

SECSR2043 OPERATING SYSTEMS

[20 Marks]

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 Section : 2

Marks

Instruction: Please answer all of the following questions. Whenever the 🙋 symbol appears, please raise your hand to call your instructor, he/she will verify your results by putting his / her initial next to the symbol.

1. Type the following commands using a text editor and save it as a *yourname.sh* (Example: *ahmad.sh*).

```
echo "Hello world" > helloworld.jar
mkdir cars; mkdir dates; mkdir fruits drinks
cd cars; echo "Honda Accord" > accord.c
cp accord.c civic.c; echo proton > proton.c; cd ../dates;
date > dateoftheday
cat dateoftheday > appointment
cd ../fruits; echo apple > apple.txt; cat apple.txt >
orange.txt
cd drinks; cp ../cars/*.c .; cp ../fruits/*.c .;
cp ../*.jar .
```

- a) Execute the script and draw a tree structure that contains created directories and files. The parent node of the directory begin with **\$HOME** directory.

[4 marks]



Print screen the script that you type;

```

GNU nano 7.2
echo "Hello world" > helloworld.jar
mkdir cars; mkdir dates; mkdir fruits drinks
cd cars; echo "Honda Accord" > accord.c
cp accord.c civic.c; echo proton > proton.c; cd ../dates;
date > dateoftheday
cat dateoftheday > appointment
cd ../fruits; echo apple > apple.txt; cat apple.txt > orange.txt
cd ../drinks; cp ../cars/*.c .; cp ../fruits/*.c .;
cp ../*.jar .

```

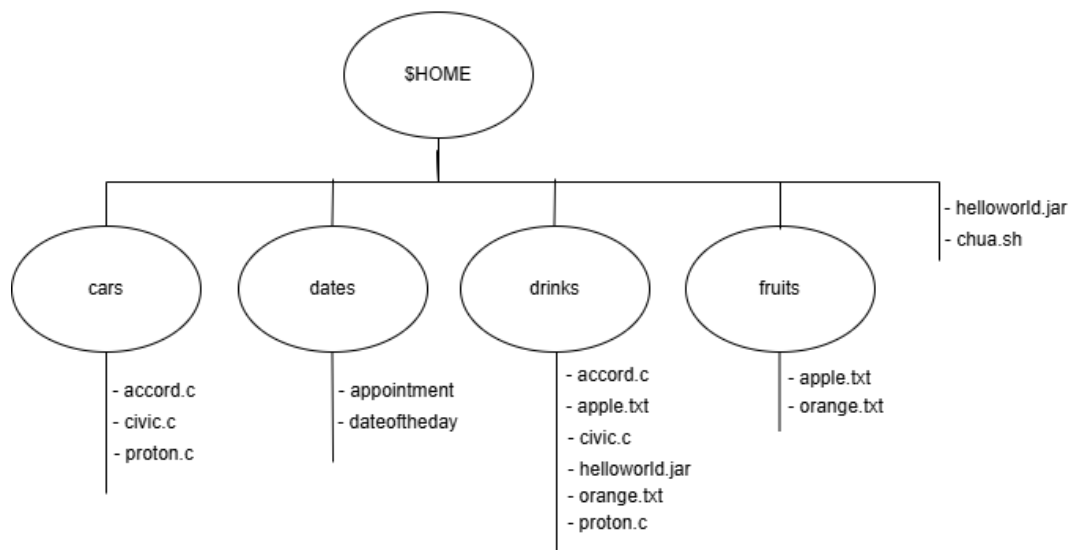
Then draw the tree

```

cjl@secr2043:~$ chmod +x chua.sh
cjl@secr2043:~$ ./chua.sh
cjl@secr2043:~$ tree
.
├── cars
│   ├── accord.c
│   ├── civic.c
│   └── proton.c
├── chua.sh
├── dates
│   ├── appointment
│   └── dateoftheday
├── drinks
│   ├── accord.c
│   ├── apple.txt
│   ├── civic.c
│   ├── helloworld.jar
│   ├── orange.txt
│   └── proton.c
├── fruits
│   ├── apple.txt
│   └── orange.txt
└── helloworld.jar

5 directories, 15 files
cjl@secr2043:~$

```



- b) Write an interactive bash script that will read a type of file extension, display all those files, and count the number of files. To validate your script, display c program files, and enter “c” as the input to the bash script. [4 marks]

Print screen the bash script you type and run

```
GNU nano 7.2
#!/bin/bash

# Prompt the user to enter a file extension
read -p "Enter the file extension (without the dot): " ext

# Find and display all files with the given extension
echo "Files with .${ext} extension:"
find . -type f -name "*.${ext}"

# Count the number of files with the given extension
count=$(find . -type f -name "*.${ext}" | wc -l)
echo "Number of files with .${ext} extension: $count"
```

```
cjl@secr2043:~$ chmod u+x ifiles.sh
cjl@secr2043:~$ ./ifiles.sh
Enter the file extension (without the dot): c
Files with .c extension:
./drinks/civic.c
./drinks/accord.c
./drinks/proton.c
./cars/civic.c
./cars/accord.c
./cars/proton.c
Number of files with .c extension: 6
cjl@secr2043:~$
```

2. The following Figure 1 illustrates a tree structure of some directories and files.

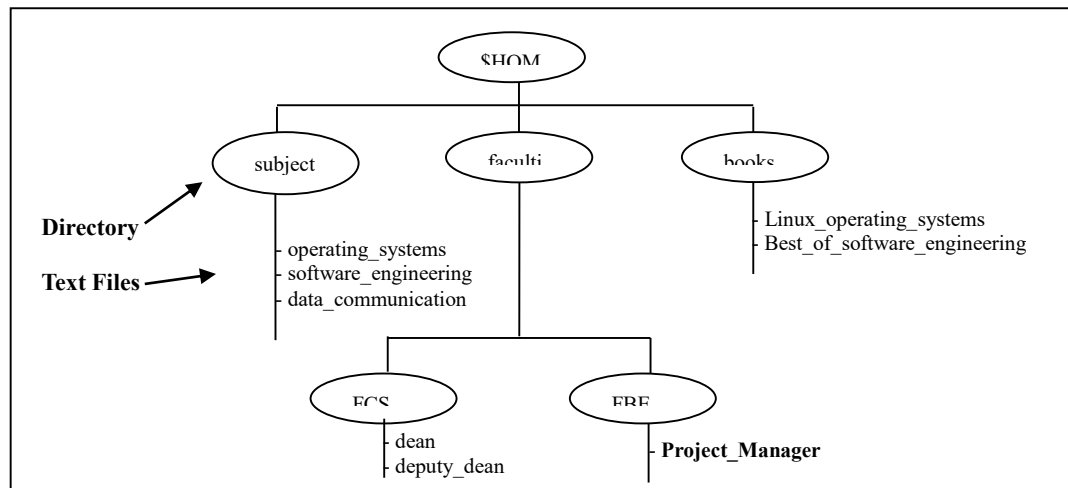


Figure 1

- a) Write a bash script (called `myname2a.sh`) that will produce directories and files as in Figure 1. Each text files contain its filename without the underscore character. For example: text file `Project_Manager` contains `Project Manager`). [4 marks]

Print screen the bash script you type and run

```

GNU nano 7.2                                     chua2i
#!/bin/bash

# Create directories
mkdir -p $HOME/subjects $HOME/faculties/FCS $HOME/faculties/FBE $HOME/books

# Create and write to text files in the subjects directory
echo "operating systems" > $HOME/subjects/operating_systems
echo "software engineering" > $HOME/subjects/software_engineering
echo "data communication" > $HOME/subjects/data_communication

# Create and write to text files in the faculties/FCS directory
echo "dean" > $HOME/faculties/FCS/dean
echo "deputy dean" > $HOME/faculties/FCS/deputy_dean

# Create and write to text files in the faculties/FBE directory
echo "Project Manager" > $HOME/faculties/FBE/Project_Manager

# Create and write to text files in the books directory
echo "Linux operating systems" > $HOME/books/Linux_operating_systems
echo "Best of software engineering" > $HOME/books/Best_of_software_engineering_

```



```

cjl@secr2043:~$ chmod u+x chua2a.sh
cjl@secr2043:~$ ./chua2a.sh
cjl@secr2043:~$ tree $HOME
/home/cjl
├── books
│   ├── Best_of_software_engineering
│   └── Linux_operating_systems
├── cars
│   ├── accord.c
│   ├── civic.c
│   └── proton.c
├── chua.sh
├── chua2a.sh
├── dates
│   ├── appointment
│   └── dateoftheday
├── drinks
│   ├── accord.c
│   ├── apple.txt
│   ├── civic.c
│   ├── helloworld.jar
│   ├── orange.txt
│   └── proton.c
├── faculties
│   ├── FBE
│   │   └── Project_Manager
│   └── FCS
│       ├── dean
│       └── deputy_dean
├── fruits
│   ├── apple.txt
│   └── orange.txt
├── helloworld.jar
├── ifiles.sh
├── subjects
│   ├── data_communication
│   ├── operating_systems
│   └── software_engineering
└── 10 directories, 25 files
cjl@secr2043:~$

```

- b) Complete the following table by writing the access control of directories or files that were produced. Given is the access control for directory called book.

[2 marks]

Directory/File	Access Control
books	drwxrwxr-x
subjects	drwxrwxr-x
Best_of_software_engineering	-rw-rw-r--
FCS	drwxrwxr-x
project_manager	-rw-rw-r--



```
cjl@secr2043:~$ ls -ld books subjects
drwxrwxr-x 2 cjl cjl 4096 Jun 13 08:45 books
drwxrwxr-x 2 cjl cjl 4096 Jun 13 08:45 subjects
cjl@secr2043:~$
```

```
cjl@secr2043:~$ ls -ld books/Best_of_software_engineering faculties/FCS faculties/FBE/Project_Manager
-rw-rw-r-- 1 cjl cjl 29 Jun 13 08:45 books/Best_of_software_engineering
-rw-rw-r-- 1 cjl cjl 16 Jun 13 08:45 faculties/FBE/Project_Manager
drwxrwxr-x 2 cjl cjl 4096 Jun 13 08:45 faculties/FCS
cjl@secr2043:~$
```

- c) Write another bash script (called myname2c.sh) that will change the access control of the directories and files based on the following information:

[4 marks]

Directory/File	Users								
	Owner			Group			Public		
subjects	✓	✓	✓	✓	x	x	✓	x	x
Best_of_software_engineering	✓	x	✓	x	✓	x	x	x	x
FCS	✓	✓	x	x	x	x	✓	✓	✓
project_manager	x	x	x	x	✓	✓	x	x	✓

Print screen the bash script you type and run

```
GNU nano 7.2
#!/bin/bash

# Set permissions for subjects directory
chmod 744 $HOME/subjects

# Set permissions for Best_of_software_engineering file
chmod 520 $HOME/books/Best_of_software_engineering

# Set permissions for FCS directory
chmod 607 $HOME/faculties/FCS

# Set permissions for Project_Manager file
chmod 031 $HOME/faculties/FBE/Project_Manager
```

```
cjl@secr2043:~$ chmod +x chua2c.sh
cjl@secr2043:~$ ./chua2c.sh
cjl@secr2043:~$ ls -ld subjects books/Best_of_software_engineering faculties/FCS faculties/FBE/Project_Manager
-r-x-w---- 1 cjl cjl 29 Jun 13 08:45 books/Best_of_software_engineering
----wx--- 1 cjl cjl 16 Jun 13 08:45 faculties/FBE/Project_Manager
drw---rwx 2 cjl cjl 4096 Jun 13 08:45 faculties/FCS
drwxr--r-- 2 cjl cjl 4096 Jun 13 08:45 subjects
cjl@secr2043:~$
```



- d) Complete the following table by writing the access control for each directory or file after executing the bash script in question 2(c)). [2 marks]

Directory/File	Access Control
subjects	drwxr--r--
Best_of_software_engineering	-r-x-w----
FCS	drw----rwx
project_manager	-----wx--x

End of Lab 3

*** *All the Best for Final Exam* ***