

## CMP 255 Final Exam Project - Arjun Anand

Purpose: The purpose of this project is to show a complete understanding of the concepts learned in this course. As a team, you are to create the outline of a server using a Linux distro of your choice. The server could be any type such as a file, database, or web server. Your team will create the necessary files and scripts to create the server and duplicate it as needed.

Requirements:

**You must make a start file for each member of the team. These are to include at least 4-5 preferences for each person that will run upon login. You will also have to create two aliases in each of these files.**

Made the alias in `~/.bashrc: alias c='clear'`

Made the alias in `~/.bashrc: alias removeImgFiles='find ~/ -name *.jpeg -exec rm -rf {} \; & find ~/ -name *.png -exec rm -rf {} \;'`

In `~/.bashrc: Changed HISTFILESIZE from 2000 to 100`

In `~/.bashrc: export PATH=$PATH:./.bashrc`

**One script that allows for creating a new user account with basic startup (of your choosing) that can be moved to another machine. (10pts) (I will score this on your individual grade)**

Script:

```
#!/bin/bash
#NewUser
#Script to make a new user
#Must run as admin (sudo)
#One script that allows for creating a new user account with basic start up (of your choosing) that can be moved to another machine

echo -n "Enter username: "      # -n will avoid trailing line
read newUsername
useradd -s /usr/bin/bash $newUsername
passwd $newUsername
```

Output:

```
(Brian㉿kali)-[~/Project]
$ sudo ./NewUser
[sudo] password for Brian:
Enter username:ThisIsANewUser
New password:
Retype new password:
passwd: password updated successfully

(Brian㉿kali)-[~/Project]
$ users
Brian

(Brian㉿kali)-[~/Project]
$ cat /etc/shadow | tail -5
cat: /etc/shadow: Permission denied

(Brian㉿kali)-[~/Project]
$ sudo cat /etc/shadow | tail -5
user20:$y$9T$0mhQKcasZv7fMxAkeTBdE1$7aSTrHKLQndd2NC34hzH0ftvvAwZR/CQ5nWmxVD5dc6:18941:0:99999:7:::
NewUser25:$y$9T$VH2m/5j7VAj1r1NjwxSOK0$bfkNumZynlhhbbWU1v1vNY6fx8/uGceyEq6zukXwD:18970:0:99999:7:::
aclUser:$y$9T$LkHusyEQCpRw4ccUXYUIG1$lHLR9KdLQwaDrveoziaM206qsKW3bnSQtxeEAxXg049:18975:0:99999:7:::
TerrariaPlayer:$y$9T$mGNSStxpasWveTrBIDY.V0$lFGUVGg6R0Y8FTSaTiy2PlUKYmgheMEJCxxi88A2ns1:18975:0:99999:7:::
ThisIsANewUser:$y$9T$5sP0l0fzTH7ofkDwTrs/s1$V5pZTjq5cWBgQKoYoKfGzd3bKPKMzcojPuSehHOauI0:18975:0:99999:7:::
```

**Three additional scripts of your choice (security, file sharing, etc.) (10pts each/30pts total)**

(1) User Info Script:

```
#!/bin/bash
#Displays a calendar, the date, and the different users on the system

echo "_____"
echo -e "Calendar: \n"
cal
echo "_____"

echo "Date: "
date +'%A %D'
echo "_____"

echo "Users on the system:"
finger
```

```
└─(kali㉿kali)-[~/labs]
└─$ ./userInfo
```

\_\_\_\_\_

Calendar:

```
      December 2021
Su Mo Tu We Th Fr Sa
      1  2  3  4
 5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31
```

\_\_\_\_\_

Date:

Friday 12/10/21

\_\_\_\_\_

Users on the system:

Login	Name	Tty	Idle	Login Time	Office	Office Phone
kali	Kali	tty7	23	Dec 10 12:59	(:0)	

## (2) Password Encryptor:

```
#!
#String followed by echo command '$1' is the password string that is to be encrypted and
#'$2' is the password that is used during the encryption.
echo $1 | openssl enc -aes-256-cbc -md sha512 -a -pbkdf2 -iter 100000 \
-salt -pass pass:$2 > EncryptedPasswords.txt
```

```
└─(Brian㉿kali)-[~/Project]
$ sudo ./EncryptPass hello test
[sudo] password for Brian:

└─(Brian㉿kali)-[~/Project]
$ ls -a
. .. askTable EncryptedPasswords.txt EncryptPass innerJoin.sql NewUser outerJoin.sql test

└─(Brian㉿kali)-[~/Project]
$ vim EncryptPass

└─(Brian㉿kali)-[~/Project]
$ cat EncryptedPasswords.txt
U2FsdGVkX1903DsPf37g4rMdQXUNmMgjL/G10k9DDl8=
```

## (3) Password Requirement Checker:

```
numbers = ["1", "2", "3", "4", "5", "6", "7", "8", "9", "0"]
letters = ["a", "b", "c", "d", "e", "f", "g", "h", "i", "j", "k", "l", "m", "n", "o", "p", "q", "r", "s", "t", "u", "v", "w", "x", "y", "z"]
special = ["!", "@", "#", "$", "%"]

pwd = raw_input("Password: ")

if len(pwd) >= 10:
    print("GOOD: Your password is long enough")
else:
    print("BAD: Your password is too short")

for x in range(len(pwd)):
    if pwd[x] in numbers:
        print("GOOD: Your password contains numbers")
        break
    else:
        print("BAD: Your password does not contain numbers")

for x in range(len(pwd)):
    if pwd[x] in letters:
        print("GOOD: Your password contains letters")
        break
    else:
        print("BAD: Your password does not contain letters")

for x in range(len(pwd)):
    if pwd[x] in special:
        print("GOOD: Your password contains special characters")
        break
    else:
        print("BAD: Your password does not contain special characters")
```

```
└─(kali㉿ kali)-[~]
$ python password.py
Password: jlkfadjkf34@
GOOD: Your password is long enough
GOOD: Your password contains numbers
GOOD: Your password contains letters
GOOD: Your password contains special characters
```

## A very simple database using MySQL or MariaDB of three tables (10pts)

Database:

```
Database changed
MariaDB [Terraria]> show tables;
+-----+
| Tables_in_Terraria |
+-----+
| Magic_Weapons      |
| Melee_Weapons     |
| Ranged_Weapons    |
| Summoners          |
+-----+
4 rows in set (0.000 sec)

MariaDB [Terraria]> █
```

Tables:

```
MariaDB [Terraria]> select * from Magic_Weapons;
+----+-----+-----+-----+
| id | name           | description                                | Damage | Mana | Rarity |
+----+-----+-----+-----+
| 1  | Last Prism     | Fire a lifeform disintegration rainbow   | 100   | 12  | Red   |
| 2  | Lunar Flare    | Rains down lunar flares                 | 100   | 13  | Red   |
| 3  | Betsy's Wrath  | Splashes defense reducing miasma!       | 100   | 14  | Yellow |
| 4  | Staff of Earth  | Summons a powerful boulder                | 125   | 18  | Lime  |
| 5  | Nebula Blaze   | 'From Orion's belt to the palm of your hand' | 130   | 12  | Red   |
+----+-----+-----+-----+
5 rows in set (0.000 sec)

MariaDB [Terraria]> select * from Melee_Weapons;
+----+-----+-----+-----+-----+
| id | Name            | Description                               | Damage | Critical_Damage_Chance | Rarity |
+----+-----+-----+-----+-----+
| 1  | Zenith          | Every Blade swings around the player     | 190   | 14% | Red   |
| 2  | Meowmere        | Rains Cats                                | 200   | 4%  | Red   |
| 3  | Star Wrath      | Rains stars from the sky                 | 110   | 4%  | Cyan  |
| 4  | Tera Blade      | Sword of the Hero                         | 115   | 4%  | Yellow |
| 5  | Flying Dragon   | Unleashes the heart's energy forward    | 180   | 4%  | Yellow |
| 6  | Starlight        | Fires light beams                        | 80    | 14% | Yellow |
| 7  | Seedler          | Fires grenade-like projectiles          | 50    | 4%  | Pink  |
| 8  | Death Sickle    | Shoots a deathly sickle                  | 57    | 4%  | Light Purple |
| 9  | Frostbrand      | Shoots an icy bolt                      | 49    | 4%  | Pink  |
| 6  | Starlight        | Fires light beams                        | 80    | 14% | Yellow |
| 7  | Seedler          | Fires grenade-like projectiles          | 50    | 4%  | Pink  |
| 8  | Death Sickle    | Shoots a deathly sickle                  | 57    | 4%  | Light Purple |
| 9  | Frostbrand      | Shoots an icy bolt                      | 49    | 4%  | Pink  |
| 6  | Starlight        | Fires light beams                        | 80    | 14% | Yellow |
| 7  | Seedler          | Fires grenade-like projectiles          | 50    | 4%  | Pink  |
| 8  | Death Sickle    | Shoots a deathly sickle                  | 57    | 4%  | Light Purple |
| 9  | Frostbrand      | Shoots an icy bolt                      | 49    | 4%  | Pink  |
| 10 | Breaker Blade   | Deals more damage to unhurt enemies     | 43   | 4%  | Light Red |
+----+-----+-----+-----+
18 rows in set (0.000 sec)

MariaDB [Terraria]> select * from Ranged_Weapons;
+----+-----+-----+-----+-----+
| id | Name            | Description                               | Damage | Crit_Chance | Use_Time |
+----+-----+-----+-----+-----+
| 1  | Phantasm         | 60% chance to not consume ammo        | 50   | 4%  | 12   |
| 2  | Eventide         | Auto-fires 5 projectiles              | 50   | 4%  | 30   |
| 3  | Tsunami          | Shoots 5 arrows at a time             | 53   | 4%  | 24   |
| 4  | Aerial Bane      | Shoots splitting arrows               | 55   | 7%  | 30   |
| 5  | Pulse Bow         | Shoots a charged arrow                | 85   | 11% | 20   |
+----+-----+-----+-----+
5 rows in set (0.000 sec)

MariaDB [Terraria]> select * from Summoners;
+----+-----+-----+-----+
| id | Name            | Description                                | Damage | Mana | Rarity |
+----+-----+-----+-----+
| 1  | Stardust Dragon Staff | Summons a stardust dragon to fight for you | 40   | 10  | Red   |
| 2  | Xeno Staff       | Summons a UFO to fight for you           | 36   | 10  | Yellow |
| 3  | Terraprismra    | Summons an Enchanted Sword to fight for you | 90   | 10  | Pink  |
| 4  | Tempest Staff    | Summons sharknados to fight for you      | 50   | 10  | Yellow |
| 5  | Raven Staff       | Summons a raven to fight for you          | 55   | 10  | Yellow |
+----+-----+-----+-----+
5 rows in set (0.000 sec)
```

**A script either in Python or Perl that calls to these tables and returns a query result (10pts)**

Script:

```
import mysql.connector
mydb = mysql.connector.connect(
    host="localhost",
    user="root",
    password="mainpassword",
    database="project_tables"
)
mycursor = mydb.cursor()
mycursor.execute("SELECT (id),Name FROM Melee_Weapons")
myresult = mycursor.fetchall()
for x in myresult:
    print(x)
```

Output:

```
(kali㉿kali)-[~/labs]
$ python3 query.py
(1, 'Zenith')
(2, 'Meowmere')
(3, 'Star Wrath')
(4, 'Tera Blade')
(5, 'Flying Dragon')
(6, 'Starlight')
(7, 'Seedler')
(8, 'Death Sickle')
(9, 'Frostbrand')
(6, 'Starlight')
(7, 'Seedler')
(8, 'Death Sickle')
(9, 'Frostbrand')
(6, 'Starlight')
(7, 'Seedler')
(8, 'Death Sickle')
(9, 'Frostbrand')
(10, 'Breaker Blade')
```

**Another script that creates an inner join between two of the tables and creates an outer join in two tables (either right or left) (10pts each/20 pts total)**

Inner Join Script:

```
/* Creates an inner join between Melee_Weapons and Summoners using id's */
SELECT * FROM Melee_Weapons INNER JOIN Summoners USING (id);
```

Inner Join Output:

```
Database changed
MariaDB [project_tables]> Source /home/kali/labs/join.sql;
+-----+-----+-----+-----+-----+-----+-----+-----+
| id   | Name      | Description           | Damage | Critical_Damage_Chance | Rarity | Name          | Description
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1    | Zenith    | Every Blade swings around the player | 190  | 14%                | Red    | Stardust Dragon Staff | Summons a s
tardust dragon to fight for you | 40   | 10   | Red   |
| 2    | Meowmere  | Rains Cats             | 200  | 4%                 | Red    | Xeno Staff          | Summons a U
FO to fight for you          | 36   | 10   | Yellow |
| 3    | Star Wrath | Rains stars from the sky | 110  | 4%                 | Cyan   | Terraprisma        | Summons an
Enchanted Sword to fight for you | 90   | 10   | Pink   |
| 4    | Tera Blade | Sword of the Hero       | 115  | 4%                 | Yellow | Tempest Staff      | Summons sha
rknados to fight for you     | 50   | 10   | Yellow |
| 5    | Flying Dragon | Unleashes the heart's energy forward | 180  | 4%                 | Yellow | Raven Staff         | Summons a r
aven to fight for you        | 55   | 10   | Yellow |
+-----+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.000 sec)
```

Outer Join Script:

```
/* Creates an outer left join between Ranged_Weapons and Summoners based on each of their Name and Damage */
SELECT Ranged_Weapons.id, Ranged_Weapons.Name, Ranged_Weapons.Damage, Summoners.Name, Summoners.Damage
FROM Summoners
LEFT JOIN Ranged_Weapons
ON Ranged_Weapons.id = Summoners.id;
```

Outer Join Output:

```
Database changed
MariaDB [project_tables]> Source ~/labs/outerLeftJoin.sql
+-----+-----+-----+-----+-----+
| id   | Name      | Damage | Name          | Damage |
+-----+-----+-----+-----+-----+
| 1    | Phantasm  | 50    | Stardust Dragon Staff | 40
| 2    | Eventide   | 50    | Xeno Staff          | 36
| 3    | Tsunami    | 53    | Terraprisma        | 90
| 4    | Aerial Bane | 55    | Tempest Staff       | 50
| 5    | Pulse Bow   | 85    | Raven Staff         | 55
+-----+-----+-----+-----+-----+
5 rows in set (0.011 sec)
```

**Create at least three job classes with rules for file access and sharing and use ls -l to show them (10pts)**

```
[Brian@kali:[~/Project]
$ getfacl -a ~/Project
getfacl: Removing leading '/' from absolute path names
# file: home/Brian/Project
# owner: Brian
# group: kali
user::rwx
user:aclUser:rw-
user:TerrariaPlayer:--x
group::r-x
group:Project_Group:r-x
mask::rwx
other::r-x
```

```
[Brian@kali:[~/Project]
$ su TerrariaPlayer
Password:
TerrariaPlayer@kali:/home/Brian/Project$ ls -l
ls: cannot open directory '.': Permission denied
```

**A two page written security policy describing file access permission rules, password requirements, and a basic disaster recovery plan (10pts)**

(Attached on Blackboard)

Due: Last day of class.

Submission requirements: All data files (either script or txt format) plus screenshots showing all working code & word document for security policy