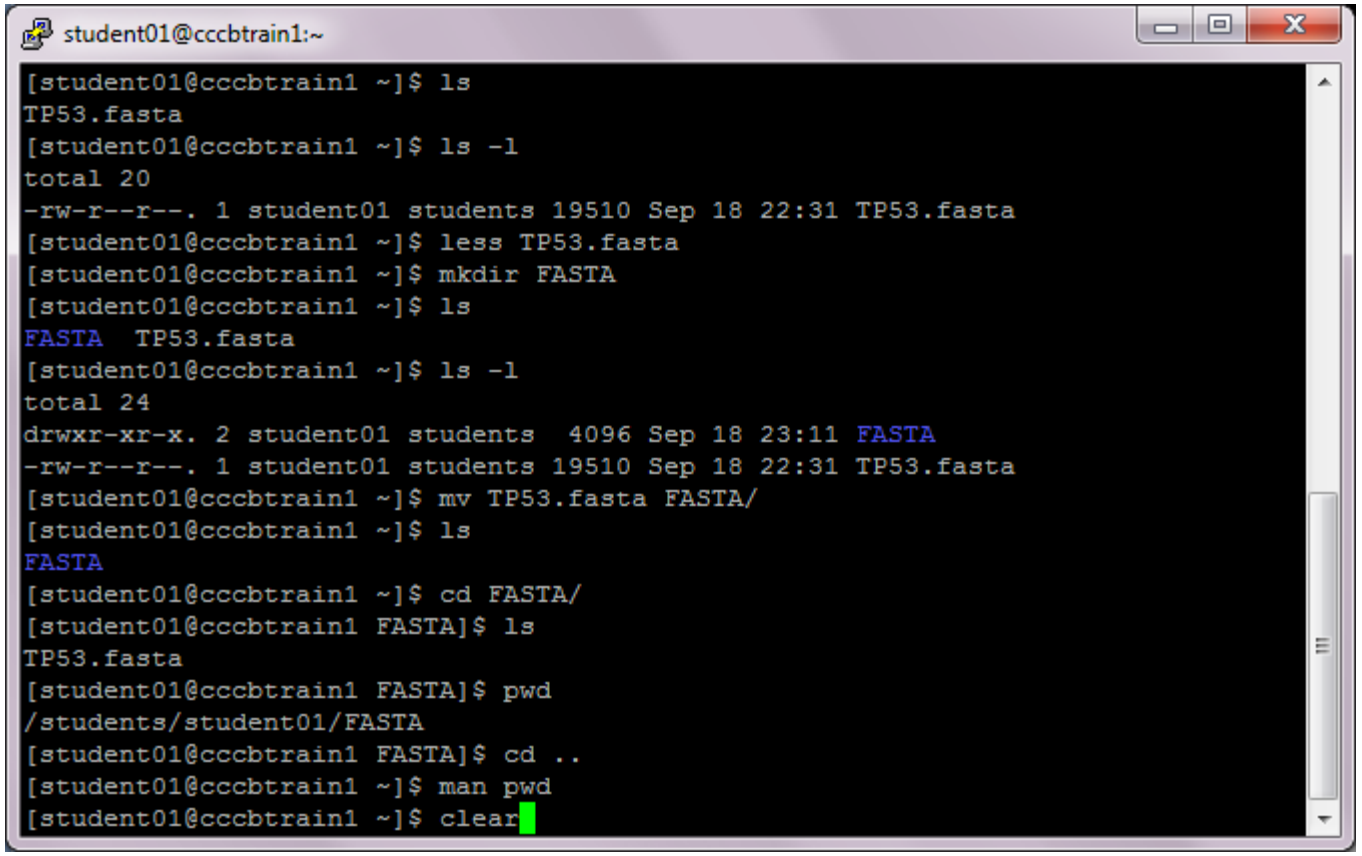

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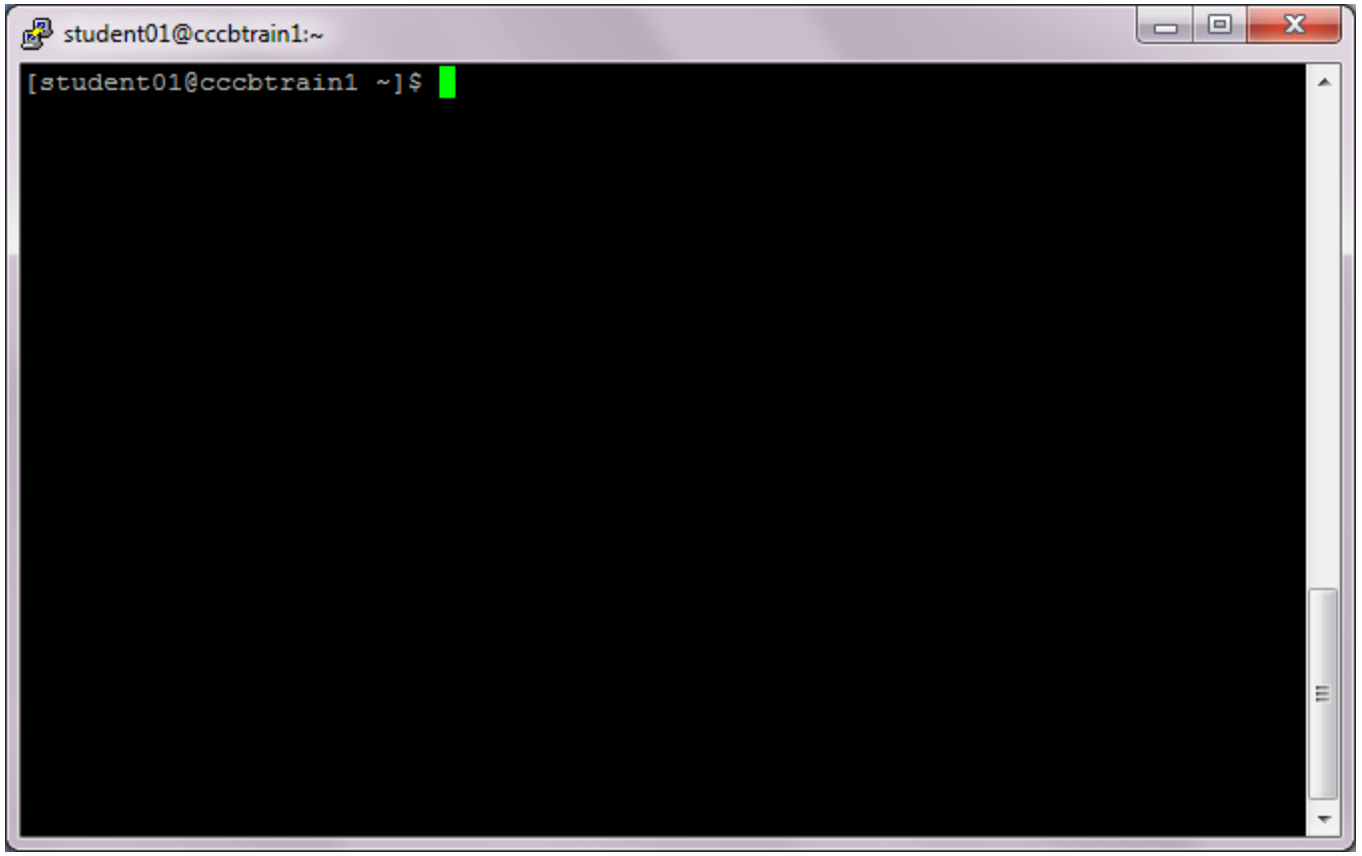
Basic Linux Command



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Cloud Computing

How to get files up and down the Cloud?

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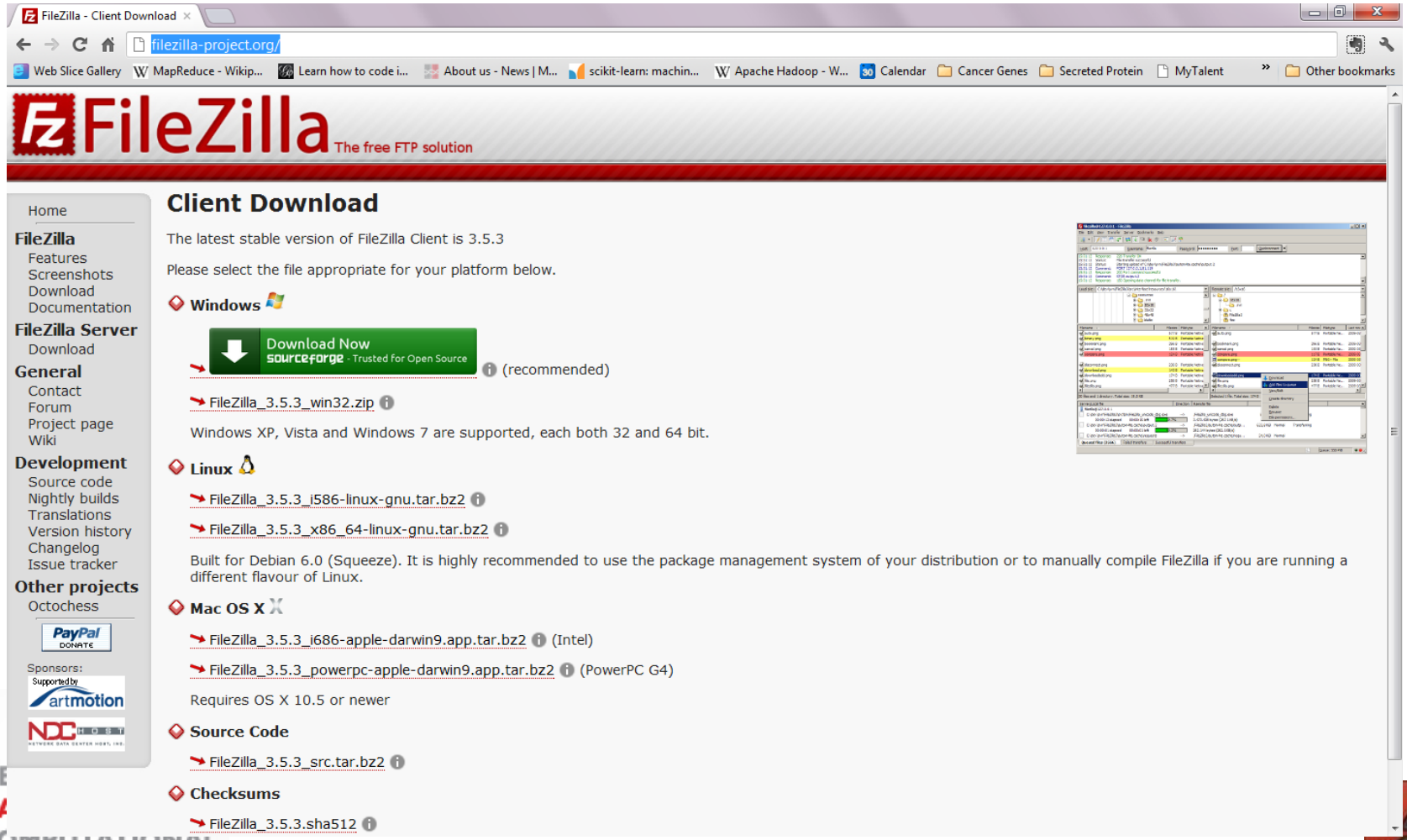
How to get files up and down the Cloud?

Download FileZilla at: http://filezilla-project.org/



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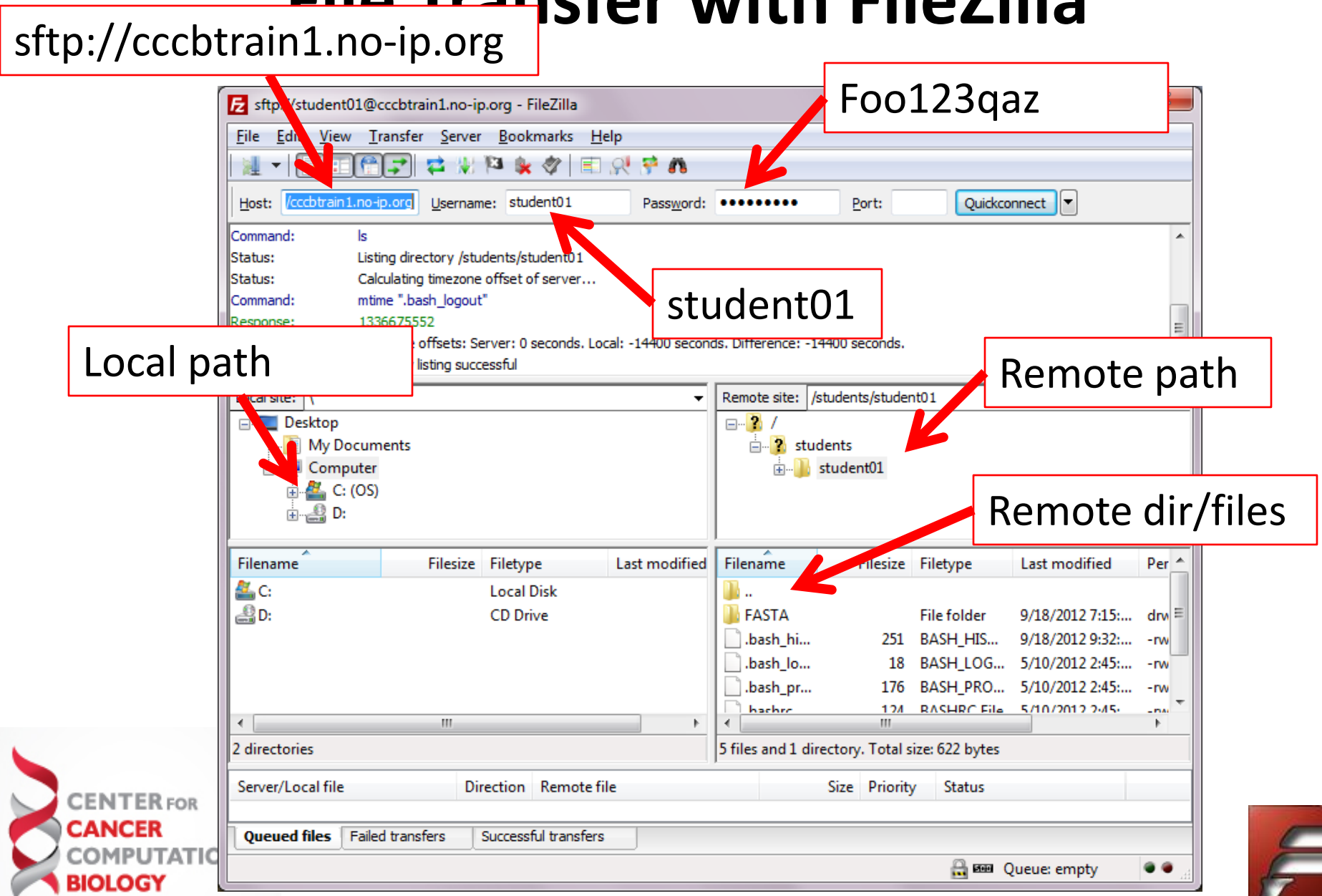
File Transfer with FileZilla



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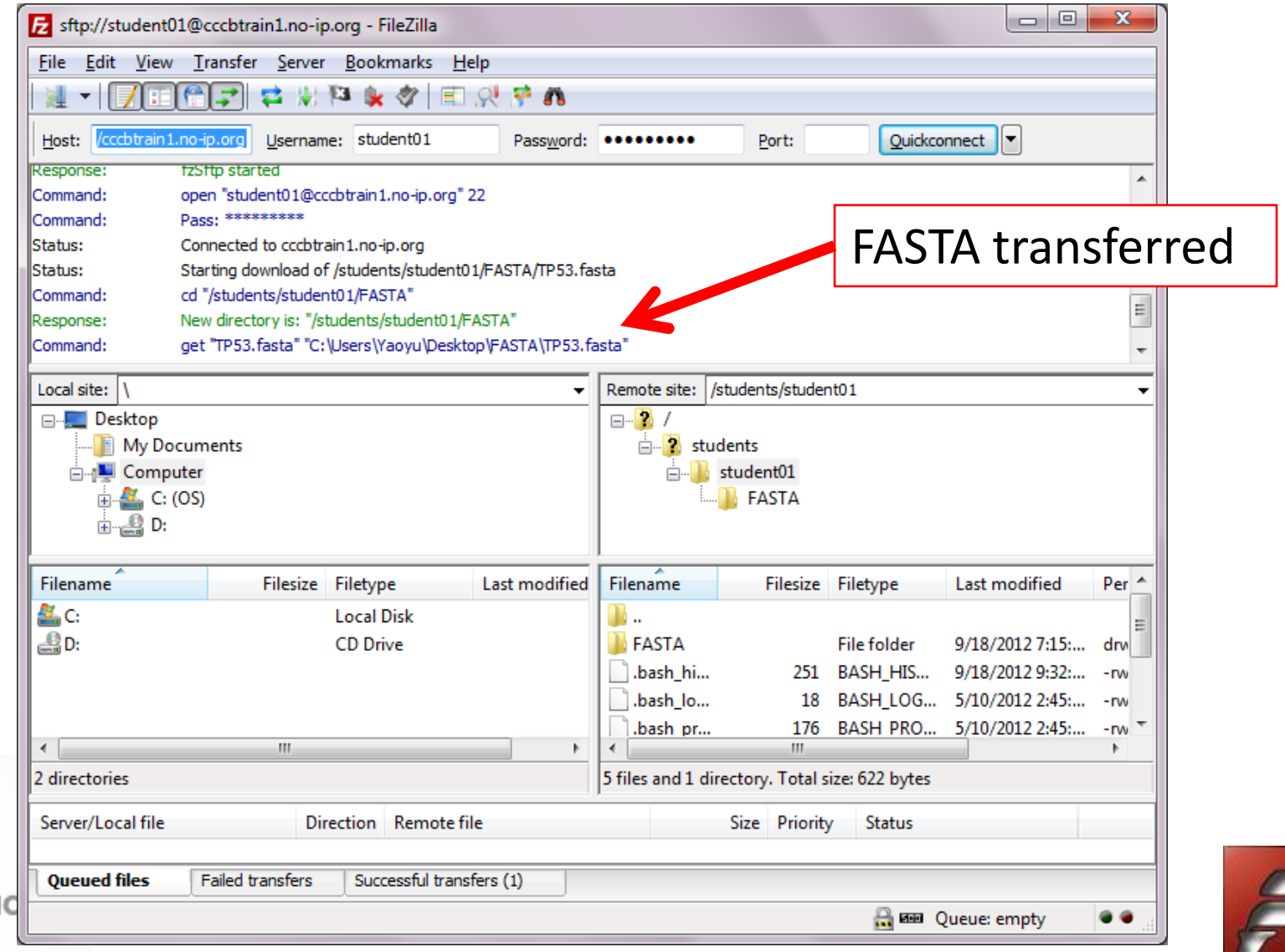

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Session Summary

- Could Computing are remotely hosted computational resources and ubiquitous accessible by internet
- Amazon Web Service (AWS) and Elastic Compute Cloud (EC2) provides cloud computing service and storage by demand
- Linux-based Cloud servers can be accessed through SSH (Secure SHell) by PuTTy
- Files can be transferred up and down the Cloud Server by SFTP using programs such as FileZilla

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Download R at:
/apps/R-installation

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