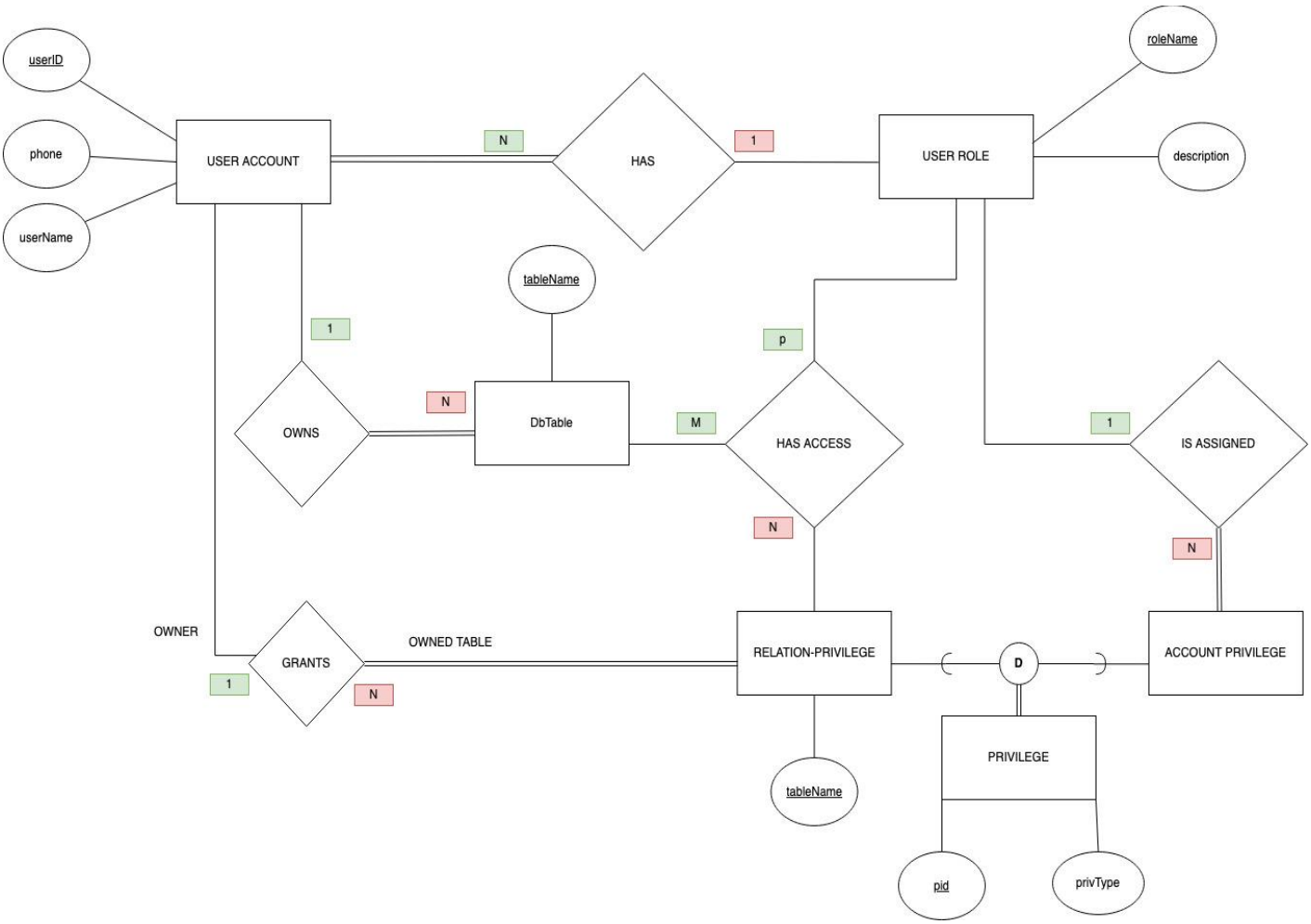
Discretionary Access Control

CSE5330 Project 2

Project Report

Nikhil Sujith | 1001768092
Abhishek Shinde | 1001754842

Part 1 – EER Diagram



Basic Assumptions

1. The user account has userID which is the primary key to identity the user account.
2. The user role has roleName as the primary key to uniquely identify each role in the system
3. DbTable has tableName as the primary key to identify each unique table in the system.
4. Privilege is disjoint to 2 types.
5. User Account can only be assigned to 1 user role
6. Multiple user accounts can be assigned to a role.
7. If a role is given a privilege, then all users assigned to that role will have that privilege

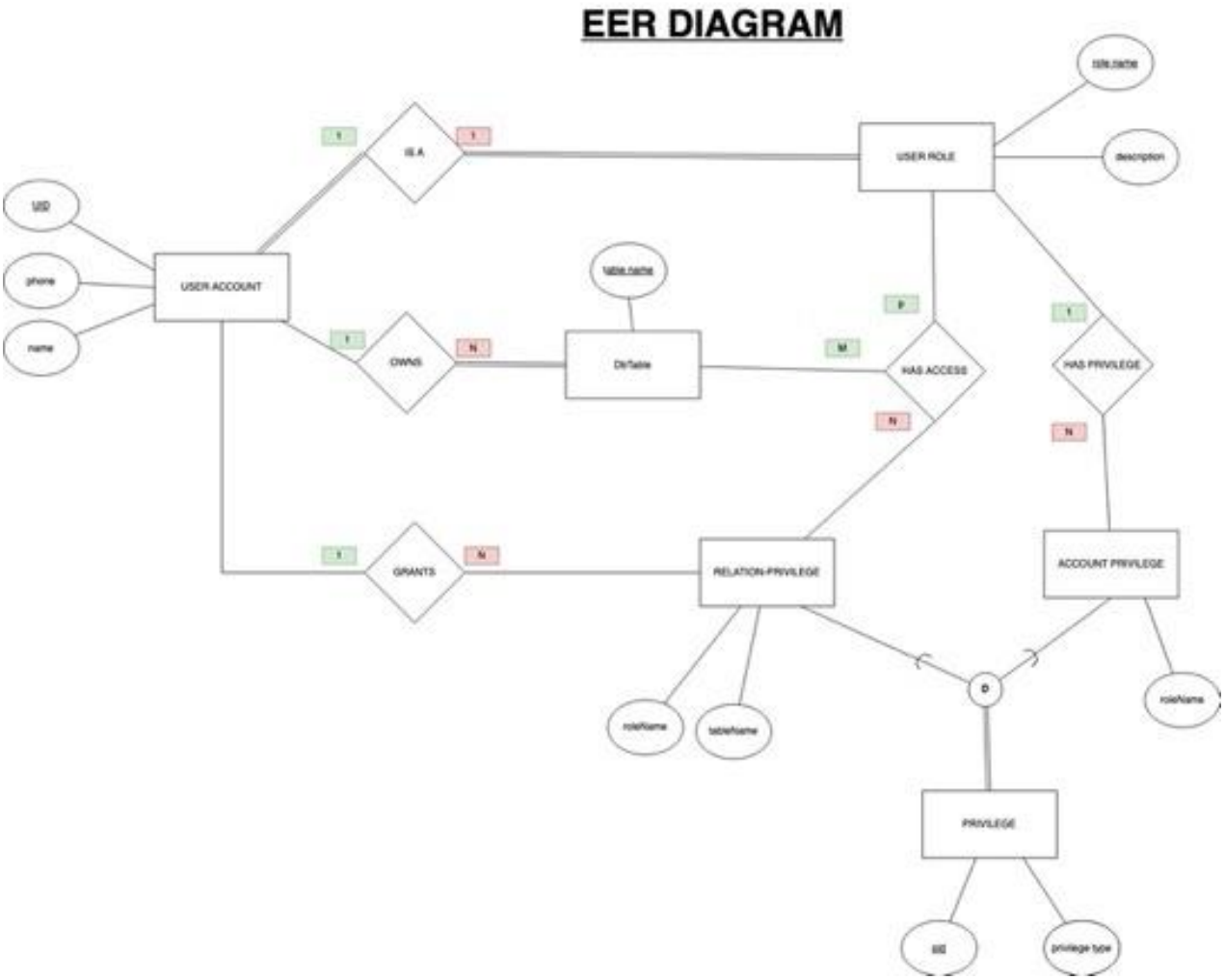
8. An user account can own multiple tables
9. A table can only be owned by a single user account
10. An user role can be assigned multiple account privileges
11. An user role can have multiple relation privileges on multiple tables
12. A table can be granted multiple privileges on multiple roles
13. A relation privilege on a table can be granted to multiple roles.

Additional Assumptions

14. An user may own a table and that user will have all privileges on the table they own.
15. The owner of the table can then allow certain privileges on the table they own.
16. The owner of the table can then allow certain roles to access certain privileges on the table they own.
17. The owner of the table can revoke privileges that they might have assigned to a role on the owned table.
18. The owner of the table can grant privileges to roles on the owned table, if the role also has been allowed to perform those operations by the super-user.
19. Each role will be assigned certain privileges on them, and the role can only perform those operations as permitted by the privileges.
20. The system has been implemented to follow “Strict DAC” where there can only be a single level of access grants, where the owner can grant access on owned relation to another user / role but the other user / role will not be allowed any propagation of privileges.
21. A privilege can only be granted and revoked by the owner of the table.

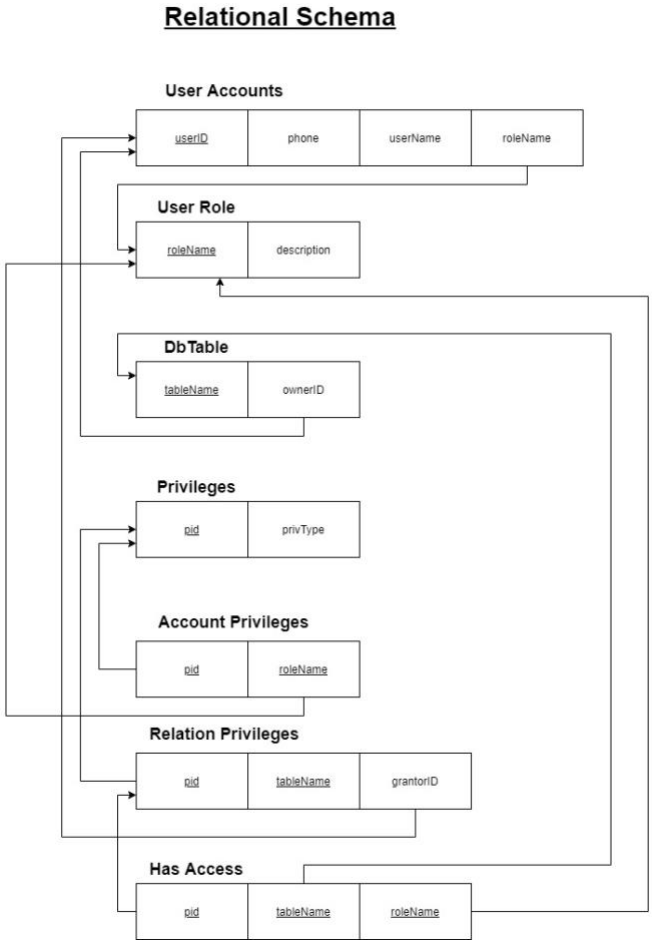
Changes made to EER

Initial EER



1. The mapping for user accounts and user role has been changed from 1:1 to N : 1. The reason for this change being, initially the assumption was that each role will have a single user. However, during the mapping stage we realized that
2. The participation for user accounts and relation privilege has been update to total participation on the relations privilege side. This is for the fact that relation privileges has to be given by an owner who is also represented as a user account in the database.
3. Some attributes have been adjusted to match the requirements and assumptions.
4. The participation for user the user role side of has relationship has been changes from total to partial. This was because, we found it more practical for the user role to be optionally assigned user accounts. This arises from a scenario where the system actor[person using the system] may decide to first only create role and later assign users as and when they see fit.

Part 2 – EER to Relational Mapping



Mapping of regular (strong) entity types

In this step, we map the strong entities in our project, I.e. User Account, User Role, DBTable and Privilege , by creating a Relation with their simple attributes present in it, and select one of the attributes as a Primary Key.

Mapping of Binary Relationships

I) Mapping of 1:N Relationship:

1:N Relationship for User Account and DBTable:

We map this relationship by adding a Foreign Key in DBTable which references the Primary Key of User Accounts.
Here, the Foreign key is ownerID which references userID in User Accounts.

1:N Relationship for User Role and User Account :

We map this relationship by adding a Foreign Key in User Account which references the Primary Key of User Role.
Here, the Foreign Key is roleName which references roleName in User Role.

1:N Relationship for User Account and Relation-Privilege :

We map this relationship by adding a Foreign Key in Relation-Privilege which references the Primary Key of User Account.
Here, the Foreign Key is grantorID which references userID in User Role.

1:N Relationship for User Role and Account Privilege :

We map this relationship by adding a Foreign Key in Account -Privilege which references the Primary Key of User Role.
Here, the Foreign Key is roleName which references roleName in User Role.

Mapping of Ternary Relationships

For mapping a ternary relation where n>2, we create a new relationship relation to represent the ternary relation. For our EER Mapping, we have a Ternary Relation between User Role, DBTable and Relation Privilege. To represent this relation in a Relational Schema, we create a new relationship relation "Has Access" which contains as Foreign Key, the primary keys of all the participating entities.

That is, Has Access has foreign key :

1. tableName – which references the primary key of DBTable
2. roleName – which references the primary key of User Role
3. pid – which references the primary key of Relation Privilege

Mapping of Specialization of Classes

For mapping of class specializations, we create a new relation for the Super Class with its simple attributes and its primary key. For the subclasses, we also create a new relation where the subclasses have the primary of their parent class. For our EER Diagram, Privilege has a specialization where Relation Privilege and Account Privilege are its sub classes. We Create a relation Privilege with pid as the primary key, and we then create relation Account Privilege and Relation Privilege which have as foreign key, pid, which refers to the primary key of parent class.

DDL

```
CREATE DATABASE SECURITY7;

USE SECURITY7;

CREATE TABLE user_accounts(
    userID INT NOT NULL auto_increment,
    phone varchar(12) NOT NULL DEFAULT 'NULL',
    userName varchar(100) NOT NULL UNIQUE ,
#     userRole varchar(100) NOT NULL DEFAULT 'staff',
    CONSTRAINT UAPK PRIMARY KEY (userID)
)ENGINE=InnoDB;

CREATE TABLE DbTable(
    tableName varchar(100) NOT NULL UNIQUE ,
    ownerID int NOT NULL,
    CONSTRAINT tpk PRIMARY KEY (tableName),
    CONSTRAINT tfk FOREIGN KEY (ownerID) REFERENCES user_accounts(userID)
        ON DELETE CASCADE
        ON UPDATE CASCADE
)ENGINE=InnoDB;

CREATE TABLE privileges(
    pid int NOT NULL ,
    privType varchar(100) NOT NULL,
    CONSTRAINT ppk PRIMARY KEY (pid),
    UNIQUE (privType)
)ENGINE=InnoDB;

CREATE TABLE user_role(
    roleName varchar(100) NOT NULL,
    description varchar(100),
    userID int NOT NULL DEFAULT 12,
    CONSTRAINT urpk PRIMARY KEY (roleName, userID),
    CONSTRAINT urfk FOREIGN KEY (userID) REFERENCES user_accounts(userID)
        ON DELETE CASCADE
        ON UPDATE CASCADE
)ENGINE=InnoDB;

CREATE TABLE account_privileges(
    pid int NOT NULL ,
    roleName varchar(100) NOT NULL ,
    CONSTRAINT appk PRIMARY KEY (pid, roleName),
    CONSTRAINT apfk1 FOREIGN KEY (pid) REFERENCES privileges(pid)
    ON DELETE CASCADE
    ON UPDATE CASCADE ,
    CONSTRAINT apfk2 FOREIGN KEY (roleName) REFERENCES user_role(roleName)
```

```
    ON DELETE CASCADE
    ON UPDATE CASCADE
)ENGINE=InnoDB;

CREATE TABLE relation_privileges(
    pid int NOT NULL ,
    tableName varchar(100) NOT NULL ,
    grantorID int NOT NULL ,
    CONSTRAINT rppk PRIMARY KEY (pid,tableName),
    CONSTRAINT rpfk1 FOREIGN KEY (pid) REFERENCES privileges (pid)
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    CONSTRAINT rpfk2 FOREIGN KEY (grantorID) REFERENCES
user_accounts(userID)
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    CONSTRAINT rpfk3 FOREIGN KEY (tableName) REFERENCES DbTable(tableName)
    ON DELETE CASCADE
    ON UPDATE CASCADE
)ENGINE=InnoDB;

CREATE TABLE has_access(
    pid int NOT NULL,
    tableName varchar(100) NOT NULL ,
    roleName varchar(100) NOT NULL ,
    grantorID int NOT NULL                ,
    CONSTRAINT hspk PRIMARY KEY (pid, roleName, tableName),
    CONSTRAINT hsfk1 FOREIGN KEY (pid) REFERENCES relation_privileges
(pid)
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    CONSTRAINT hsfk2 FOREIGN KEY (tableName) REFERENCES
relation_privileges (tableName)
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    CONSTRAINT hsfk3 FOREIGN KEY (grantorID) REFERENCES
relation_privileges (grantorID)
    ON DELETE CASCADE
    ON UPDATE CASCADE
)ENGINE=InnoDB;
```

Part3 Question2 Answers

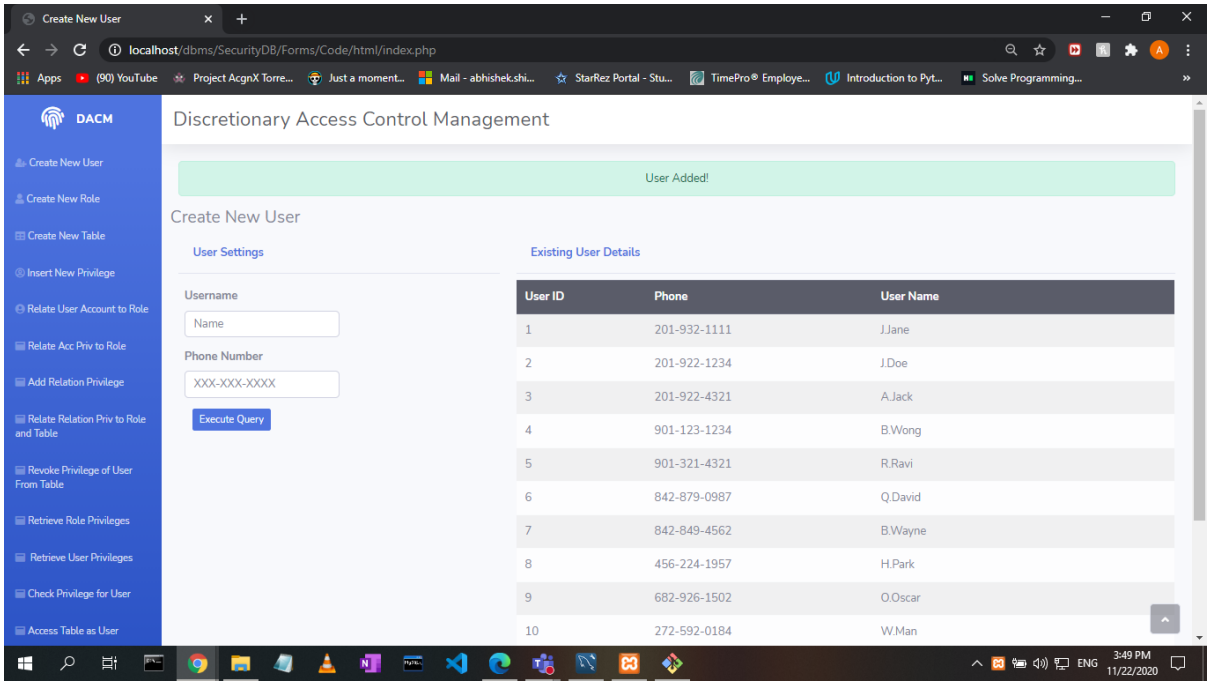
```
mysql> show tables;
+---------------------+
| Tables_in_SECURITY7 |
+---------------------+
| DbTable             |
| account_privileges  |
| all_user_priv       |
| has_access          |
| privileges          |
| relation_privileges |
| role_priv           |
| user_accounts       |
| user_priv_table     |
| user_role           |
+---------------------+
10 rows in set (0.09 sec)

mysql> #Account Privileges
mysql> SELECT pid AS PRIVILEGE_ID, roleName AS ROLE_NAME
    -> FROM SECURITY.account_privileges;
+--------------+-----------+
| PRIVILEGE_ID | ROLE_NAME |
+--------------+-----------+
|          100 | HR        |
|          101 | HR        |
|          102 | HR        |
|          103 | HR        |
|          103 | manager   |
|          103 | staff     |
|          104 | HR        |
|          104 | manager   |
|          105 | HR        |
|          105 | manager   |
|          106 | HR        |
|          106 | manager   |
|          106 | staff     |
+--------------+-----------+
13 rows in set (0.02 sec)

mysql>
mysql> #Tables
mysql> SELECT tableName AS TABLE_NAME, ownerID AS TABLE_OWNER_ID
    -> FROM SECURITY.DbTable;
+--------------+----------------+
| TABLE_NAME   | TABLE_OWNER_ID |
+--------------+----------------+
| hrTable      |              1 |
| managerTable |              2 |
| staffTable   |              3 |
+--------------+----------------+
3 rows in set (0.02 sec)

mysql>
```

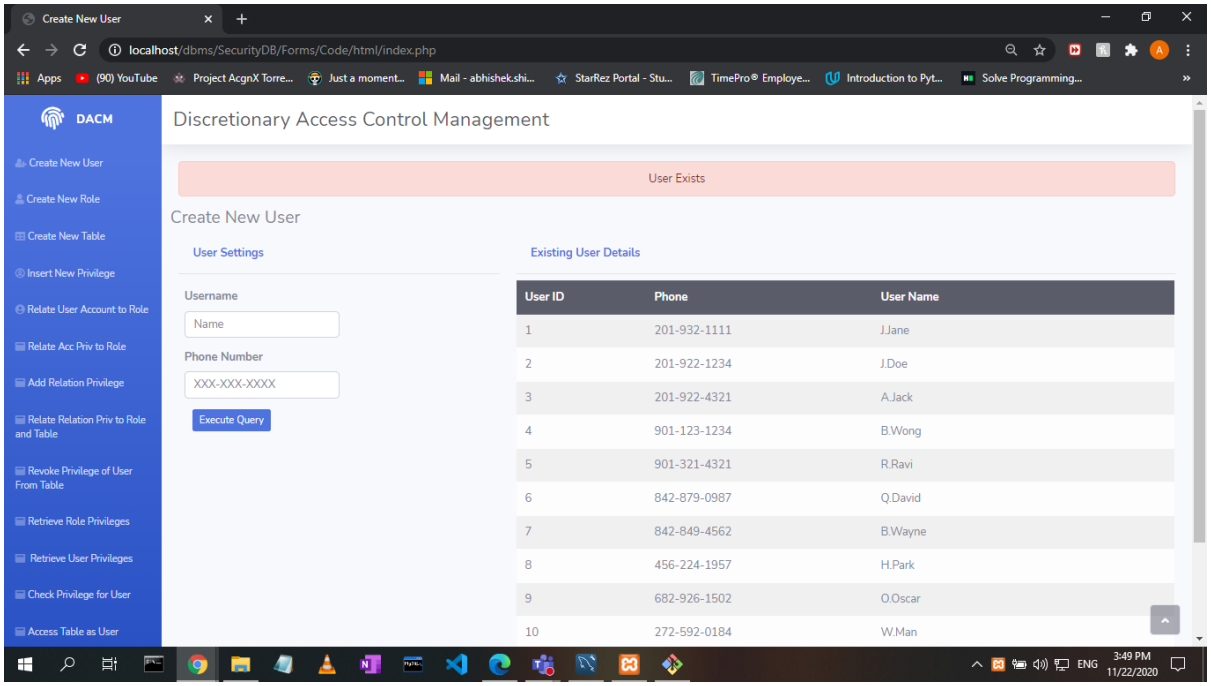
```
mysql> #Has Access
mysql> SELECT pid AS PRIVILEGE_ID, roleName AS ROLE_NAME, grantorID AS
GRANTOR_ID, tableName AS TABLE_NAME
    -> FROM SECURITY7.has_access;
+--------------+-----------+------------+------------+
| PRIVILEGE_ID | ROLE_NAME | GRANTOR_ID | TABLE_NAME |
+--------------+-----------+------------+------------+
|          106 | hr        |          1 | hrTable    |
+--------------+-----------+------------+------------+
1 row in set (0.02 sec)

mysql>
mysql> #Privileges
mysql> SELECT pid AS PRIVILEGE_ID, privType AS PRIVILEGE_NAME
    -> FROM SECURITY.privileges;
+--------------+----------------+
| PRIVILEGE_ID | PRIVILEGE_NAME |
+--------------+----------------+
|          100 | create         |
|          101 | drop           |
|          102 | alter          |
|          103 | insert         |
|          104 | delete         |
|          105 | update         |
|          106 | select         |
+--------------+----------------+
7 rows in set (0.02 sec)

mysql>
mysql>
mysql> #Relation Privileges
mysql> SELECT pid as Privilege_ID, tableName as Table_Name, grantorID as
Owner_ID FROM SECURITY7.relation_privileges;
+--------------+--------------+----------+
| Privilege_ID | Table_Name   | Owner_ID |
+--------------+--------------+----------+
|          106 | hrTable      |        1 |
|          106 | managerTable |        2 |
|          103 | staffTable   |        3 |
|          106 | staffTable   |        3 |
+--------------+--------------+----------+
4 rows in set (0.04 sec)

mysql>
mysql> #User Accounts
mysql> SELECT userID as User_ID, phone as Phone_Number, userName as
User_Name FROM SECURITY7.user_accounts;
+---------+--------------+-----------------------+
| User_ID | Phone_Number | User_Name             |
+---------+--------------+-----------------------+
|       1 | 201-932-1111 | J.Jane                |
|       2 | 201-922-1234 | J.Doe                 |
|       3 | 201-922-4321 | A.Jack                |
|       4 | 901-123-1234 | B.Wong                |
```

```
|       5 | 901-321-4321 | R.Ravi                |
|       6 | 842-879-0987 | Q.David               |
|       7 | 842-849-4562 | B.Wayne               |
|       8 | 456-224-1957 | H.Park                |
|       9 | 682-926-1502 | O.Oscar               |
|      10 | 272-592-0184 | W.Man                 |
|      11 | 837-238-0281 | S.Guy                 |
|      12 | XXX-XXX-XXXX | Default-User-For-Role |
+---------+--------------+-----------------------+
12 rows in set (0.03 sec)

mysql>
mysql> #User Roles
mysql> SELECT roleName as Role_Name, description as Description_Of_Role,
userID as User_ID FROM SECURITY7.user_role;
+-----------+---------------------+---------+
| Role_Name | Description_Of_Role | User_ID |
+-----------+---------------------+---------+
| clerk     | clerk role          |       3 |
| clerk     | clerk role          |       5 |
| hr        | human resource      |       1 |
| manager   | manager             |       2 |
| manager   | manager             |       6 |
| manager   | manager             |       7 |
| staff     | staffing            |       4 |
| staff     | staffing            |       8 |
| staff     | staffing            |       9 |
| staff     | staffing            |      10 |
| staff     | staffing            |      11 |
+-----------+---------------------+---------+
11 rows in set (0.02 sec)

mysql> notee
```

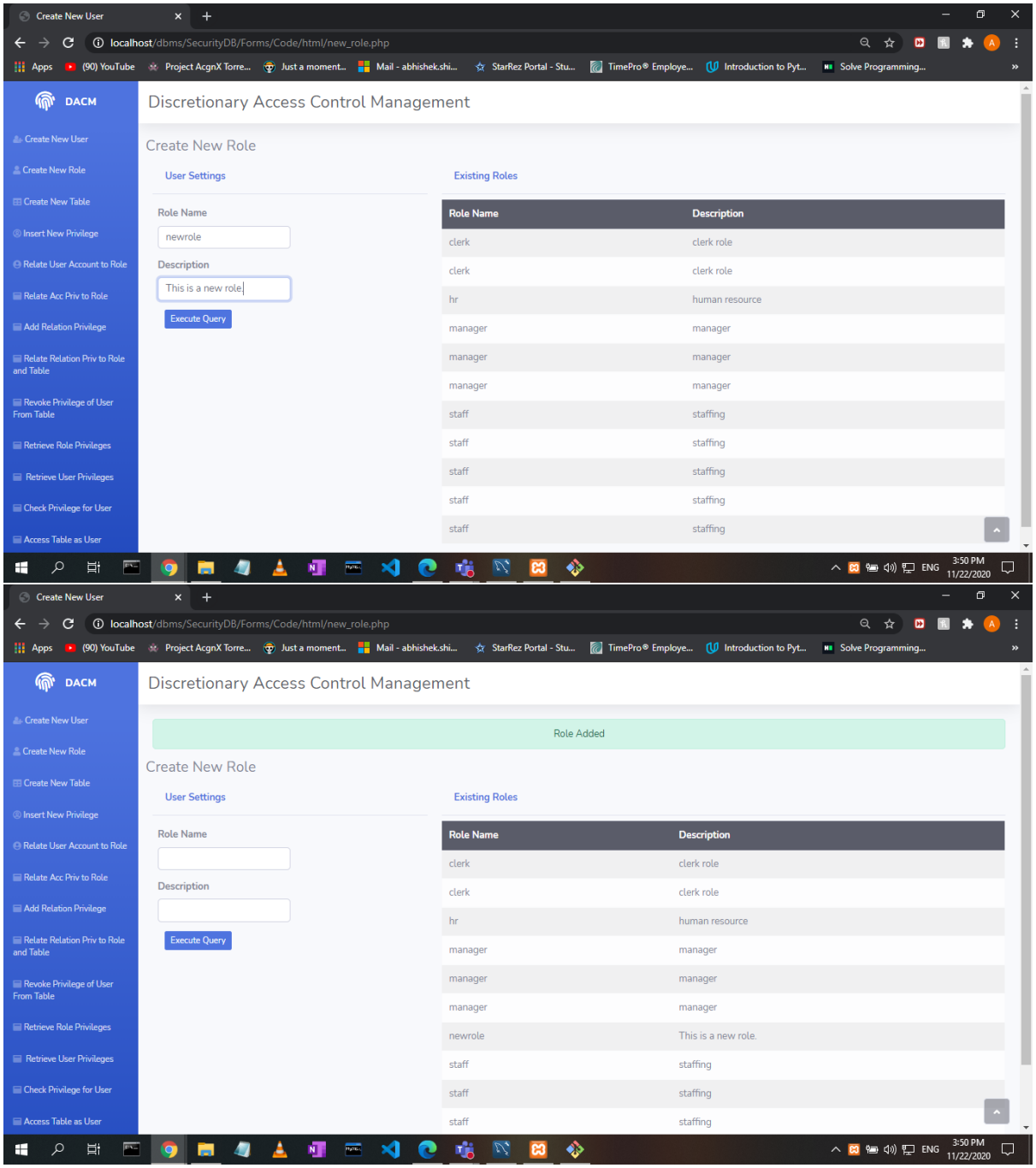
Screenshots for Part 3

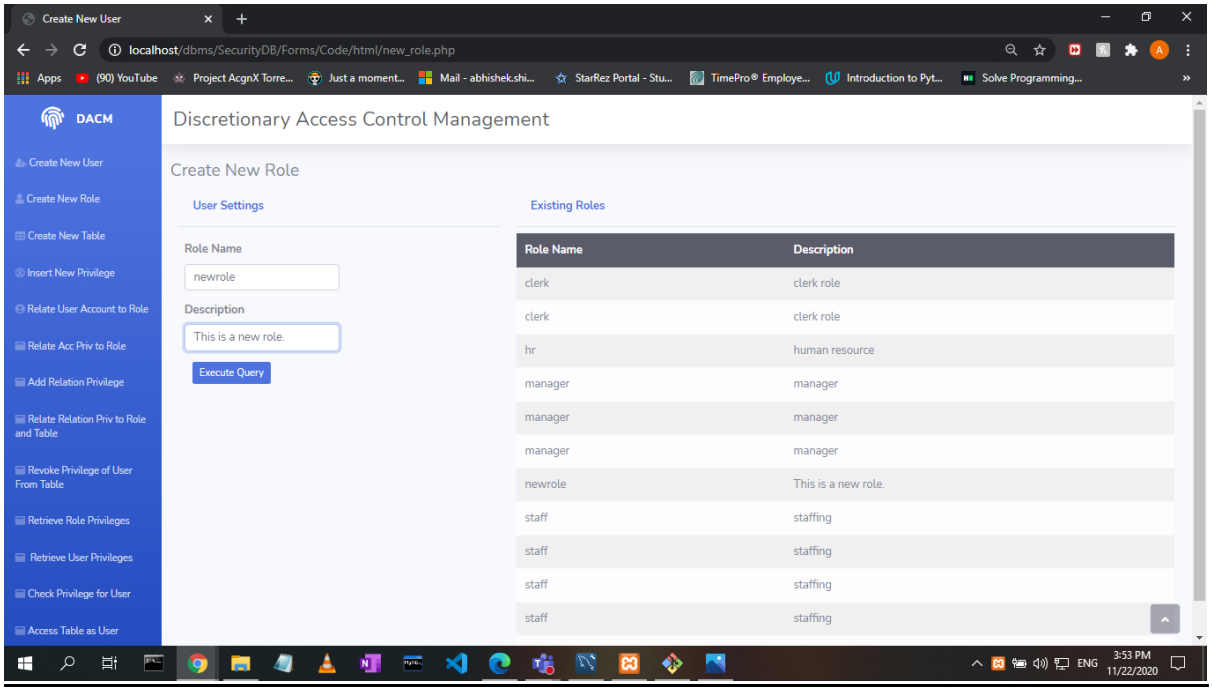
CREATE NEW USER

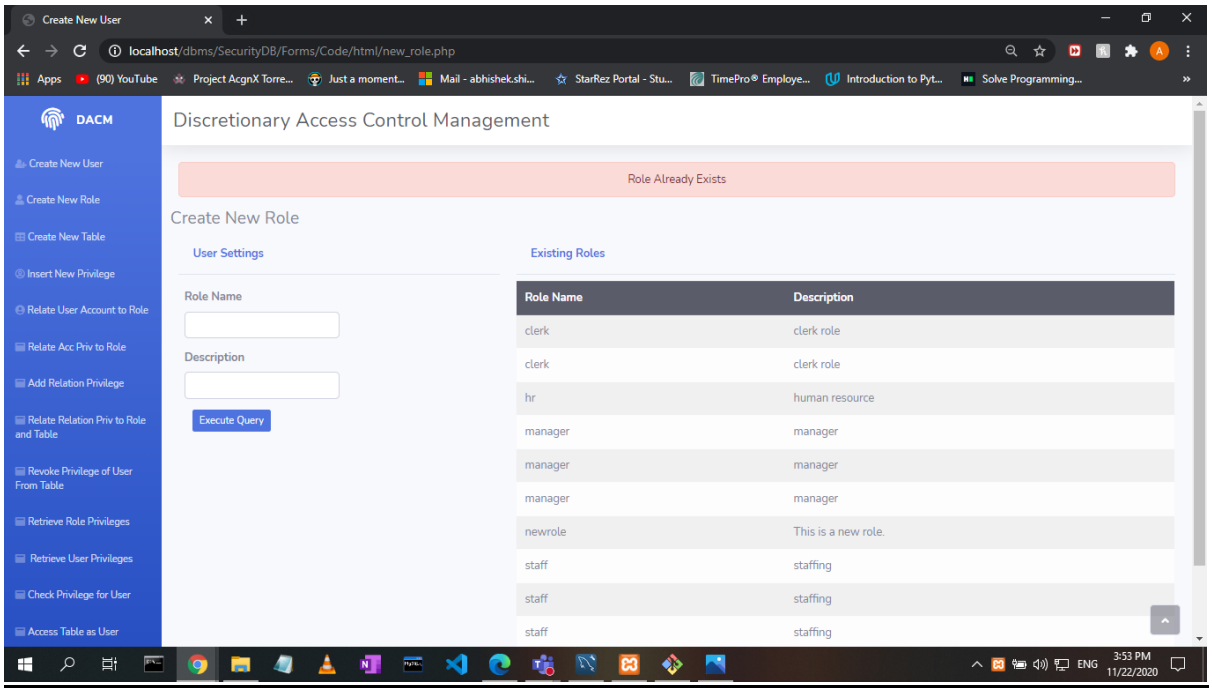




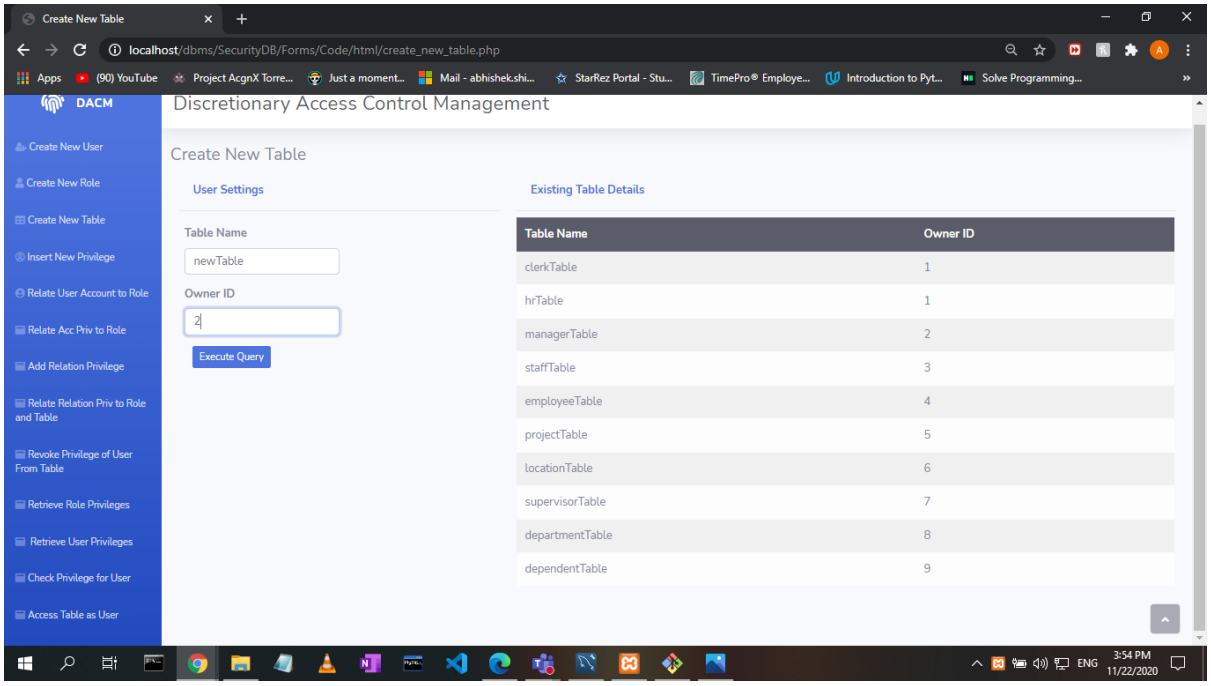
CREATE NEW ROLE

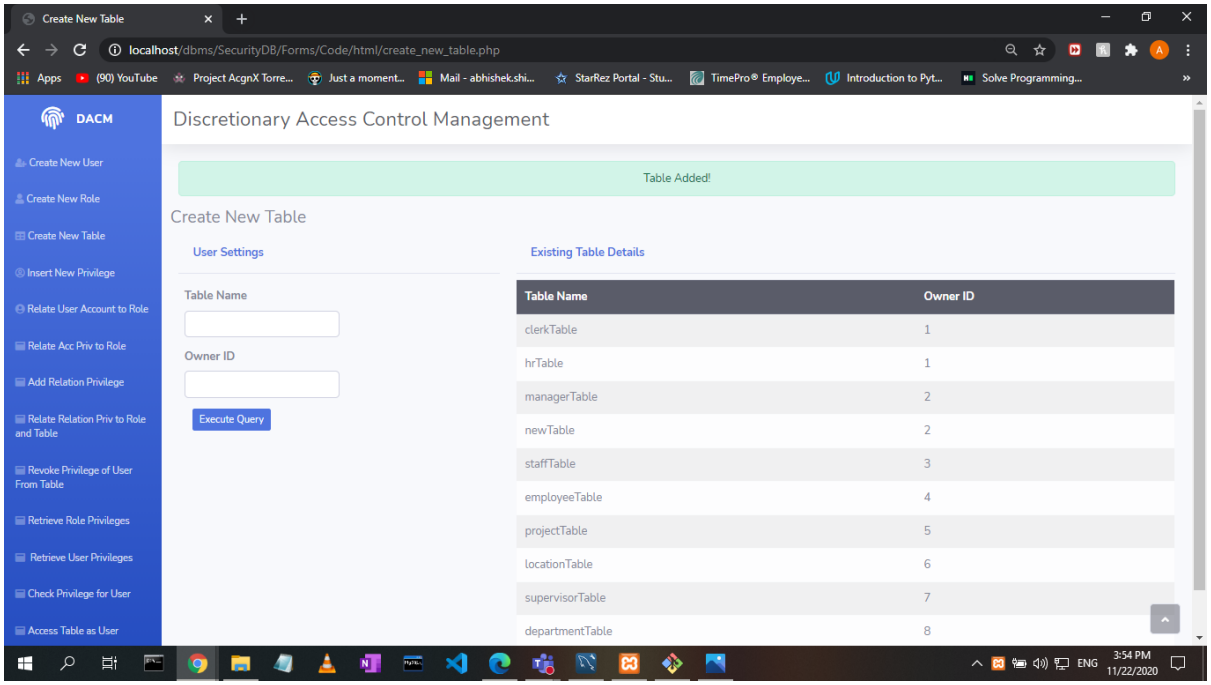


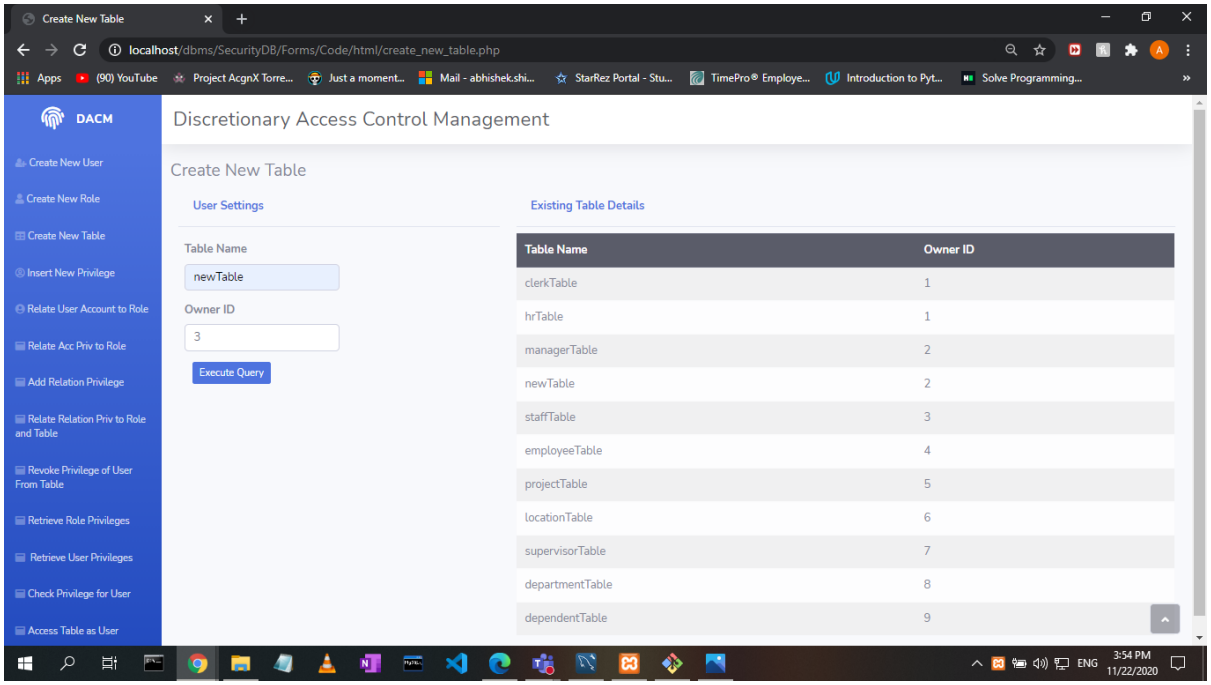

Create New User
localhost/dbms/SecurityDB/Forms/Code/html/new_role.php
DACM
Discretionary Access Control Management
Create New Role
User Settings
Existing Roles
Role Name
newrole
Description
This is a new role.
Execute Query
Role Name
Description
clerk
clerk role
clerk
clerk role
hr
human resource
manager
manager
manager
manager
manager
manager
newrole
This is a new role.
staff
staffing
staff
staffing
staff
staffing
staff
staffing

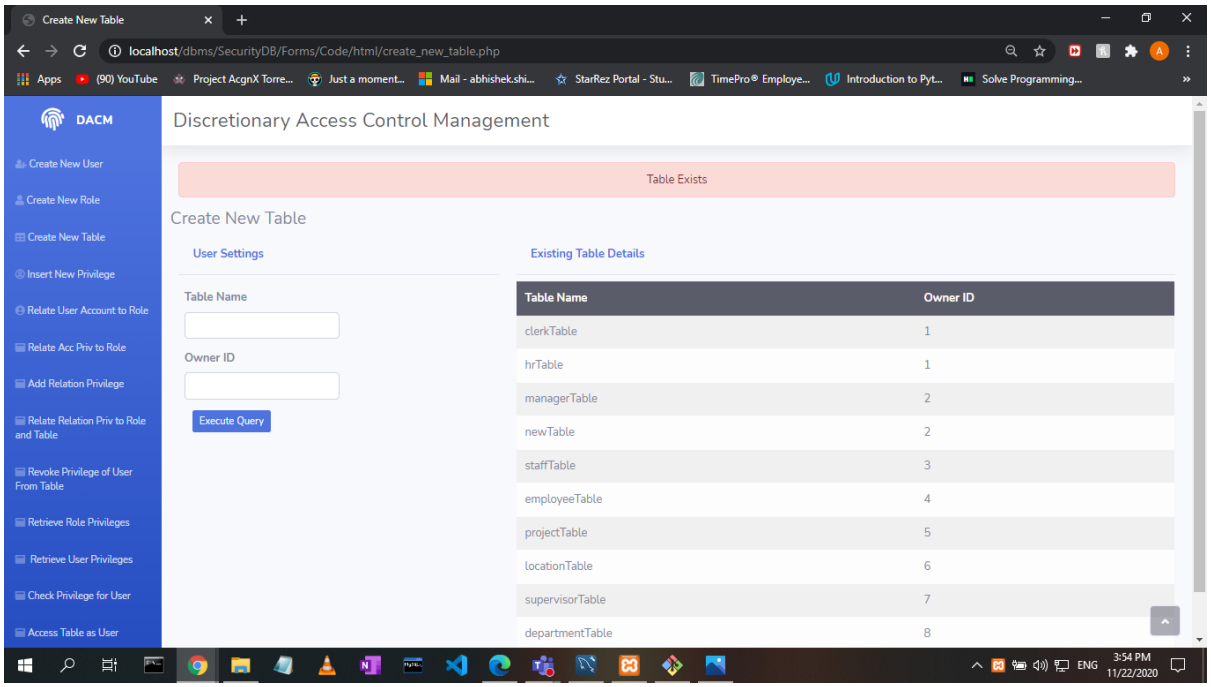

Create New User
localhost/dbms/SecurityDB/Forms/Code/html/new_role.php
DACM
Discretionary Access Control Management
Role Already Exists
Create New Role
User Settings
Existing Roles
Role Name
Description
Execute Query
Role Name
Description
clerk
clerk role
clerk
clerk role
hr
human resource
manager
manager
manager
manager
manager
manager
newrole
This is a new role.
staff
staffing
staff
staffing
staff
staffing

CREATE NEW TABLE

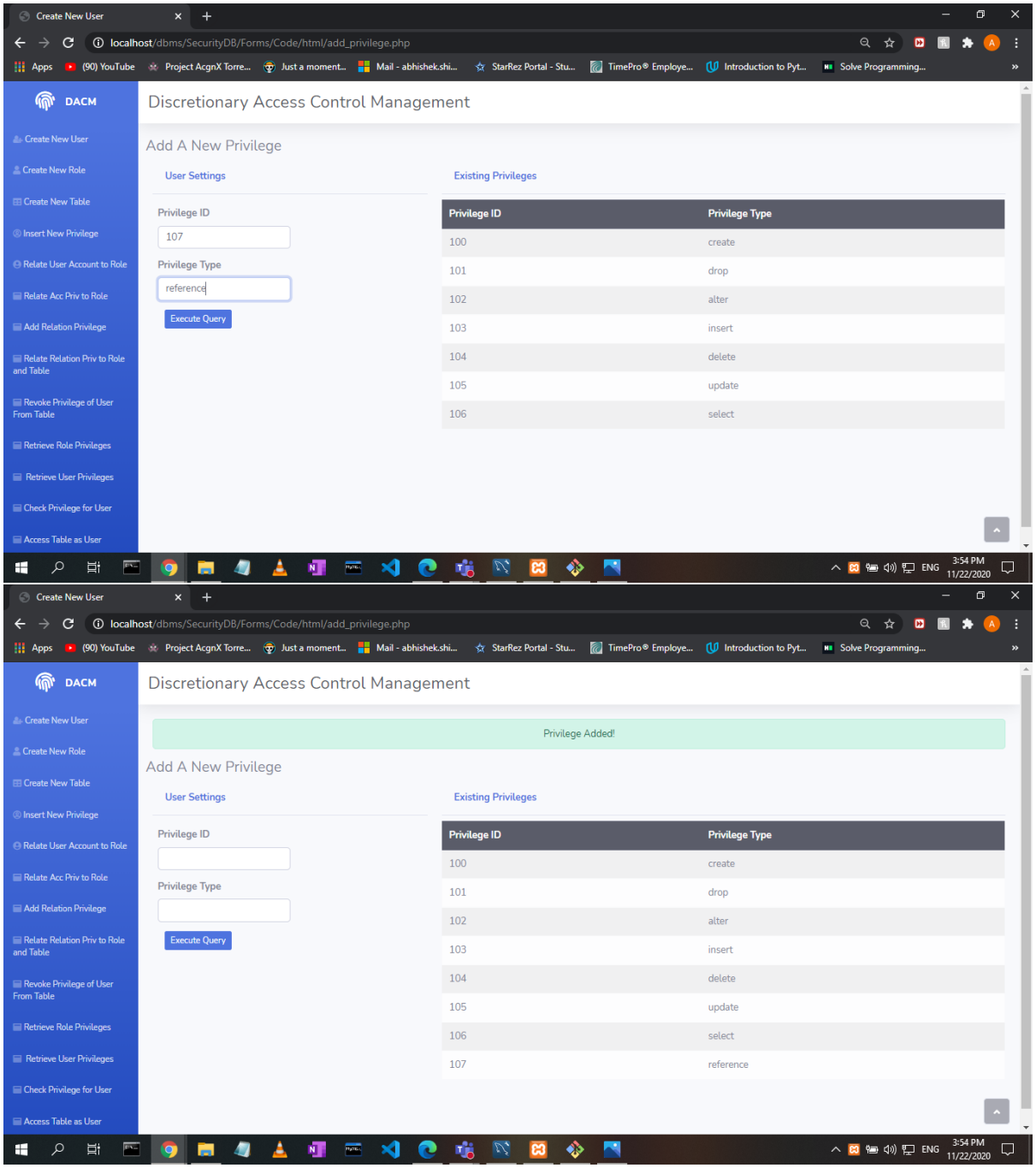


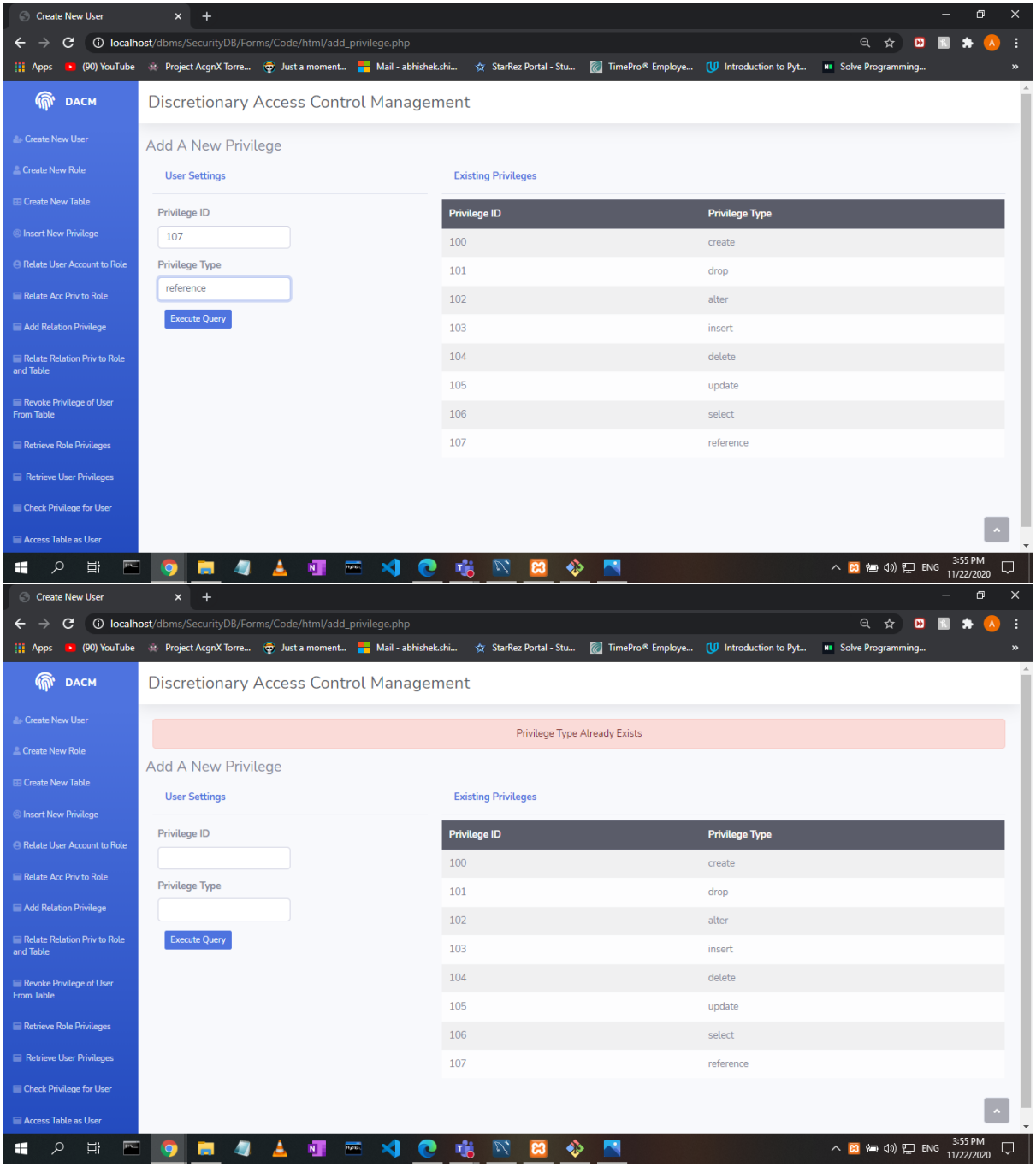



Create New Table
localhost/dbms/SecurityDB/Forms/Code/html/create_new_table.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Create New Table
User Settings
Table Name
newTable
Owner ID
3
Execute Query
Existing Table Details
Table Name
Owner ID
clerkTable 1
hrTable 1
managerTable 2
newTable 2
staffTable 3
employeeTable 4
projectTable 5
locationTable 6
supervisorTable 7
departmentTable 8
dependentTable 9
ENG
3:54 PM
11/22/2020


Create New Table
localhost/dbms/SecurityDB/Forms/Code/html/create_new_table.php
DACM
Discretionary Access Control Management
Table Exists
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Create New Table
User Settings
Table Name
Owner ID
Execute Query
Existing Table Details
Table Name
Owner ID
clerkTable 1
hrTable 1
managerTable 2
newTable 2
staffTable 3
employeeTable 4
projectTable 5
locationTable 6
supervisorTable 7
departmentTable 8
ENG
3:54 PM
11/22/2020

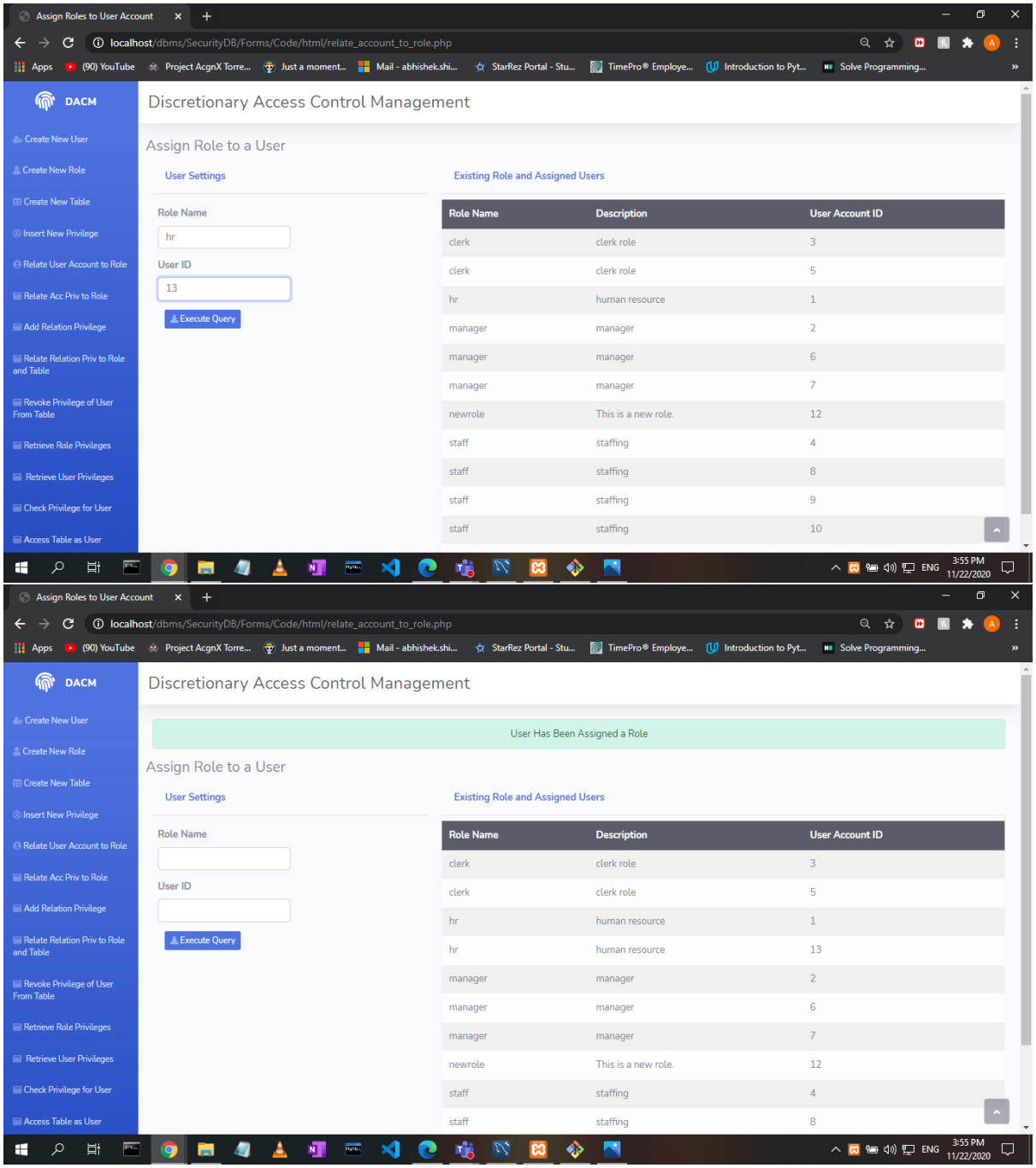
ADD NEW PRIVILEGE

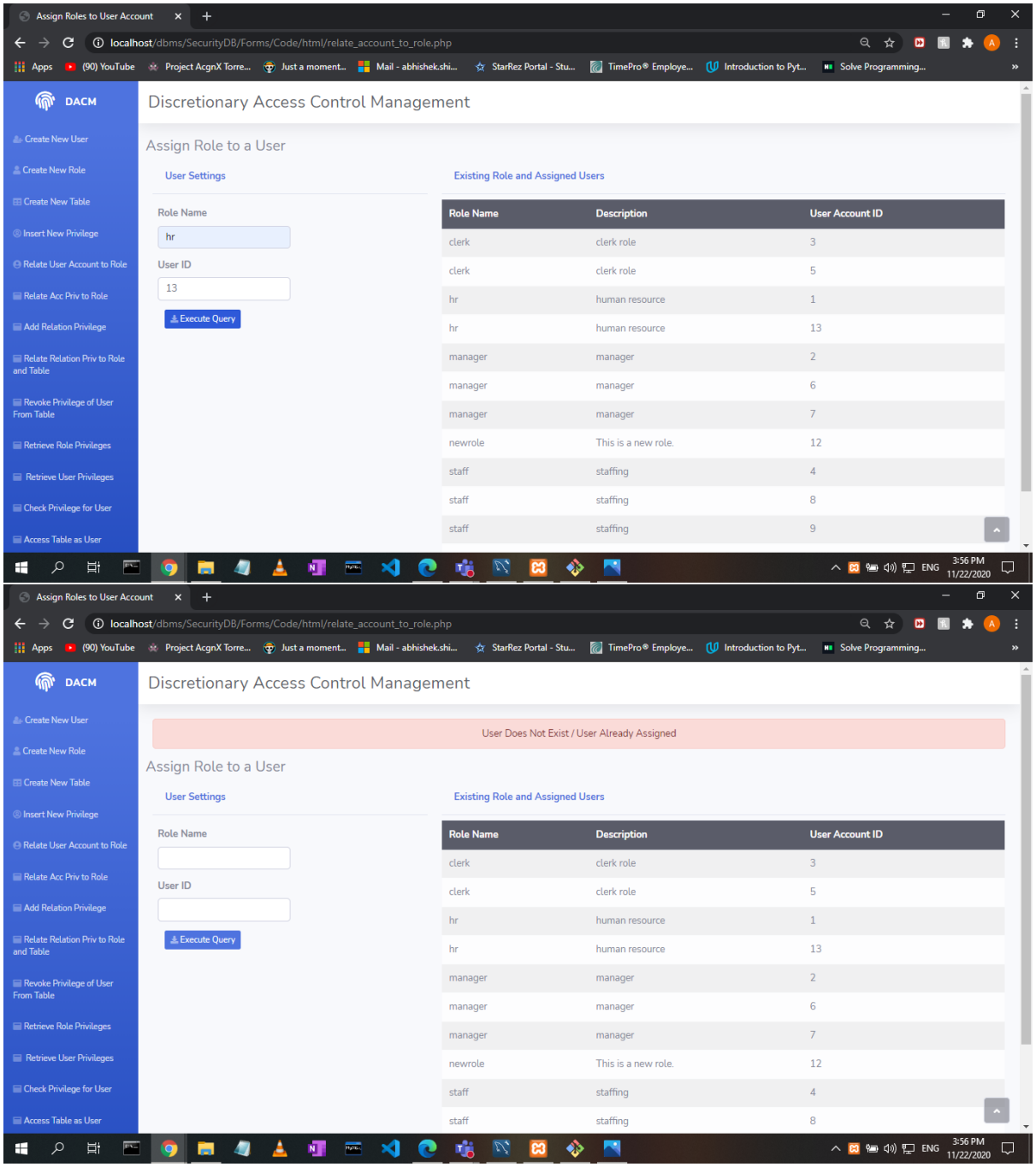



Create New User
localhost/dbms/SecurityDB/Forms/Code/html/add_privilege.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Add A New Privilege
User Settings
Existing Privileges
Privilege ID
107
Privilege Type
reference
Execute Query
Privilege ID
Privilege Type
100 create
101 drop
102 alter
103 insert
104 delete
105 update
106 select
107 reference
ENG
3:55 PM
11/22/2020

Create New User
localhost/dbms/SecurityDB/Forms/Code/html/add_privilege.php
DACM
Discretionary Access Control Management
Privilege Type Already Exists
Add A New Privilege
User Settings
Existing Privileges
Privilege ID
Privilege Type
Execute Query
Privilege ID
Privilege Type
100 create
101 drop
102 alter
103 insert
104 delete
105 update
106 select
107 reference
ENG
3:55 PM
11/22/2020

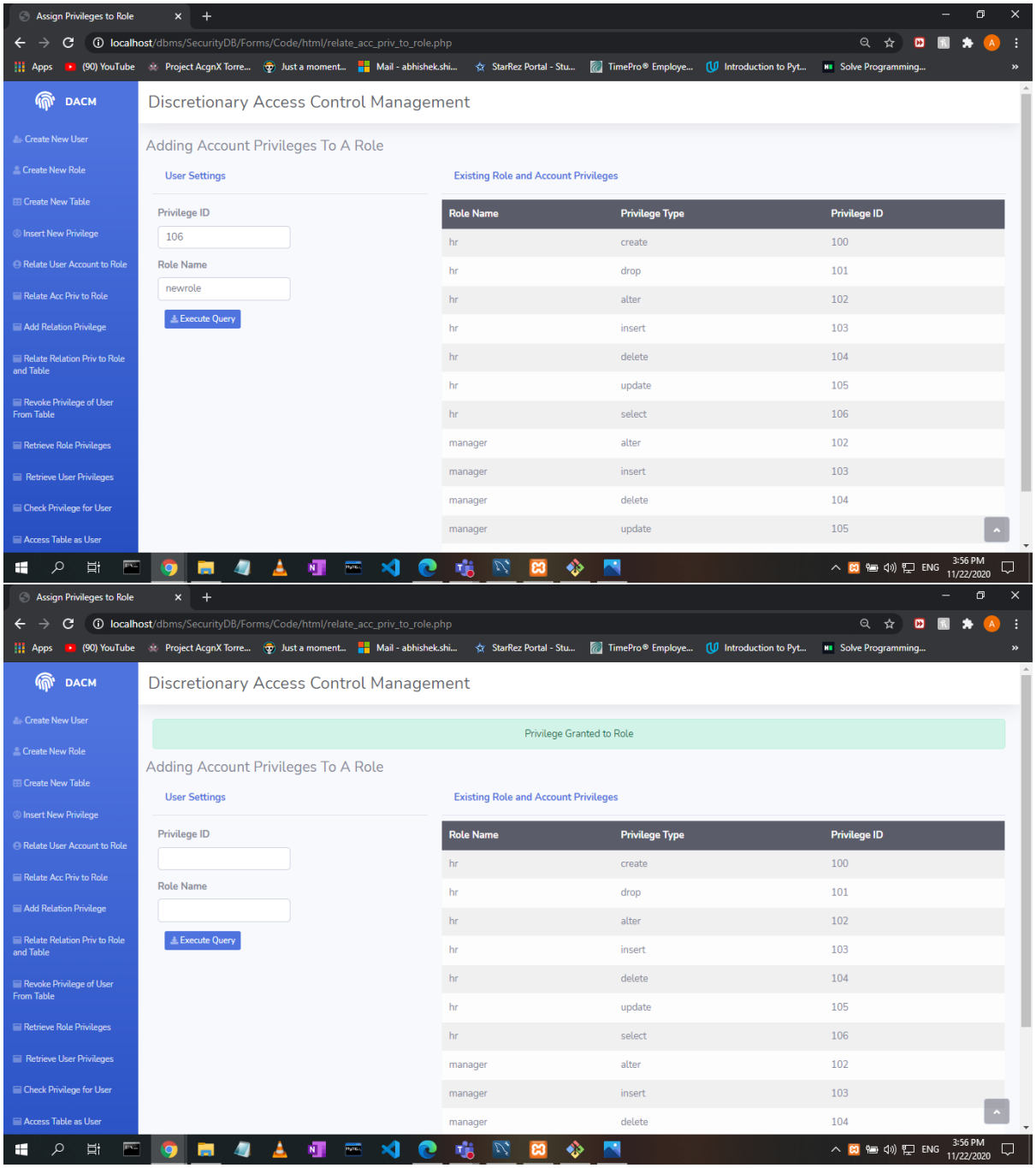
RELATE USER ACCOUNT TO ROLE

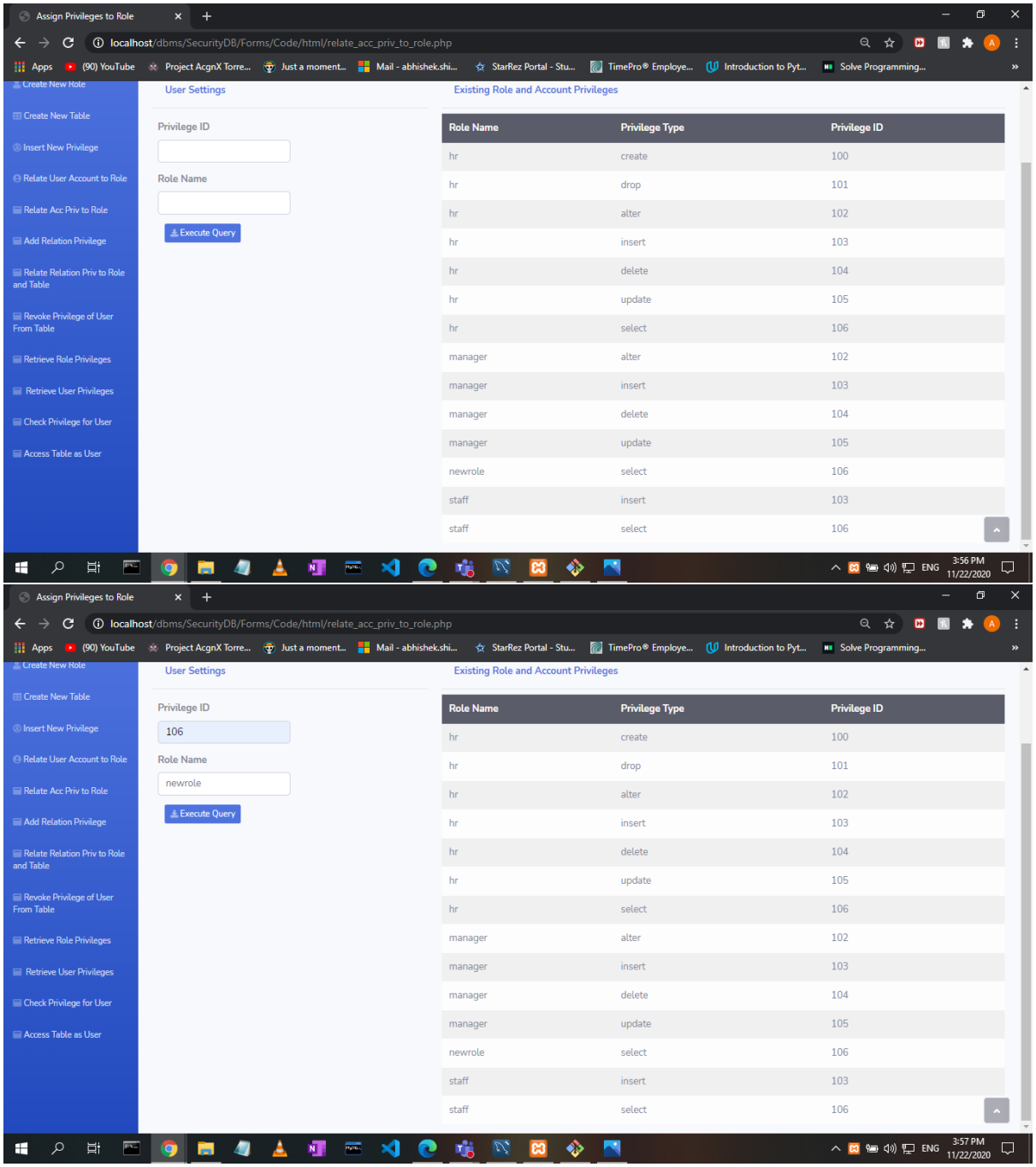



Assign Roles to User Account
localhost/dbms/SecurityDB/Forms/Code/html/relate_account_to_role.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Assign Role to a User
User Settings
Role Name
hr
User ID
13
Execute Query
Existing Role and Assigned Users
Role Name | Description | User Account ID
clerk | clerk role | 3
clerk | clerk role | 5
hr | human resource | 1
hr | human resource | 13
manager | manager | 2
manager | manager | 6
manager | manager | 7
newrole | This is a new role. | 12
staff | staffing | 4
staff | staffing | 8
staff | staffing | 9
3:56 PM
11/22/2020

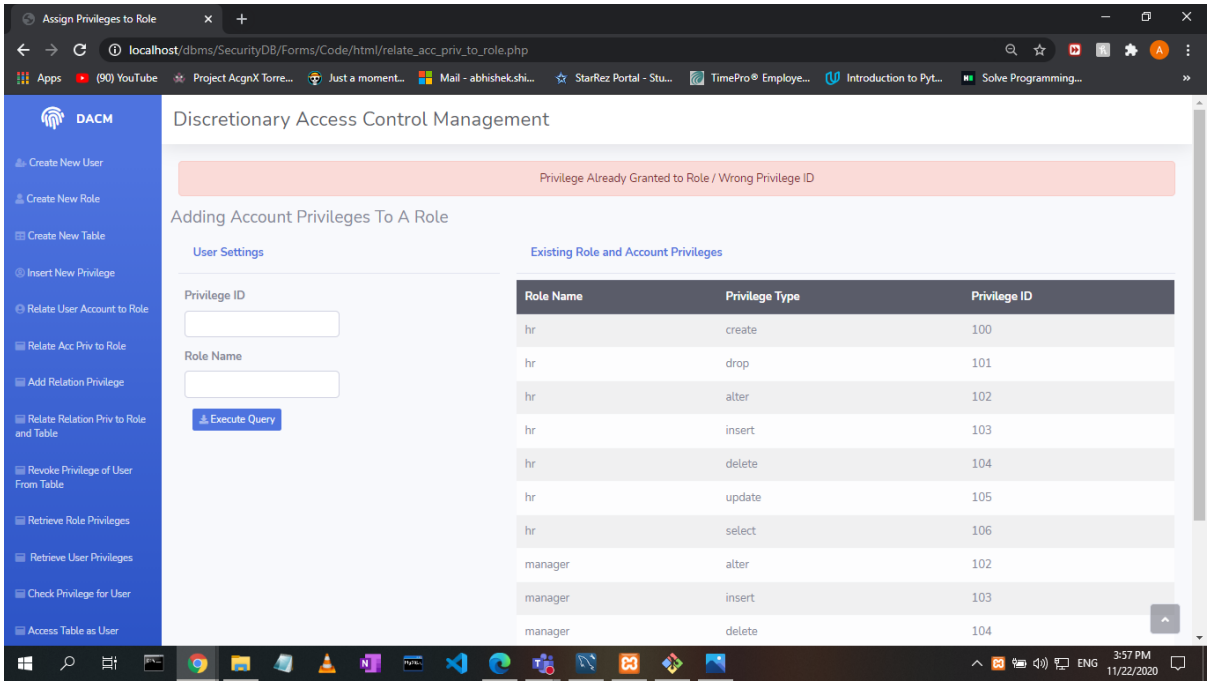
Assign Roles to User Account
localhost/dbms/SecurityDB/Forms/Code/html/relate_account_to_role.php
DACM
Discretionary Access Control Management
User Does Not Exist / User Already Assigned
Assign Role to a User
User Settings
Role Name
User ID
Execute Query
Existing Role and Assigned Users
Role Name | Description | User Account ID
clerk | clerk role | 3
clerk | clerk role | 5
hr | human resource | 1
hr | human resource | 13
manager | manager | 2
manager | manager | 6
manager | manager | 7
newrole | This is a new role. | 12
staff | staffing | 4
staff | staffing | 8
3:56 PM
11/22/2020

RELATE ACCOUNT PRIVILEGE TO ROLE

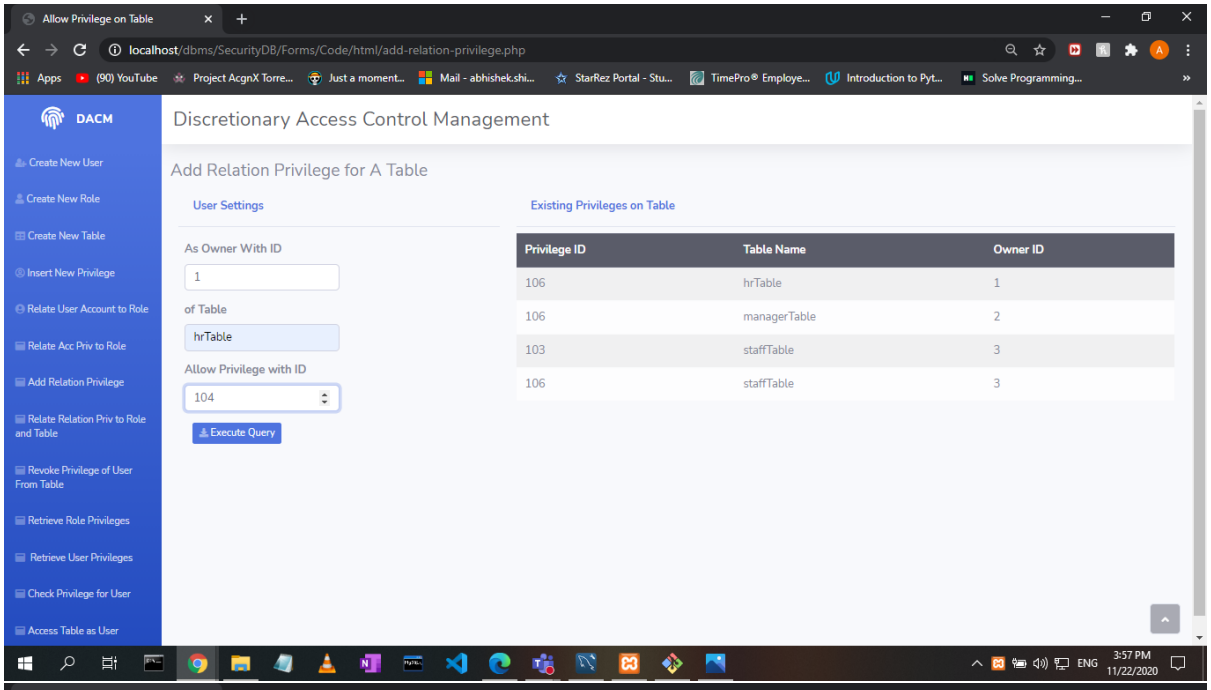


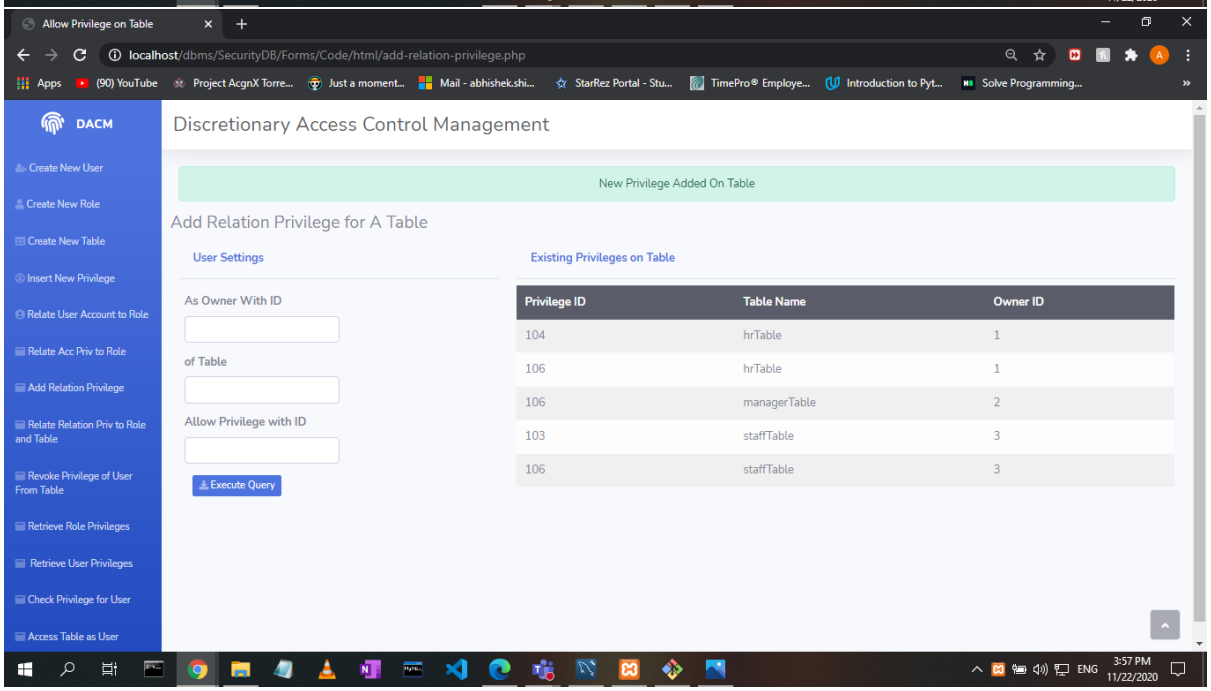

Assign Privileges to Role
localhost/dbms/SecurityDB/Forms/Code/html/relate_acc_priv_to_role.php
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
User Settings
Privilege ID
Role Name
Execute Query
Existing Role and Account Privileges
Role Name | Privilege Type | Privilege ID
hr | create | 100
hr | drop | 101
hr | alter | 102
hr | insert | 103
hr | delete | 104
hr | update | 105
hr | select | 106
manager | alter | 102
manager | insert | 103
manager | delete | 104
manager | update | 105
newrole | select | 106
staff | insert | 103
staff | select | 106
3:56 PM
11/22/2020

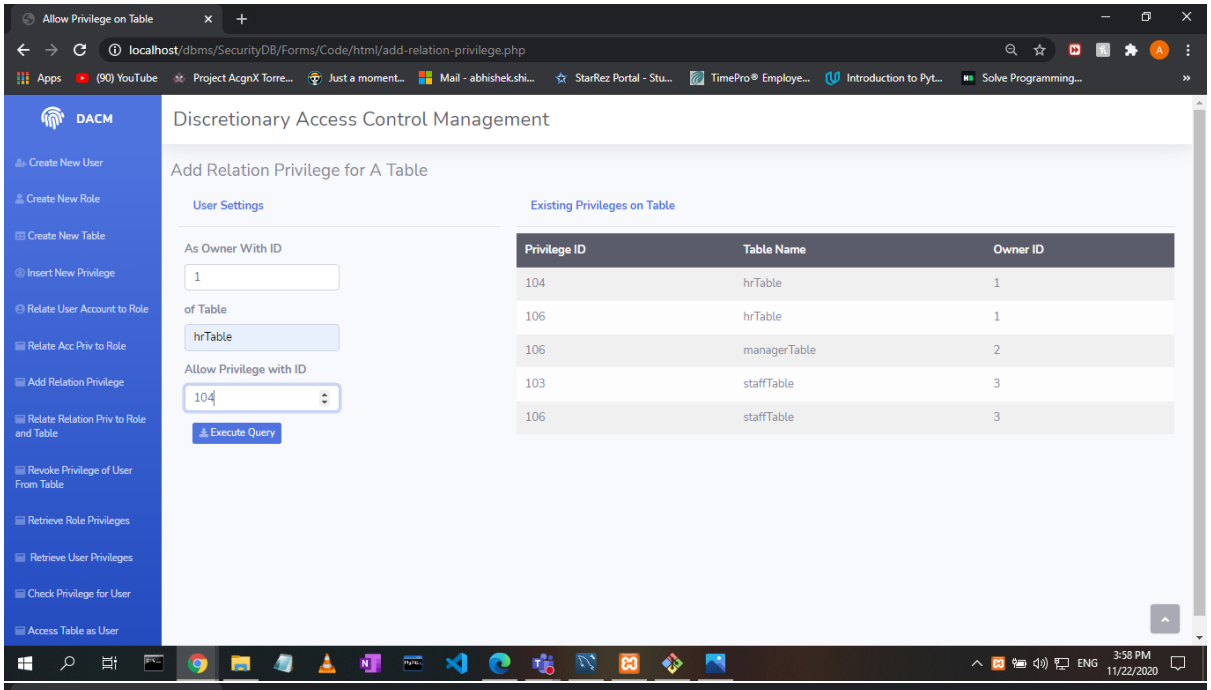
Assign Privileges to Role
localhost/dbms/SecurityDB/Forms/Code/html/relate_acc_priv_to_role.php
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
User Settings
Privilege ID
106
Role Name
newrole
Execute Query
Existing Role and Account Privileges
Role Name | Privilege Type | Privilege ID
hr | create | 100
hr | drop | 101
hr | alter | 102
hr | insert | 103
hr | delete | 104
hr | update | 105
hr | select | 106
manager | alter | 102
manager | insert | 103
manager | delete | 104
manager | update | 105
newrole | select | 106
staff | insert | 103
staff | select | 106
3:57 PM
11/22/2020

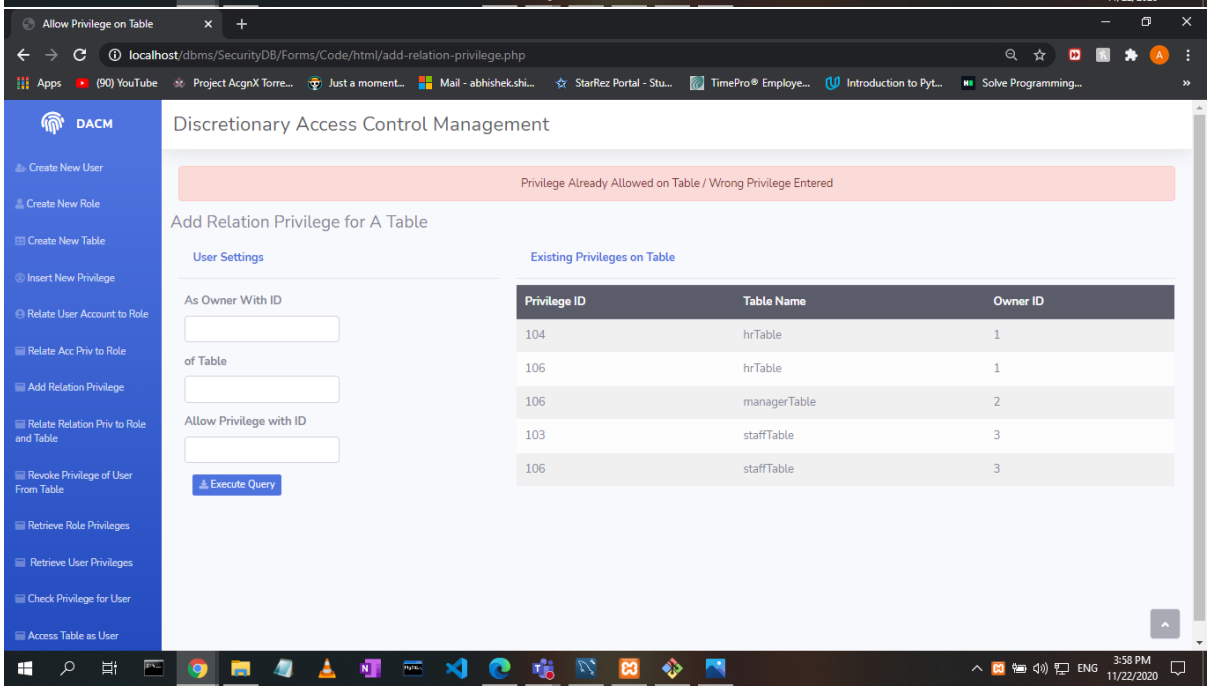

Assign Privileges to Role
localhost/dbms/SecurityDB/Forms/Code/html/relate_acc_priv_to_role.php
Apps
(90) YouTube
Project AcgnX Torre...
Just a moment...
Mail - abhishek.shi...
StarRez Portal - Stu...
TimePro® Employe...
Introduction to Pyt...
Solve Programming...
DACM
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Discretionary Access Control Management
Privilege Already Granted to Role / Wrong Privilege ID
Adding Account Privileges To A Role
User Settings
Privilege ID
Role Name
Execute Query
Existing Role and Account Privileges
Role Name
Privilege Type
Privilege ID
hr create 100
hr drop 101
hr alter 102
hr insert 103
hr delete 104
hr update 105
hr select 106
manager alter 102
manager insert 103
manager delete 104
ENG
3:57 PM
11/22/2020

ADD RELATION PRIVILEGE FOR A TABLE

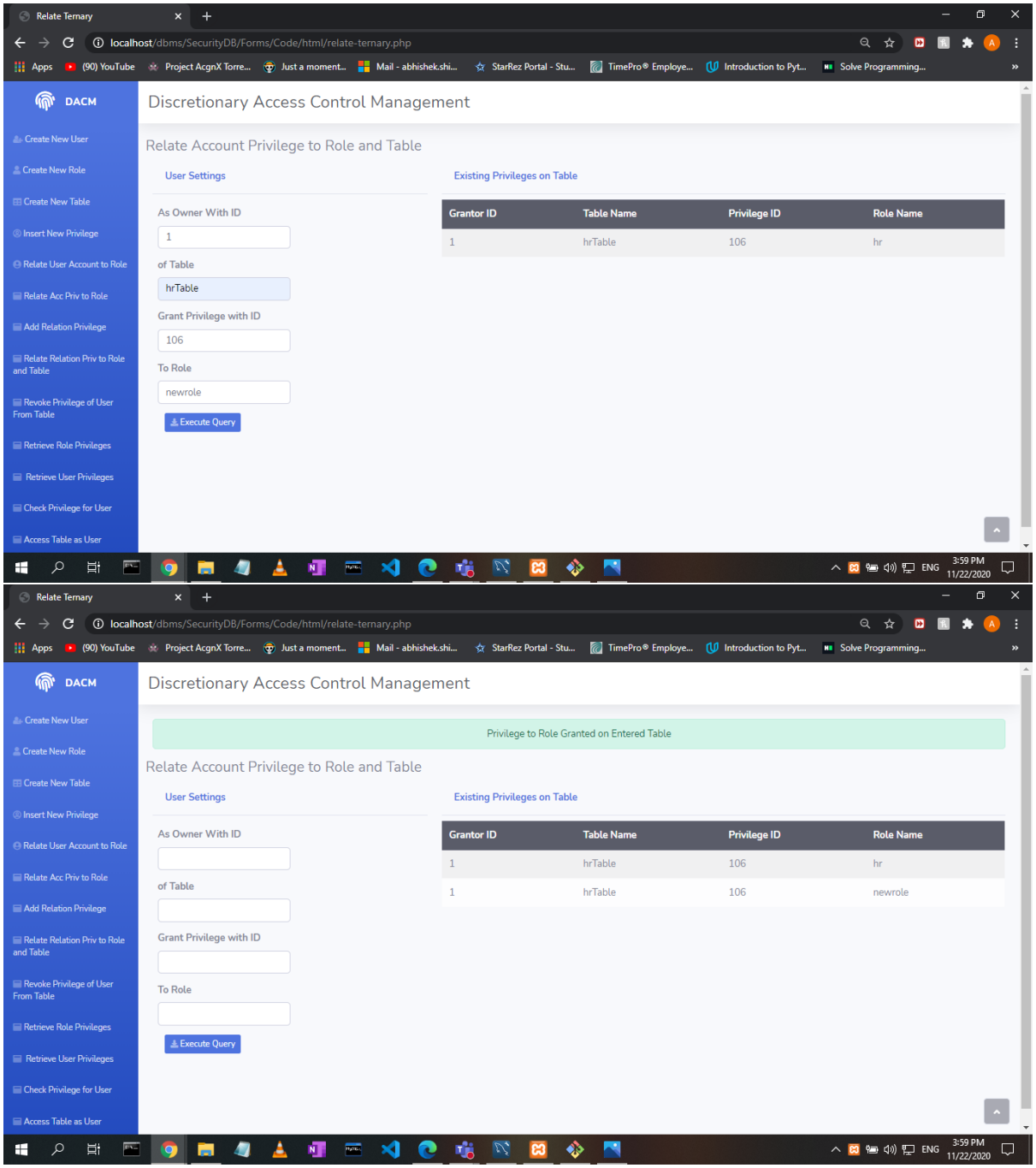


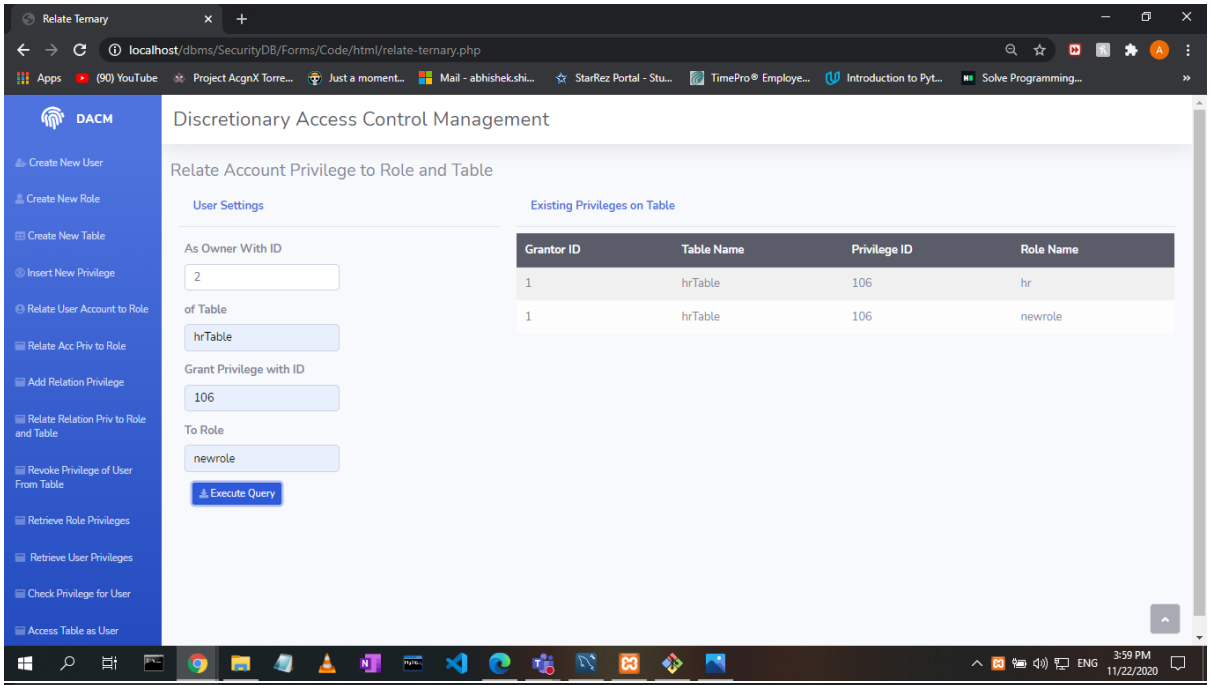


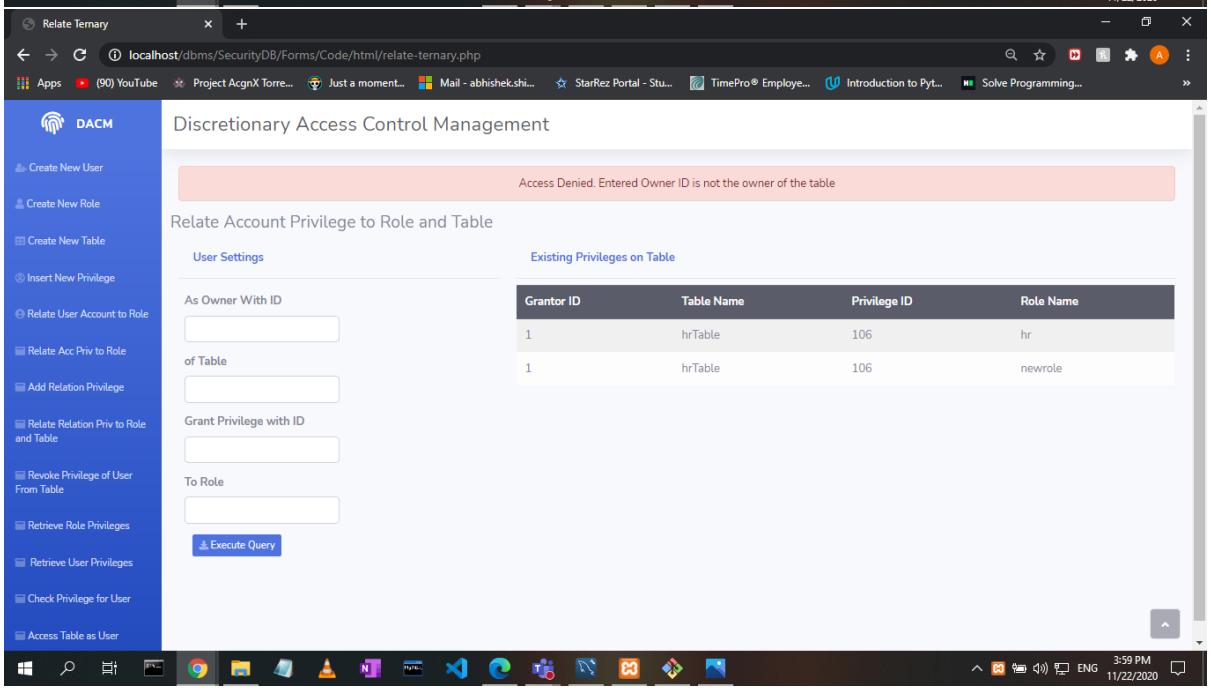

Allow Privilege on Table
localhost/dbms/SecurityDB/Forms/Code/html/add-relation-privilege.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Add Relation Privilege for A Table
User Settings
As Owner With ID
1
of Table
hrTable
Allow Privilege with ID
104
Execute Query
Existing Privileges on Table
Privilege ID
Table Name
Owner ID
104 hrTable 1
106 hrTable 1
106 managerTable 2
103 staffTable 3
106 staffTable 3
ENG
3:58 PM
11/22/2020

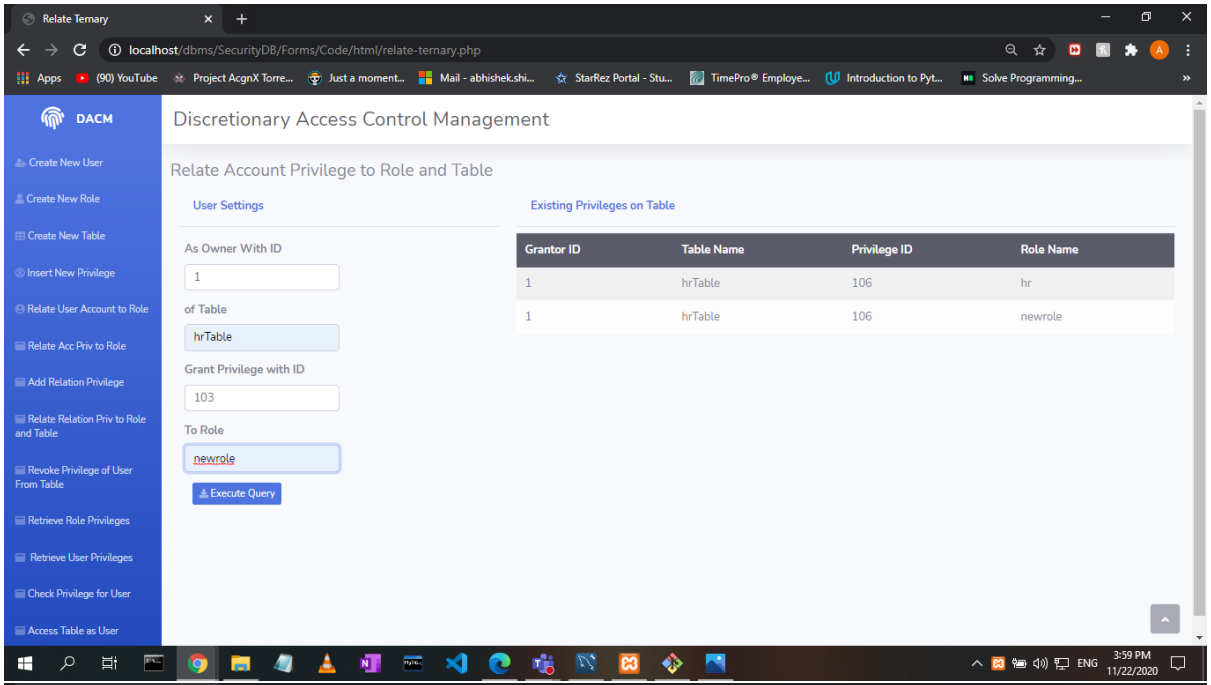

Allow Privilege on Table
localhost/dbms/SecurityDB/Forms/Code/html/add-relation-privilege.php
DACM
Discretionary Access Control Management
Privilege Already Allowed on Table / Wrong Privilege Entered
Add Relation Privilege for A Table
User Settings
As Owner With ID
of Table
Allow Privilege with ID
Execute Query
Existing Privileges on Table
Privilege ID
Table Name
Owner ID
104 hrTable 1
106 hrTable 1
106 managerTable 2
103 staffTable 3
106 staffTable 3
ENG
3:58 PM
11/22/2020

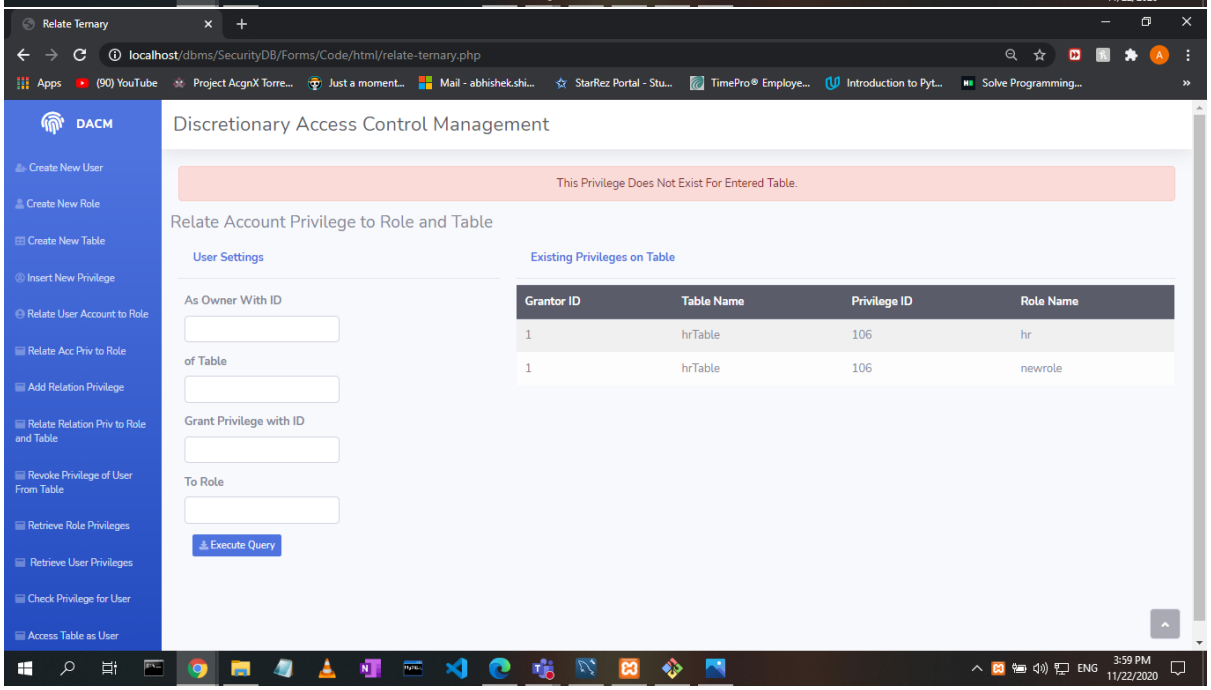
RELATE RELATION PRIVILEGE TO ROLE ON TABLE



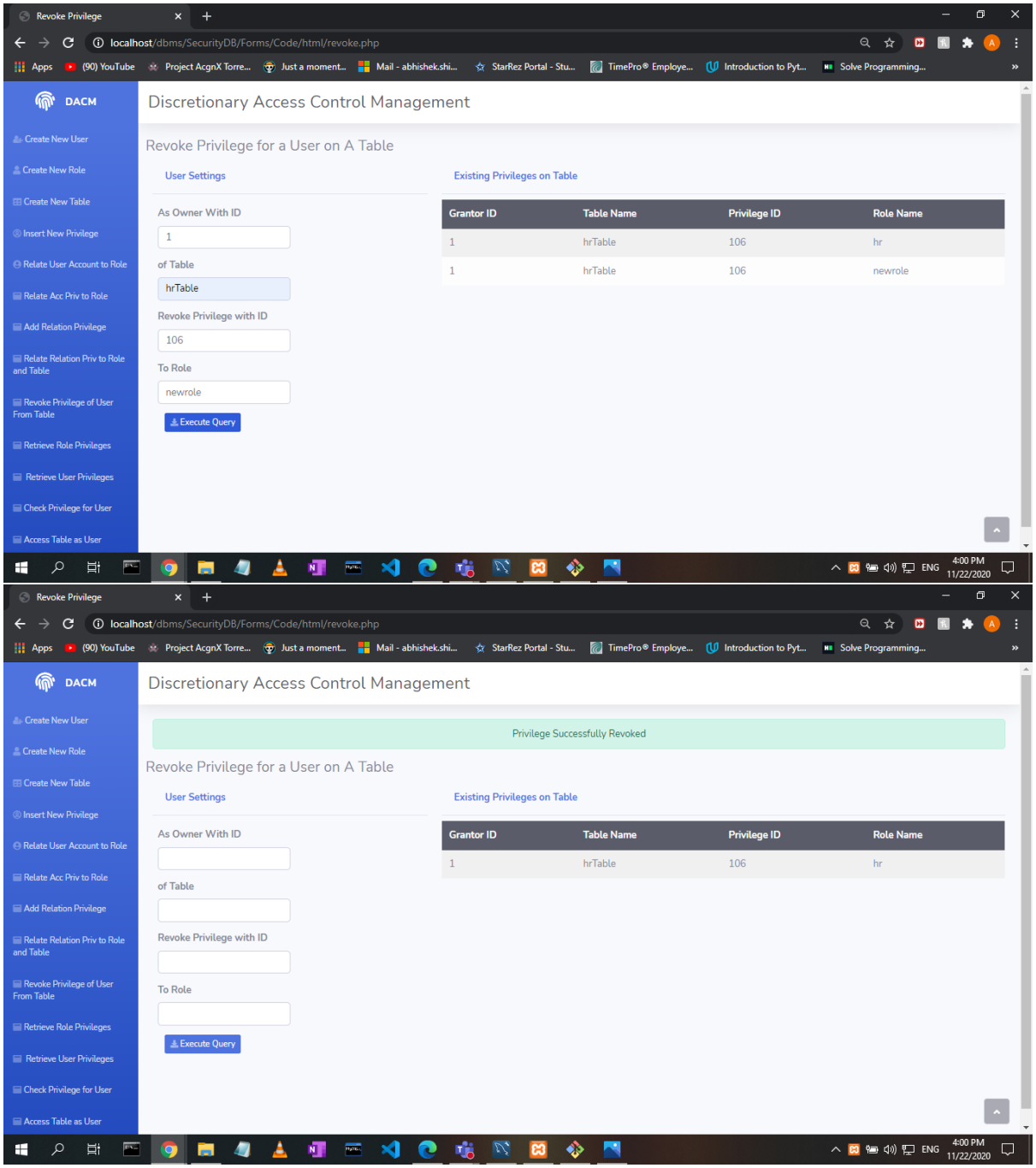

Relate Ternary
localhost/dbms/SecurityDB/Forms/Code/html/relate-ternary.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Relate Account Privilege to Role and Table
User Settings
As Owner With ID
2
of Table
hrTable
Grant Privilege with ID
106
To Role
newrole
Execute Query
Existing Privileges on Table
Grantor ID
Table Name
Privilege ID
Role Name
1
hrTable
106
hr
1
hrTable
106
newrole
ENG
3:59 PM
11/22/2020

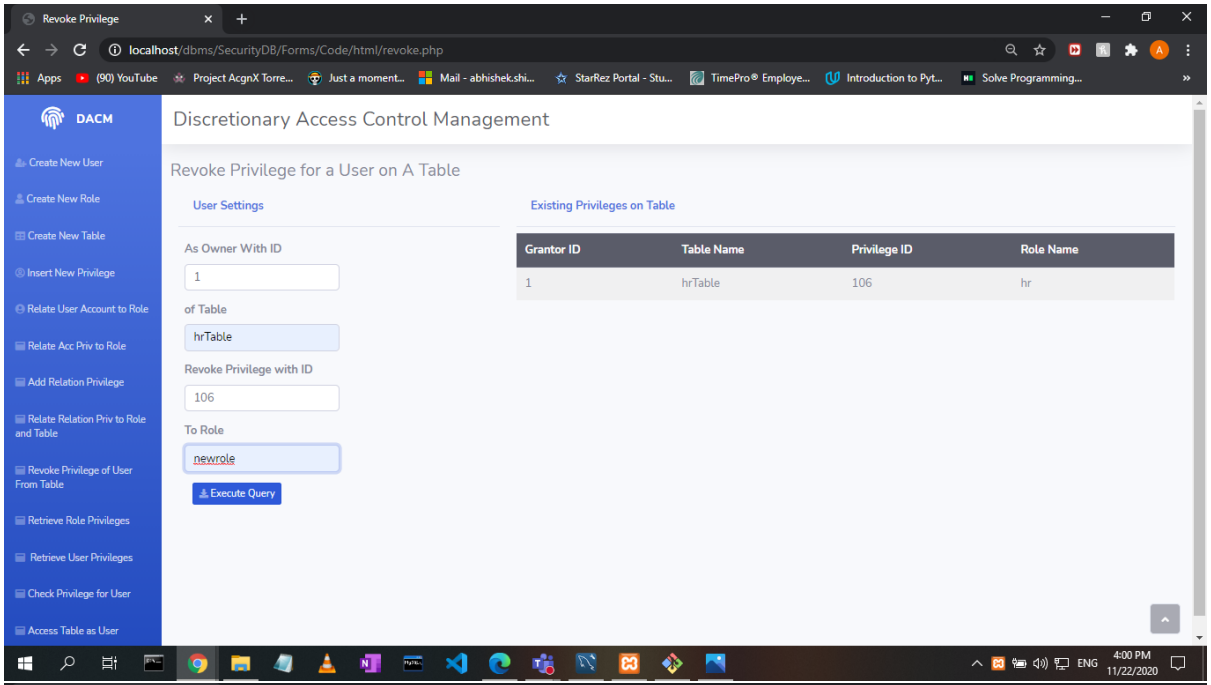

Relate Ternary
localhost/dbms/SecurityDB/Forms/Code/html/relate-ternary.php
DACM
Discretionary Access Control Management
Access Denied. Entered Owner ID is not the owner of the table
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Relate Account Privilege to Role and Table
User Settings
As Owner With ID
of Table
Grant Privilege with ID
To Role
Execute Query
Existing Privileges on Table
Grantor ID
Table Name
Privilege ID
Role Name
1
hrTable
106
hr
1
hrTable
106
newrole
ENG
3:59 PM
11/22/2020

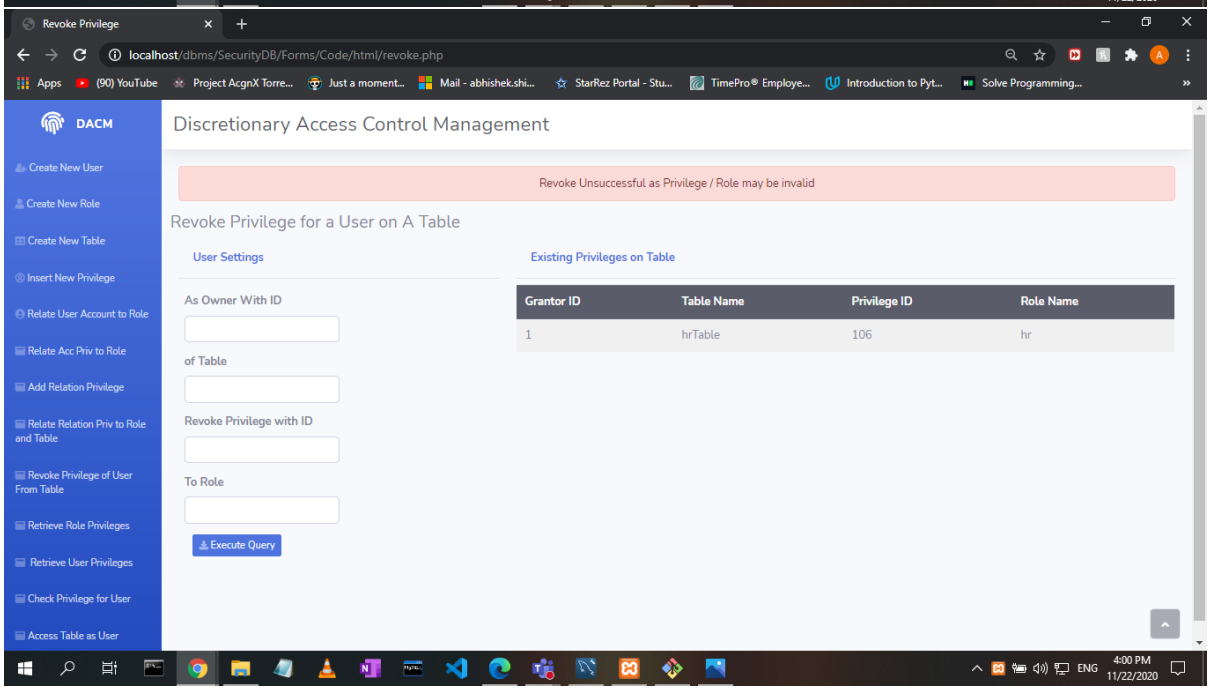

Relate Ternary
localhost/dbms/SecurityDB/Forms/Code/html/relate-ternary.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Relate Account Privilege to Role and Table
User Settings
As Owner With ID
1
of Table
hrTable
Grant Privilege with ID
103
To Role
newrole
Execute Query
Existing Privileges on Table
Grantor ID
Table Name
Privilege ID
Role Name
1
hrTable
106
hr
1
hrTable
106
newrole
ENG
3:59 PM
11/22/2020


Relate Ternary
localhost/dbms/SecurityDB/Forms/Code/html/relate-ternary.php
DACM
Discretionary Access Control Management
This Privilege Does Not Exist For Entered Table.
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Relate Account Privilege to Role and Table
User Settings
As Owner With ID
of Table
Grant Privilege with ID
To Role
Execute Query
Existing Privileges on Table
Grantor ID
Table Name
Privilege ID
Role Name
1
hrTable
106
hr
1
hrTable
106
newrole
ENG
3:59 PM
11/22/2020

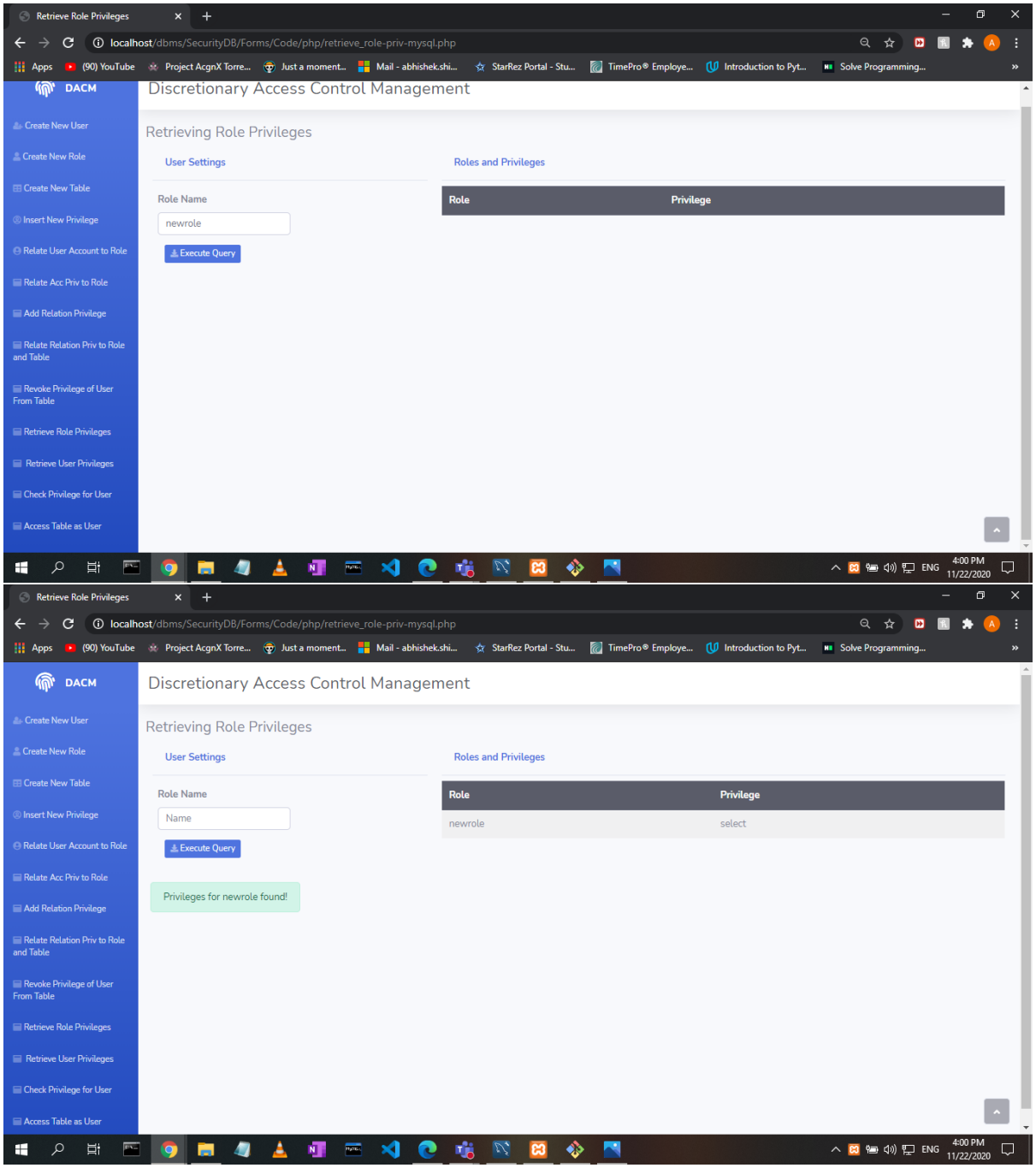
REVOKE PRIVILEGES FOR A USER ON TABLE

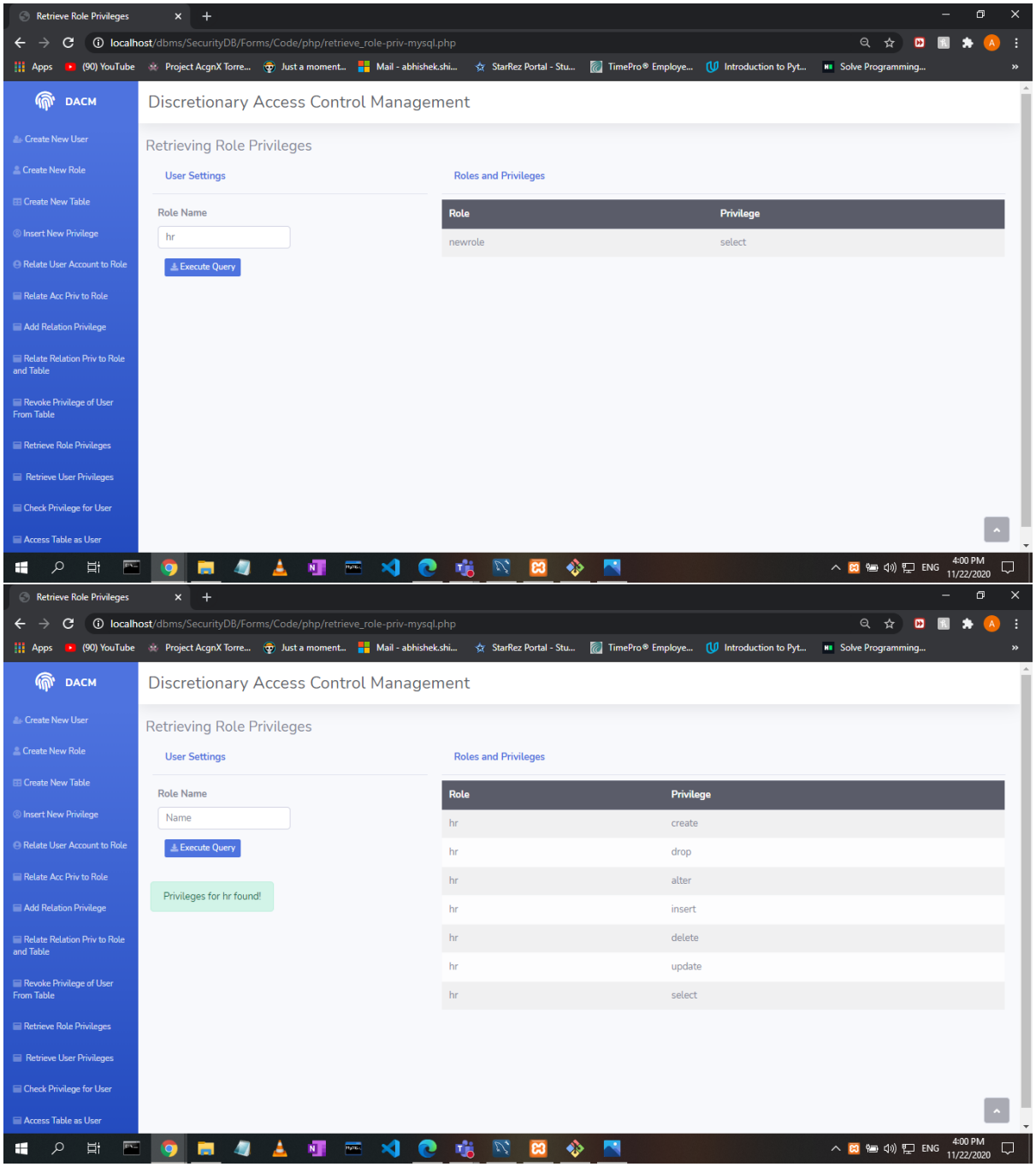



Revoke Privilege
localhost/dbms/SecurityDB/Forms/Code/html/revoke.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Revoke Privilege for a User on A Table
User Settings
As Owner With ID
1
of Table
hrTable
Revoke Privilege with ID
106
To Role
newrole
Execute Query
Existing Privileges on Table
Grantor ID
Table Name
Privilege ID
Role Name
1
hrTable
106
hr
ENG
4:00 PM
11/22/2020


Revoke Privilege
localhost/dbms/SecurityDB/Forms/Code/html/revoke.php
DACM
Discretionary Access Control Management
Revoke Unsuccessful as Privilege / Role may be invalid
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Revoke Privilege for a User on A Table
User Settings
As Owner With ID
of Table
Revoke Privilege with ID
To Role
Execute Query
Existing Privileges on Table
Grantor ID
Table Name
Privilege ID
Role Name
1
hrTable
106
hr
ENG
4:00 PM
11/22/2020

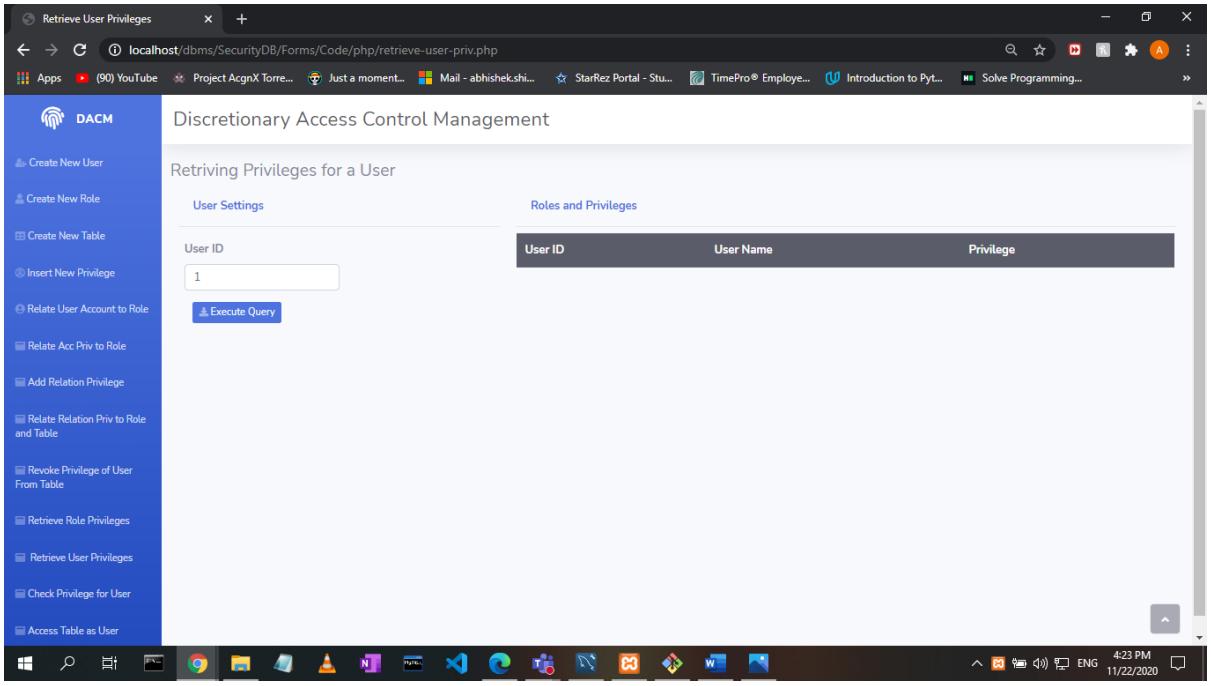
RETRIEVING ROLE PRIVILEGES

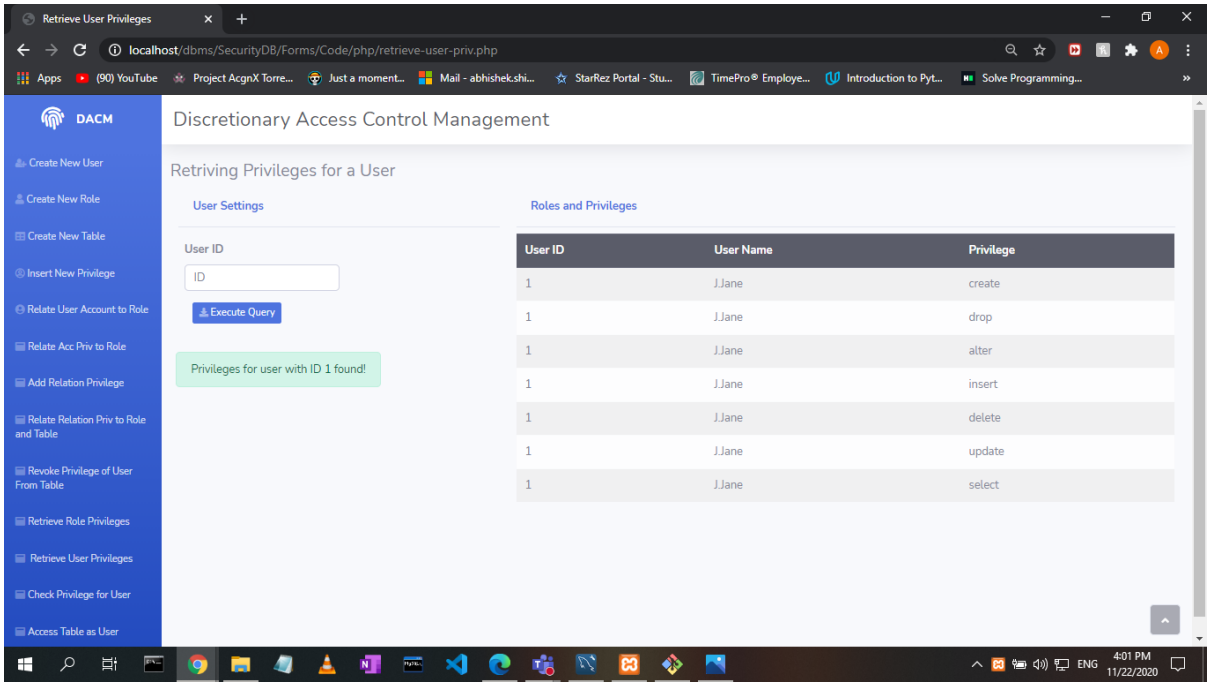


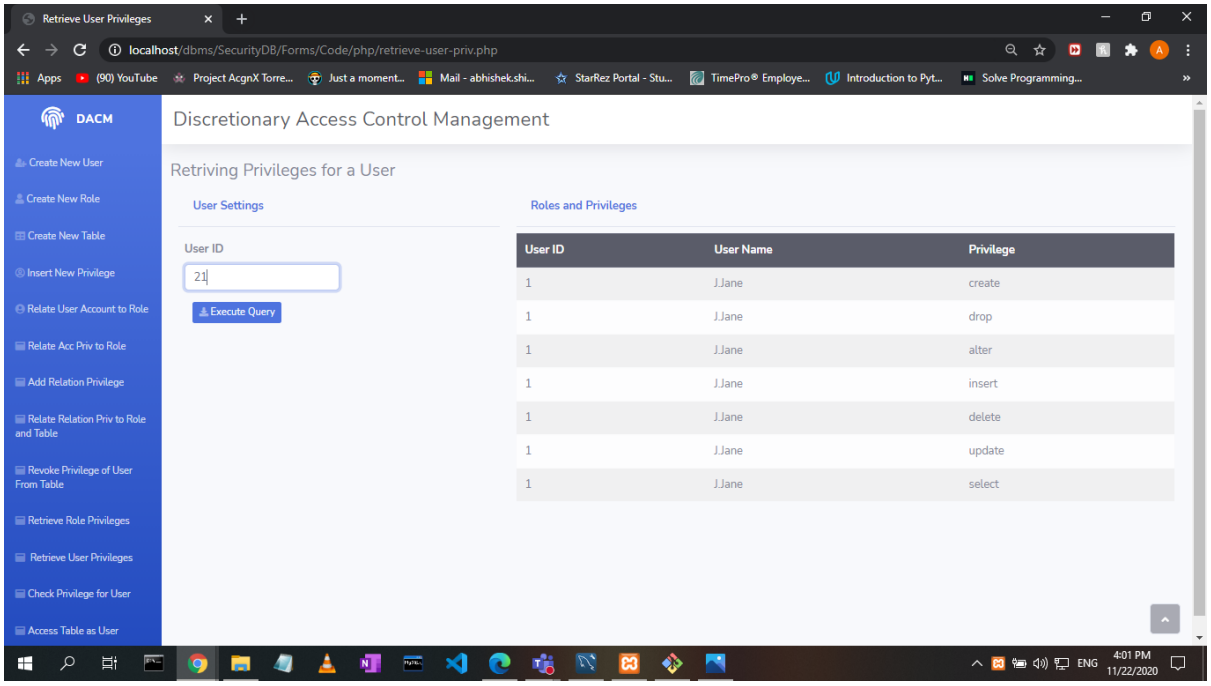

Retrieve Role Privileges
localhost/dbms/SecurityDB/Forms/Code/php/retrieve_role-priv-mysql.php
DACM
Discretionary Access Control Management
Retrieving Role Privileges
User Settings
Roles and Privileges
Role Name
hr
Execute Query
Role
Privilege
newrole
select
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
ENG
4:00 PM
11/22/2020

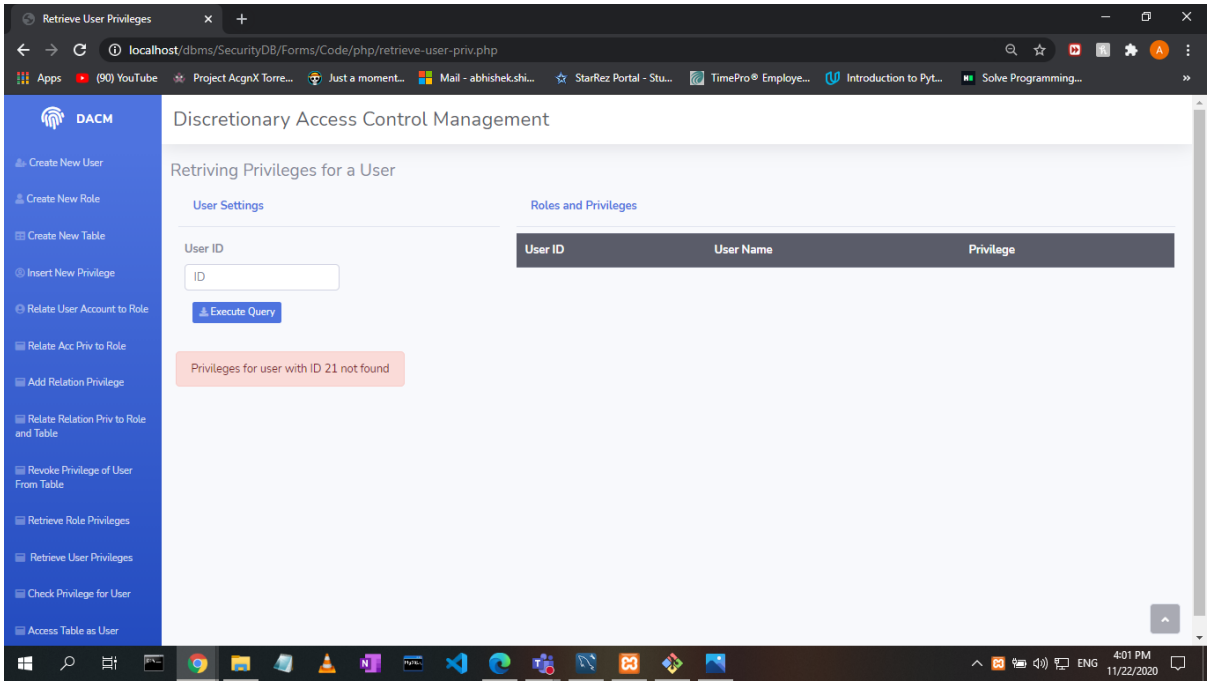
Retrieve Role Privileges
localhost/dbms/SecurityDB/Forms/Code/php/retrieve_role-priv-mysql.php
DACM
Discretionary Access Control Management
Retrieving Role Privileges
User Settings
Roles and Privileges
Role Name
Name
Execute Query
Privileges for hr found!
Role
Privilege
hr
create
hr
drop
hr
alter
hr
insert
hr
delete
hr
update
hr
select
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
ENG
4:00 PM
11/22/2020

RETRIEVING PRIVILEGES FOR A USER

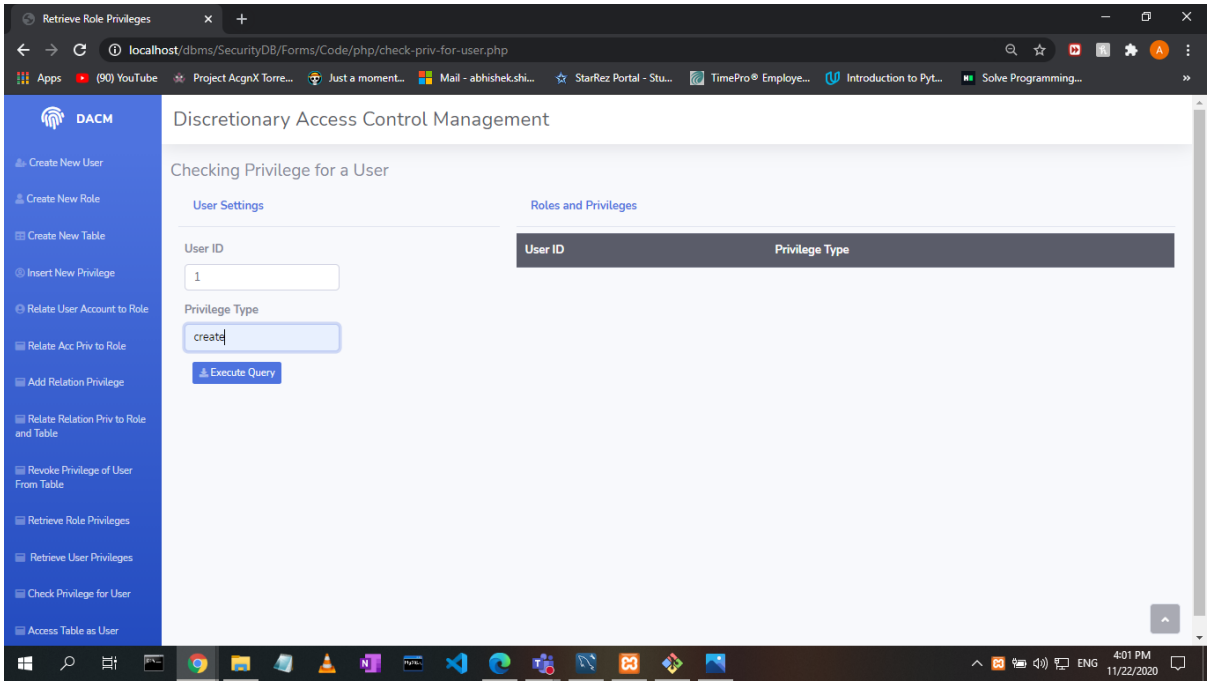


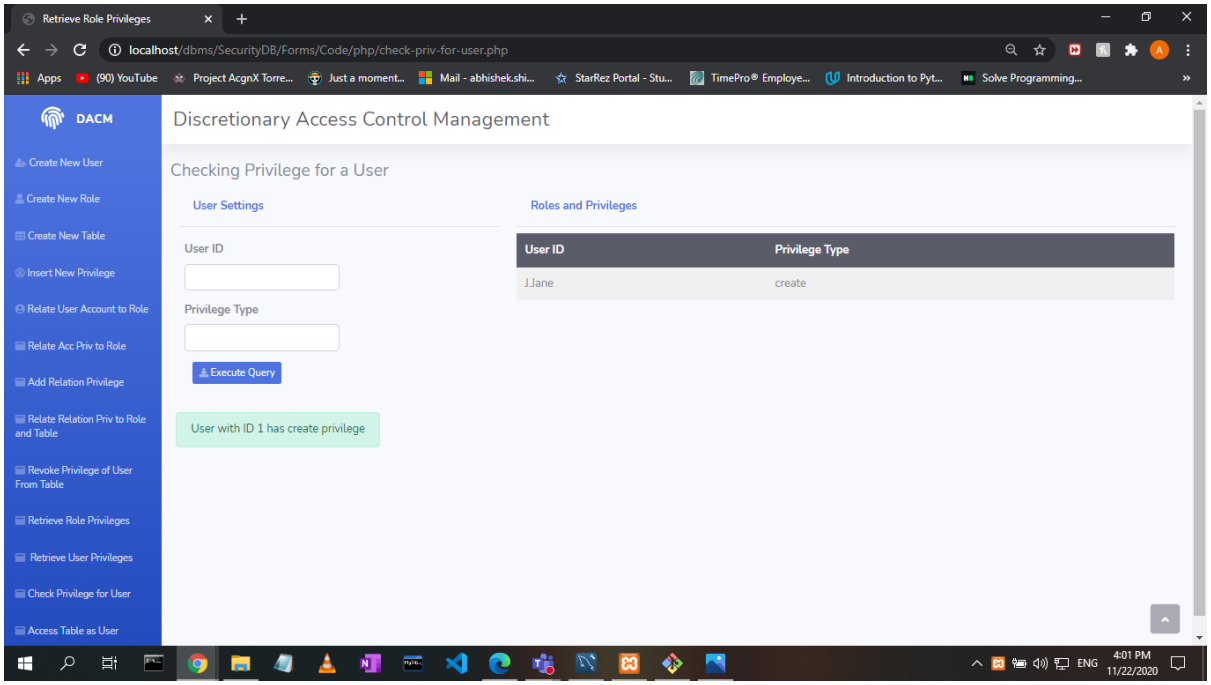


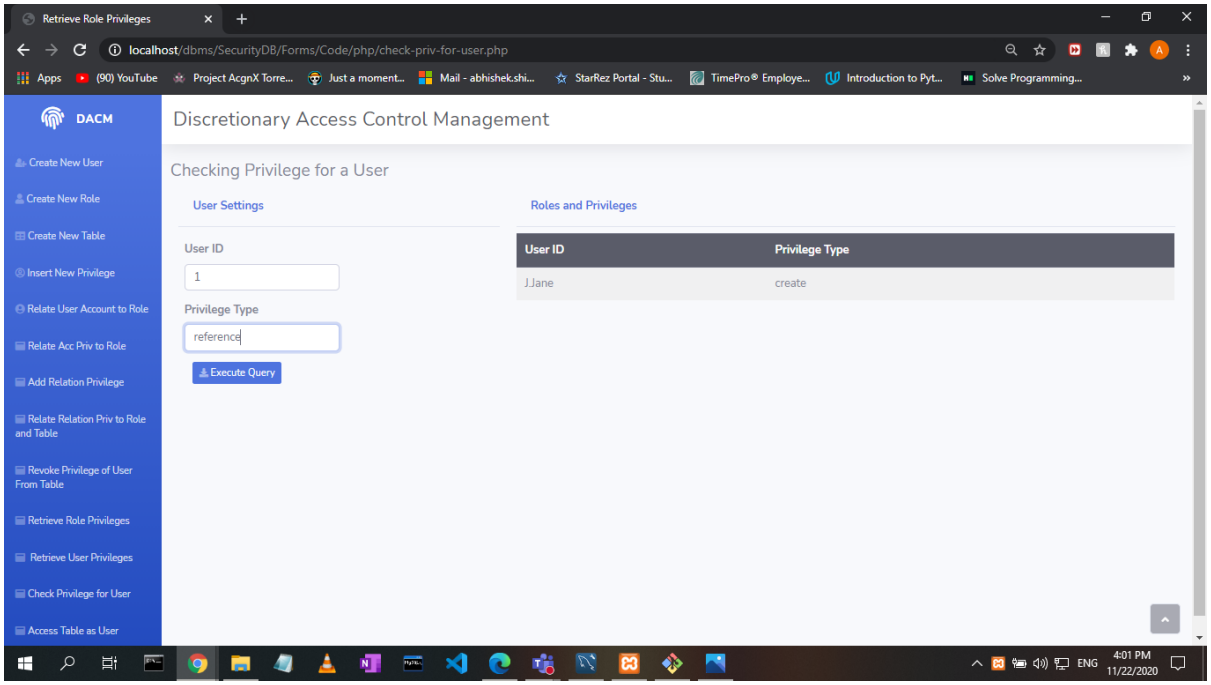

Retrieve User Privileges
localhost/dbms/SecurityDB/Forms/Code/php/retrieve-user-priv.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Retriving Privileges for a User
User Settings
Roles and Privileges
User ID
21
Execute Query
User ID
User Name
Privilege
1 J.Jane create
1 J.Jane drop
1 J.Jane alter
1 J.Jane insert
1 J.Jane delete
1 J.Jane update
1 J.Jane select
ENG
4:01 PM
11/22/2020

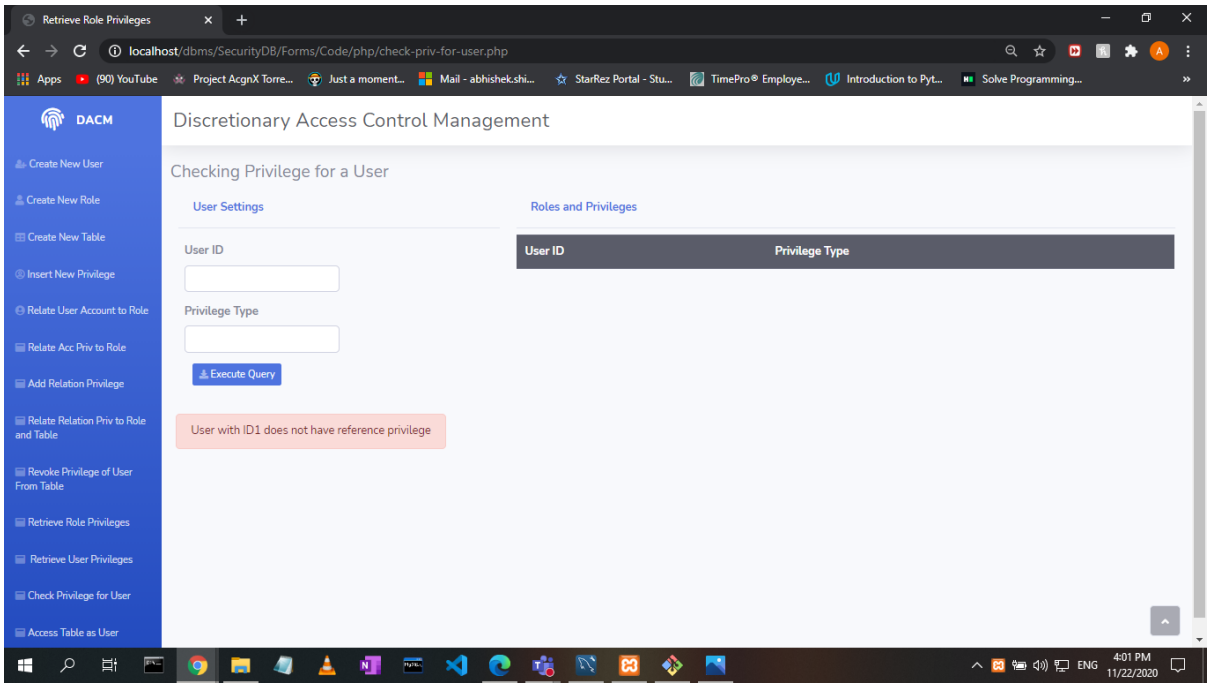

Retrieve User Privileges
localhost/dbms/SecurityDB/Forms/Code/php/retrieve-user-priv.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Retriving Privileges for a User
User Settings
Roles and Privileges
User ID
ID
Execute Query
User ID
User Name
Privilege
Privileges for user with ID 21 not found
ENG
4:01 PM
11/22/2020

CHECKING PRIVILEGES FOR A USER

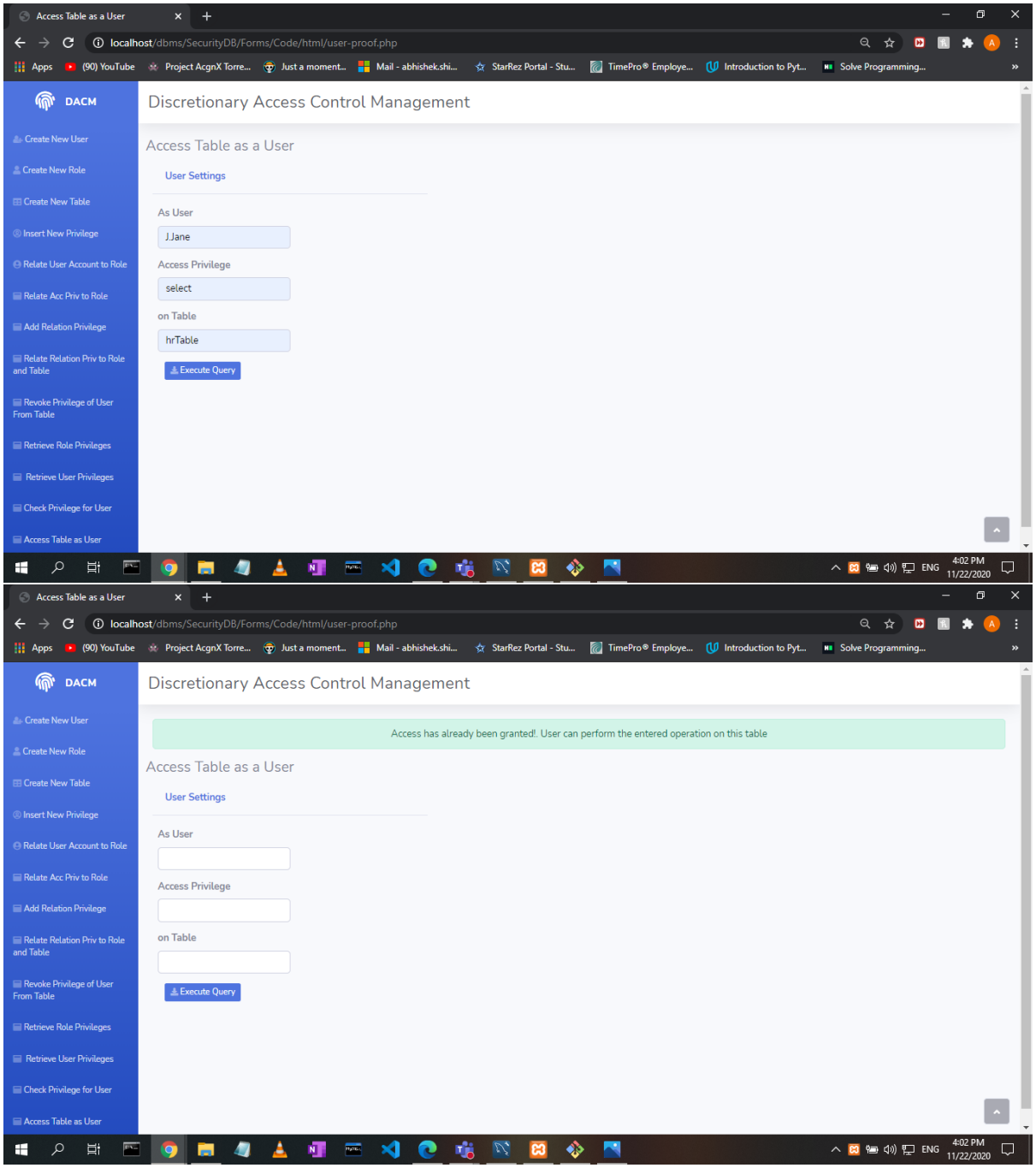


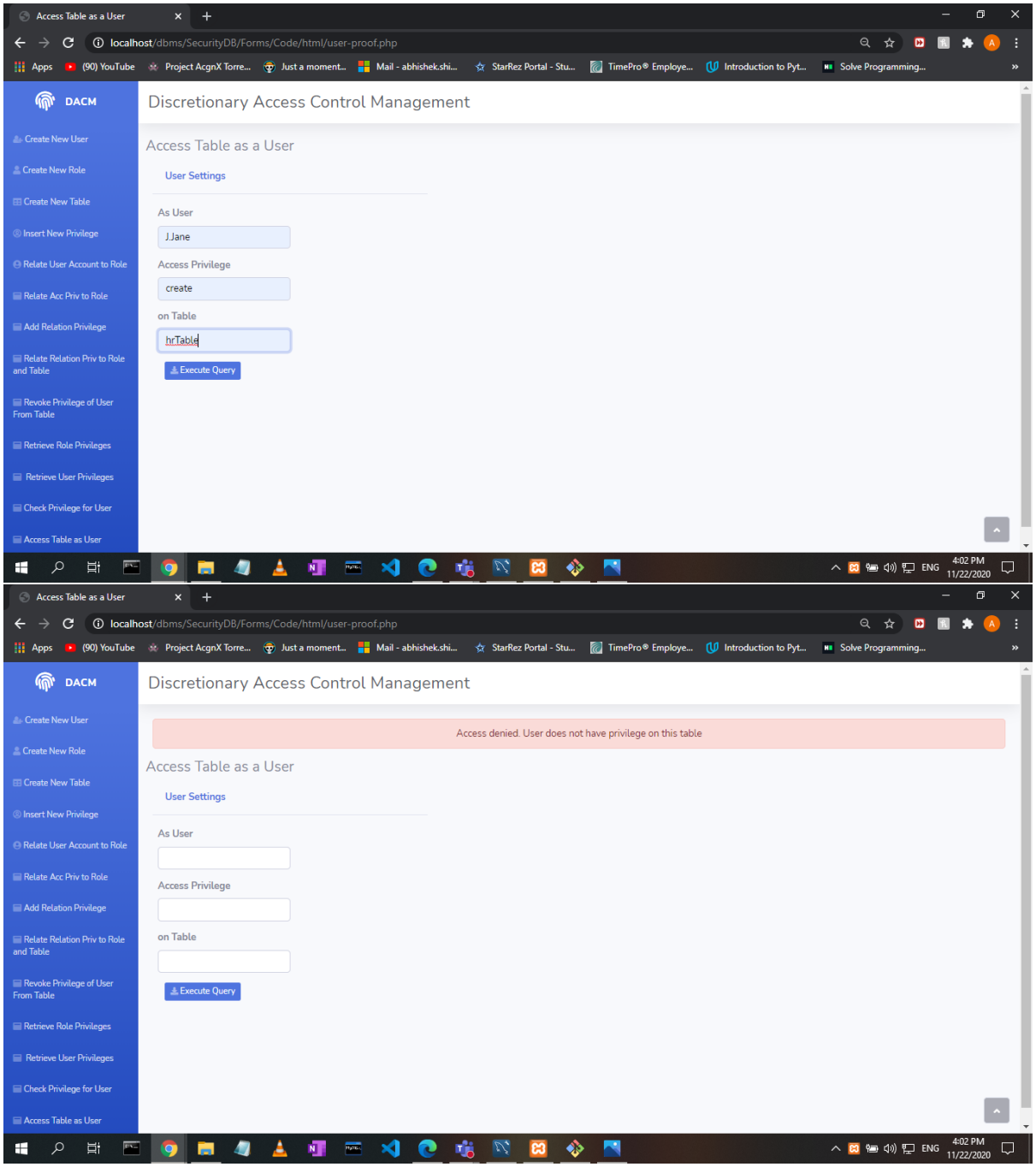


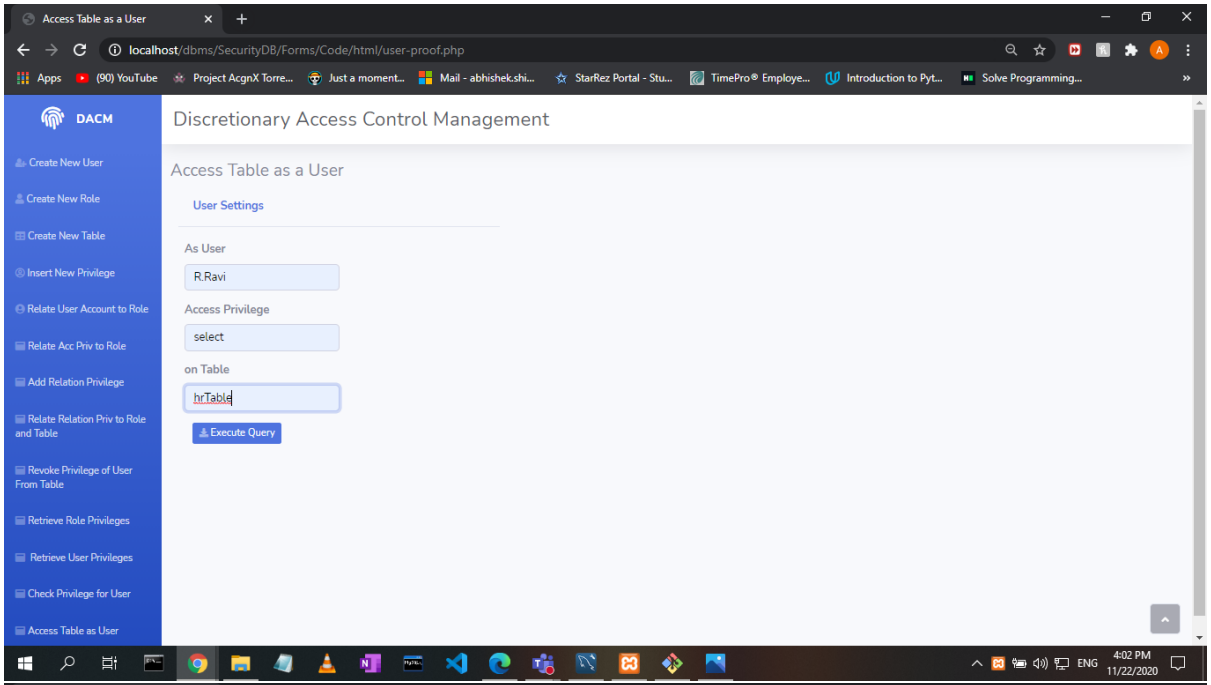

Retrieve Role Privileges
localhost/dbms/SecurityDB/Forms/Code/php/check-priv-for-user.php
DACM
Discretionary Access Control Management
Checking Privilege for a User
User Settings
Roles and Privileges
User ID
1
Privilege Type
reference
Execute Query
User ID
Privilege Type
J.Jane
create
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User


Retrieve Role Privileges
localhost/dbms/SecurityDB/Forms/Code/php/check-priv-for-user.php
DACM
Discretionary Access Control Management
Checking Privilege for a User
User Settings
Roles and Privileges
User ID
Privilege Type
Execute Query
User with ID1 does not have reference privilege
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User

ACCESS TABLE AS A USER




Access Table as a User
localhost/dbms/SecurityDB/Forms/Code/html/user-proof.php
DACM
Discretionary Access Control Management
Create New User
Create New Role
Create New Table
Insert New Privilege
Relate User Account to Role
Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Access Table as a User
User Settings
As User
J.Jane
Access Privilege
create
on Table
hrTable
Execute Query
Access denied. User does not have privilege on this table
ENG
4:02 PM
11/22/2020


Access Table as a User
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Create New Table
Insert New Privilege
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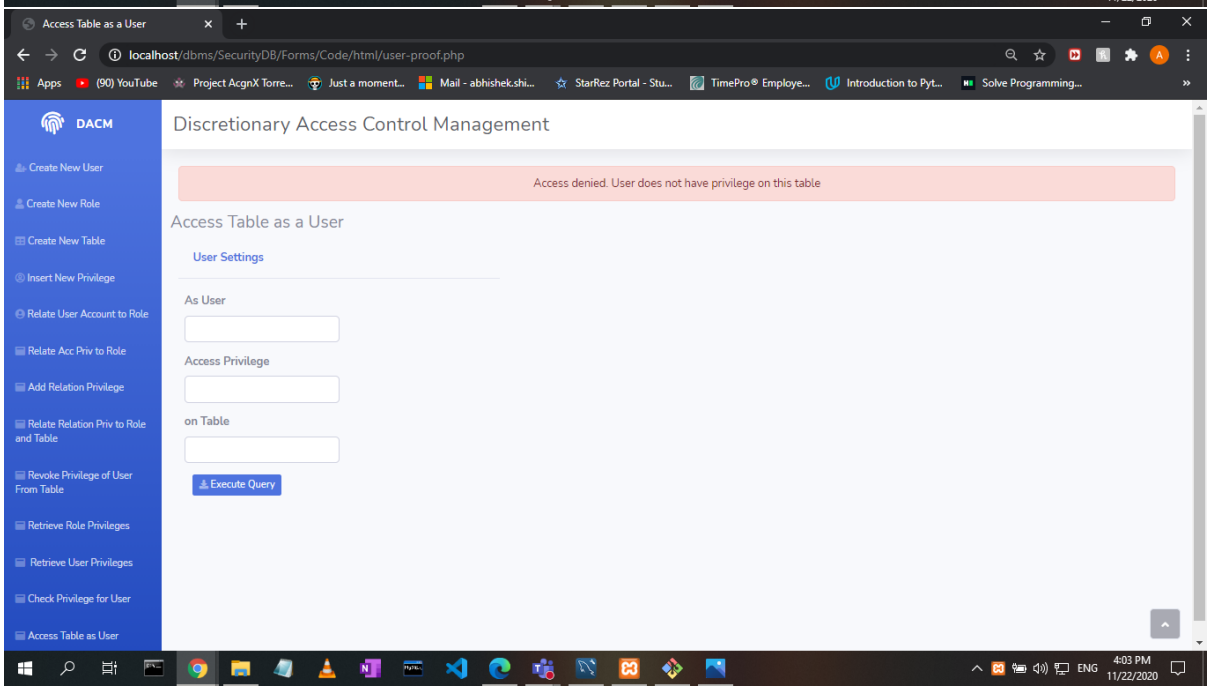
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Access Table as a User
User Settings
As User
R.Ravi
Access Privilege
select
on Table
hrTable
Execute Query
4:02 PM
11/22/2020


Access Table as a User
localhost/dbms/SecurityDB/Forms/Code/html/user-proof.php
DACM
Discretionary Access Control Management
Access denied. User does not have privilege on this table
Create New User
Create New Role
Create New Table
Insert New Privilege
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Relate Acc Priv to Role
Add Relation Privilege
Relate Relation Priv to Role and Table
Revoke Privilege of User From Table
Retrieve Role Privileges
Retrieve User Privileges
Check Privilege for User
Access Table as User
Access Table as a User
User Settings
As User
Access Privilege
on Table
Execute Query
4:03 PM
11/22/2020