

Intro to Unix/Command Line

BIOL 435/535: Bioinformatics

March 10, 2022

Using the command line

Mac
Terminal

PC
Command Terminal
(non-UNIX)
PuTTY

ChromeOS
Secure
Shell

Unix basic commands

command -options standard_input > standard_output

standard_error will print to the screen

Unix basic commands (and Google is your friend)

cd – change directory (**cd ~ = ET Go Home**)

ls – lists files inside a directory (**ls -l**)

pwd – print working directory

cp – copies a file from one place to another

mv – moves a file from one place to another (including renaming)

rm – removes a file/directory (-r option required for removing a directory **BE VERY CAREFUL!!**)

mkdir – make a new directory (aka folder)

echo – print to the terminal

head – shows the top part of a file

tail – shows the bottom of a file

wc -l – List the number of lines in a file

cat – print the ENTIRE file's contents

wget – retrieve a file from a url

watch – watch a command in action, updates every 2 seconds

ssh – open a secure shell (encrypted connection between two computers)

screen – open a virtual ssh session – **won't get disconnected!**

scp – secure copy protocol (encrypted file transfer)

ftp – file transfer protocol (unencrypted file transfer)

more – read a file, little-by-little

chmod – modify file/folder permissions

unzip – unzip a compressed zip file

gzip – compress a file

gunzip – unzip a .gz file

tar – make/unpack a tarball

du -h – List your disk usage

diff – Compare two files, line by line

env – Print current environmental variables to the screen

vi/vim – text editor **BE VERY CAREFUL!!**

nano – text editor **BE VERY CAREFUL!!**

emacs – Text editor **BE VERY CAREFUL!!**

SSH (secure shell)

```
ssh username@server
```

[Need a VPN to logon to Discovery HPC](#)

Some additional considerations

`./bash_rc` file controls your environment

Object-oriented programming, and variable assignment

- `$HOME`
- `$USER`
- `$PATH`

Don't use spaces or weird characters in file names

- Escape character allows you to deal with them
(e.g., `dont\ name\ your\ files\ like\ this\ .txt`)

Job Submission

- Specifies the resources requested
- Specifies the command to be run
- Bash Language

Job Submission

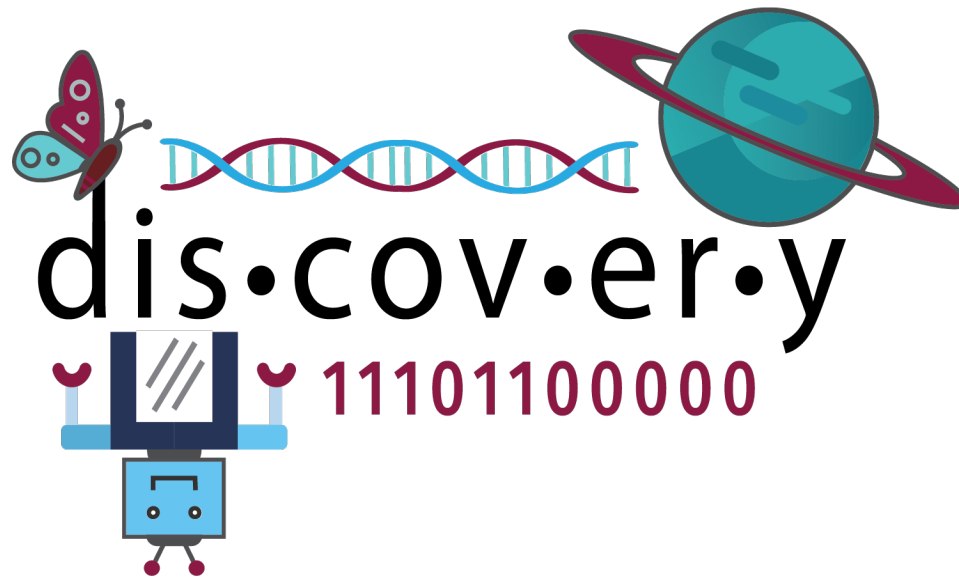
```
#!/bin/bash
#SBATCH --time=24:00:00
#SBATCH --mem=1G
#SBATCH --partition=class
#SBATCH --job-name=blastn
#SBATCH --ntasks=24
#SBATCH --nodes=1
#SBATCH --cpus-per-task=1
#SBATCH --mail-user=joel.sharbrough@nmt.edu
#SBATCH --mail-type=ALL
#SBATCH --error=blastn.err
#SBATCH --output=blastn.out

module load blast

blastn -db mtDNA.fasta -query query.fasta -outfmt 6 -max_target_seqs 1 -out mtDNA.out -num_threads 24
```


Next up: Discovery HPC On-Boarding

HW #6 HPC VPN form (already done)



First writing assignment is due in two weeks (3/14)