CIS 106 Midterm Spring 2021

Rules:

- You are not allowed to use Slack for anything else other than reporting an error with the midterm.
- To report an error, DM me directly. Do not post on any public channel.
- You have to work on this midterm alone. Cheating will be reported to the Dean of Students.
- You have to submit this midterm as a PDF file.
- Do not post your midterm or any solutions/screenshots to Slack or Github.
- For every question and sub-questions, you must highlight the commands that answer the particular question. See an example at the end of this document.

How to submit my work

- Before you start working on this midterm, create a directory called: **`Solutions-SP-21`**
- Inside the **`Solutions-SP-21`** directory, create a file named: **`solutions-fistname-lastname-midterm.md`**. For example, my file would be named: **`solutions-robert-alberto-midterm.md`**
- This is the file that you will use to answer all the questions. Open the file in any text editor of your choice and add the following text. I added some placeholder text to help you format your document.

```
* Name: **Your name here**
* Semester: **Spring 2019**

# Midterm Spring 2021
## Question 1
> Type your answer to question 1 here
## Question 2
[image description](screenshot path here)
## Question 3

## Question 4

## Question 5

## Question 6

## Question 7

## Question 8

## Question 9

## Question 10
```

- Save all your screenshots using the following naming convention: **`q1.1.png`** where the first number represents the question and the second number represents the sub-question. For example, question 1 part 1.
- Once you have completed your midterm, open the directory **`Solutions-SP-21`** in VS Code and add all the images to the file **`solutions-firstname-lastname-midterm.md`**. Export the file as pdf and submit the pdf file in Blackboard. Watch this video to see an example of what I am talking about.

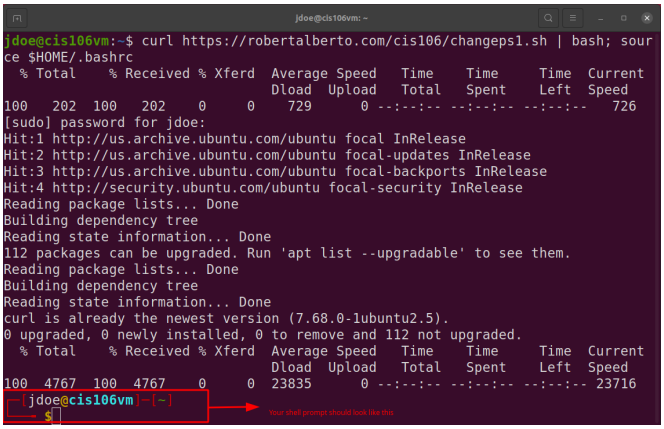
Pre Work:

You must complete these tasks before working on the midterm.

1. Create a directory called **`midtermS21.`**
2. Inside **`midtermS21,`** create one directory for each question.
3. The directory structure should look like this:

```
midtermS21/
├── question1
├── question10
├── question2
├── question3
├── question4
├── question5
├── question6
├── question7
├── question8
└── question9
```

4. After creating your directory structure, run the following script from your home directory: https://robertalberto.com/cis106/changeps1.sh
   - Use this command:
     - **`curl https://robertalberto.com/cis106/changeps1.sh | bash; source $HOME/.bashrc`**
5. Your shell prompt should look like this:



Question 1

Joseph's boss has been talking about upgrading the computer lab. The computers are currently running Windows 7 and have the following specifications:

- **RAM:** 2GB
- **CPU:** Intel Core i3 4th Generation
- **HDD:** 50 GB Toshiba 7200 RPM
- **Networking:** 2 Ethernet cards

These computers are used for **internet browsing, editing documents, and teaching programming classes like Python, C++, and web development.** Joseph's boss heard some of his colleagues talk about Ubuntu, therefore, he is thinking about migrating the lab to Ubuntu instead of upgrading the computers. Joseph's boss is aware that if he decides to

upgrade the computers, he will need to buy more RAM for each machine and a Windows 10 license for each machine. Joseph's boss has asked him to test Ubuntu and give him a written report on whether he should migrate the lab to Ubuntu or invest in upgrading the machines.

1. Write a short paragraph explaining why it is a good idea to migrate the computers to Ubuntu instead of buying new machines or upgrading the current machines to Windows 10. If you happen to disagree with Joseph's boss, write a paragraph explaining why they should not migrate the lab to Ubuntu.
2. Your answer must be at least 1 paragraph long and at most 3 paragraphs. For the sake of this assignment, your answer will be considered a paragraph as long as it has at least 5 full sentences.
3. Proofread your answer! You are a college student, therefore, I am expecting a college-level response with proper grammar.
4. You will get a full grade for this question as long as you can defend your position with a properly formed argument. The only way to get this question wrong is by not addressing the problem itself. As a technology professional, you will be required to provide educated opinions on technology.

Type your answer here.

Question 2

- **You have to work from the directory: ~/midtermS21/question2.**

Joe is a very organized student. He likes to separate all his courses and semesters in different directories so that he can back up all the semester data easily at the end of the semester. For each course directory, he creates a different subdirectory for his **notes, assignments, and extra material**. Last semester, Joe's directory structure looked like this:

```
fall-2020/
├── CIS106
│   ├── assignments
│   ├── extramat
│   └── notes
├── CIS107
│   ├── assignments
│   ├── extramat
│   └── notes
├── EN101
│   ├── assignments
│   ├── extramat
│   └── notes
└── MA108
    ├── assignments
    ├── extramat
    └── notes
```

Next semester (fall 2021), Joe will be taking the following courses **`CIS108, EN102, BU101, CIS125.`** Additionally, Joe has a friend who already took all the courses he is going to take next semester. His friend has sent him a compressed file with the syllabus, book, and some notes for each class. You can find the compressed file here: https://robertalberto.com/cis106/midtermfiles/question2.tar Before you start working on this question, change directory your current working directory to **~/midtermS21/question2**

1. Create the directory structure for Joe's next semester. Take a screenshot showing the command or commands that you used to create the directory structure.
2. Show a tree of the directory structure. Take a screenshot of the tree.
3. Download the compressed file. (*You are not allowed to use a web browser. The file must be downloaded from the terminal*)
4. Extract the file and move the files to their respective directories.
5. Display a tree of the fall 2021 directory showing all the files and subdirectories with file permissions and file size in a human-readable format.

Take a screenshot (or multiple if needed) of all the commands you used to answer this question. Highlight the commands that answer the questions. See an example at the end of the document.

Question 3

- **Before working on this question, clear your terminal screen.**
- **You have to work from the directory: ~/midtermS21/question3**
- **You have to use Brace Expansion in this question otherwise you will only earn 30%**

Problem to solve.

Chris is starting a new project for his web development course. He will require the following directories:

- `sql`
- `html`
- `js`
- `css`

Inside the **`sql`** directory, Chris needs 2 files

- `script1.sql`
- `script2.sql`

Inside the **`html`** directory he needs 3 files:

- `home.html`
- `contac.html`
- `products.html`

Inside the **`css`** directory, he needs 2 files:

- `base.css`
- `reset.css`

Inside the **`js`** directory he needs 3 files:

- `slide.js`
- `loader.js`
- `script.js`

Instructions to solve the problem:

1. Create a directory called **`carCompany`** and inside the **`carCompany`** directory, create all the files and directories that Chris needs.
2. List all the files inside the **`carCompany`** directory recursively, with human-readable file sizes, sorted in reverse order, and without group and owner.
3. Create a tar archive of the **`carCompany`** directory and compress the archive using any compression program.
4. Move the tar archive to your **`Documents`** directory and remove the **`carCompany`** directory.

Take a screenshot (or multiple if needed) of all the commands you used to answer this question. Highlight the commands that answer the questions. See an example at the end of the document.

Question 4

- **You have to work from the directory: ~/midtermS21/question4**
- **Before working on this question, clear your terminal screen.**
- **Maria's Colleague Files can be found here:** https://robertalberto.com/cis106/midtermfiles/maria-colleage-files.tar.xz

Maria is a junior IT Technician at JNJ Community College. One of the faculty members has given her a flash drive with a lot of files. Maria's job is to organize those files in a way that makes sense. She also needs to create a text file that has all the file names and a brief description of them. The file needs to look like this:

```
                                                    cat all-your-files.md
# These are windows executable files
-------------
-rw-rw-r-- 1 adrian adrian 109 Apr 21 16:54 executable file
-rw-rw-r-- 1 adrian adrian 109 Apr 21 16:54 executable file
# These are all your word documents
-------------
-rw-rw-r-- 1 adrian adrian 200 Apr 21 16:54 word document
-rw-rw-r-- 1 adrian adrian 201 Apr 21 16:54 word document
-rw-rw-r-- 1 adrian adrian 302 Apr 21 16:54 word document
# These are all your Excel Sheets
-------------
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Excel Spreadsheet
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Excel Spreadsheet
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Excel Spreadsheet
# These are all your Picture files
-------------
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Image file
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Image file
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Image file
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Image file
-rw-rw-r-- 1 adrian adrian   79 Apr 21 16:51 Image file
```

Maria also needs to organize those files in different directories and then create an archive that includes all the folders. The archive needs to be compressed because it will be shared over the internet at some point. You can use any archiving and compression utility you like.

Follow these instructions to solve this problem:

1. Clear your terminal screen and change your current working directory to **`~/midtermS21/question4`**
2. Download and unarchive the tar file that contains all the files in Maria's colleague's flash drive. Delete the archive after unarchiving it.
3. Create a file named **`all-files-org.md`** where you are going to append the listing of all the files by file type. The listing of the files must include their **file size in human-readable format and their permissions.** See the image above for an example. You can use any combination of commands to achieve the creation of the file.
4. Create the necessary directories to organize the files. Use any naming convention you want for the directory names as long as it makes sense.

5. Display a tree of the parent directory where you place all the directories of step 3 and append the output of the tree command to the **`all-files-org.md`**.
6. Create an archive of all the directories of step 3 and compress the archive using any compression tool you want.
7. List the archive and the **`all-files-org.md`** file showing their file size in human-readable format.

Take a screenshot (or multiple if needed) of all the commands you used to answer this question. Highlight the commands that answer the questions. See an example at the end of the document.

Question 5

- **You have to work from the directory: ~/midtermS21/question5 unless specified otherwise.**
- **You will be required to install the Apache webserver in this question.**

You have been asked to fix a website. The problem with the site is not the code so there is no need to modify the code. The problem is that the files are not stored in their appropriate directory. Your goal in this question is to create the necessary directories and move the files to their appropriate directories. Once you have moved the files, open the site in your web browser. The website should look like this:
https://robertalberto.com/cis106/midtermfiles/samplesite2/index.html

1. Clear your terminal screen and change your current working directory to **`~/midtermS21/question5`**
2. Download the website and all its files from here: https://robertalberto.com/cis106/midtermfiles/samplesite2.tar.gz
3. Fix the website. You can open the **`index.html`** file in Firefox at any time to see your progress.
4. Install the software package **apache2**. Apache2 is the webserver software.
5. Change directories to **`/var/www/html/`**. Here rename the file **`index.html`** to **`index.html.bk`**. Go back to your home directory.
6. Move all the files inside the website directory (the one you fixed) to the **`/var/www/html/`** directory.
7. Run the following commands:
    a. **`sudo systemctl enable apache2`**
    b. **`sudo systemctl restart apache2`**
8. Take a screenshot of all the commands you use to complete this question.
9. Open Firefox and go to the URL http://localhost. This is the website that you fix and it should look like the one here https://robertalberto.com/cis106/midtermfiles/samplesite2/index.html.
10. To document all your work:
    a. *Take a screenshot showing the commands you used to answer question 2,3,4 and 5*
    b. *Take a screenshot of firefox with the site: http://localhost open. The URL must be visible in your screenshot.*

Question 6

- **You have to work from the directory: ~/midtermS21/question6 unless specified otherwise.**
- **You are not allowed to use multiple commands separated by a ;**
- **There is more than 1 way to get this done.**

1. Use a single command to find out the file size of the following files:
    a. /etc/passwd
    b. /etc/group
    c. /etc/shadow
    d. ~/.bashrc
2. /usr/share/dict/american-english

3. Save the output of the command to a file named sizes.
4. Display the content of the file sizes

Take a screenshot (or multiple if needed) of all the commands you used to answer this question. Highlight the size of the files from the output of the command. See an example at the end of the document.

Question 7

- **You have to work from the directory: ~/midtermS21/question7 unless specified otherwise.**

Download an image from the internet and use the command line to answer the following questions about the image.

1. What is the Absolute path of the image?
2. What is the inode number of the image?
3. Which command would you use to move the file from its current location to the /usr/share/backgrounds and rename it at the same time? Make sure to include the whole command.
4. What command would you use to know the size of the image including its permissions and the full date of the last time it was modified?

Take a screenshot (or multiple if needed) of all the commands you used to answer this question. Highlight the commands that answer the questions. See an example at the end of the document.

Question 8

- You have to use wildcards to answer this question otherwise you will receive 30% of the credit.
- **You have to work from the directory: ~/midtermS21/question8 unless specified otherwise.**
- Download this file:
    - https://robertalberto.com/cis106/midtermfiles/mcu.tar.xz

1. Create a directory named: **`midterm-q8`**
2. Extract the archives in the **`midterm-q8`** directory.
3. Upon completing step 2, you should have a directory in the midterm-q9 directory called: **`marvel-movies.`**
4. List all the files that do not have a number before the file extension showing their hard link count, size in human-readable format, and modification date. The output cannot have the file permissions.
5. Organize all images in the **`marvel-movies`** directory so that every movie franchise has its own directory.
6. List only the directories inside **`marvel-movies`** without the user nor group.

Take a screenshot (or multiple if needed) of all the commands you used to answer this question. Highlight the commands that answer the questions. See an example at the end of the document.

Question 9

- You have to use wildcards to answer this question otherwise you will receive 30% of the credit.
- **You have to work from the directory: ~/midtermS21/question9 unless specified otherwise.**
- Download this file:
    - https://robertalberto.com/cis106/midtermfiles/vgc.tar.xz

1. Create a directory named: **`midterm-q9`**
2. From your home directory, extract both of the archives in the **`midterm-q9`** directory.
3. Upon completing step 2, you should have a directory in the **`midterm-q9`** directory called: **`videogame-consoles`**.

4. List all the files in the **`videogame-consoles`** directory that have a date between 1980 and 1999 in the file name.
5. List all the files in the **`videogame-consoles`** directory that have a date between 2000 and 2009 in the file name.
6. Create a directory for every decade represented in the file names and move or copy the file if it falls under more than one decade to its respective folder.

Take a screenshot (or multiple if needed) of all the commands you used to answer this question. Highlight the commands that answer the questions. See an example at the end of the document.

Question 10

1. Which was the hardest question? Why?
2. Which was the easiest question? Why?
3. What could have made this midterm easier?
4. On a scale from 1 to 5 (1 meaning nothing at all and 5 meaning a lot more than you thought), how much have you learned about Linux?
5. In your opinion, do you think this format of the examination is better or worse than the traditional exams? A traditional exam is in the form of true or false questions and selects the right answer or short explanations.

Example

Example question

Joe wants to generate random files for testing some commands. He needs to generate 5 files. Follow the instructions below to answer the question:

1. Create a random text file named random.txt
2. Create a random image file named image.png
3. Create a random audio file named audio.mp3
4. List all the files using their file extension and a wildcard.
5. Which file is the biggest?

Example screenshot answer