SECSR2043 OPERATING SYSTEMS
[20 Marks]

Name	: AMELIA ADLINA BINTI AZRUL	Marks
Student ID	: A23CS0043	
Section	: 01	

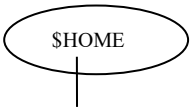
Instruction: Please answer all of the following questions. Whenever the ✋ symbol appears, please raise your hand to call your instructor, he/she will verify your results by putting his / her initial next to the symbol.

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/*.* .; cp ../fruits/*.* .;
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]

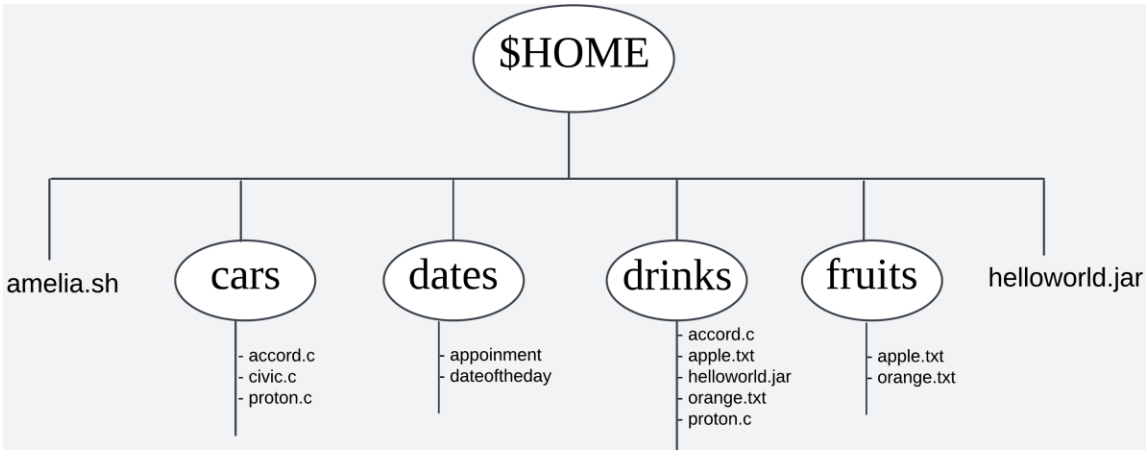


Print screen the script that you type;

```
amelia@secr2043: ~
 GNU nano 7.2                                    amelia.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/*.* .; cp ../fruits/*.* .;
cp ../*.jar .
```

```
amelia@secr2043:~$ tree
.
|-- amelia.sh
|-- cars
|   |-- accord.c
|   |-- civic.c
|   `-- proton.c
|-- 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
```



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]

```
 GNU nano 7.2                          ifiles.sh
#!/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 -1)
echo "Number of files with .${ext} extension: $count"
```

```
amelia@secr2043:~$ nano ifiles.sh
amelia@secr2043:~$ chmod u+x ifiles.sh
amelia@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
wc: invalid option -- '1'
Try 'wc --help' for more information.
Number of files with .c extension:
```

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

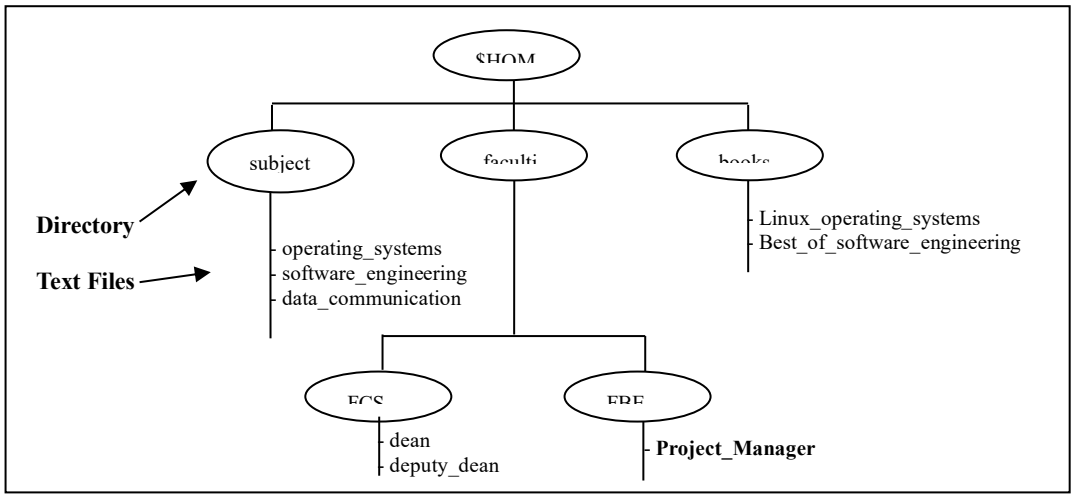


Figure 1

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]

```
  GNU nano 7.2                                                  myname2a.sh *
#!/bin/bash

# Create base directory
mkdir -p $HOME

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

# Create files under subjects
echo "operating systems" > $HOME/subjects/operating_systems
echo "software engineering" > $HOME/subjects/software_engineering
echo "data communication" > $HOME/subjects/data_communication

# Create files under books
echo "Linux operating systems" > $HOME/books/Linux_operating_systems
echo "Best of software engineering" > $HOME/books/Best_of_software_engineering

# Create files under faculties/FCS
echo "dean" > $HOME/faculties/FCS/dean
echo "deputy dean" > $HOME/faculties/FCS/deputy_dean

# Create file under faculties/FBE
echo "Project Manager" > $HOME/faculties/FBE/Project_Manager
```

```
amelia@secr2043:~$ nano myname2a.sh
amelia@secr2043:~$ chmod u+x myname2a.sh
amelia@secr2043:~$ ./myname2a.sh
amelia@secr2043:~$ tree $HOME
/home/amelia
|-- amelia.sh
|-- books
|   |-- Best_of_software_engineering
|   `-- Linux_operating_systems
|-- cars
|   |-- accord.c
|   |-- civic.c
|   `-- proton.c
|-- 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
|-- myname2a.sh
`-- subjects
    |-- data_communication
    |-- operating_systems
    `-- software_engineering

10 directories, 25 files
```

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	drwxrw-xr-x
subjects	drwxrw-xr-x
Best_of_software_engineering	-rw-r--r--
FCS	drwxrw-xr-x
project_manager	-rw-r--r--

```
drwxr-xr-x 2 amelia amelia 4096 Jul  1 04:55 books
drwxr-xr-x 2 amelia amelia 4096 Jul  1 04:55 subjects
-rw-r--r-- 1 amelia amelia 29 Jul  1 04:55 books/Best_of_software_engineering
drwxr-xr-x 2 amelia amelia 4096 Jul  1 04:55 faculties/FCS
-rw-r--r-- 1 amelia amelia 16 Jul  1 04:55 faculties/FBE/Project_Manager
```

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	✓

```
 GNU nano 7.2                                amelia2c.sh
#!/bin/bash

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

# Set persmissions 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
```

```
drwxr-xr-x 2 amelia amelia 4096 Jul  1 04:55 /home/amelia/subjects
-rw-r--r-- 1 amelia amelia 29 Jul  1 04:55 /home/amelia/books/Best_of_software_engineering
drwxr-xr-x 2 amelia amelia 4096 Jul  1 04:55 /home/amelia/faculties/FCS
-rw-r--r-- 1 amelia amelia 16 Jul  1 04:55 /home/amelia/faculties/FBE/Project_Manager
```

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 ****