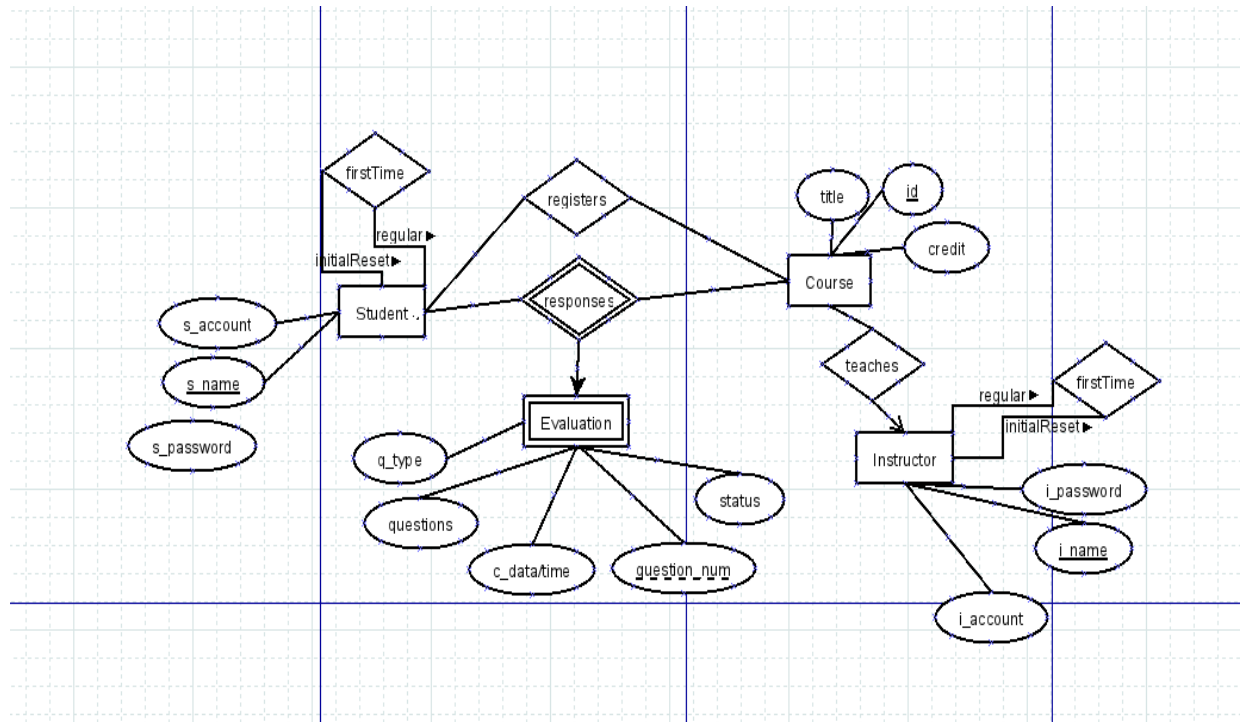


1.

1. Final Version of E-R diagram and tables creation SQL script

E-R Diagram



SQL:

```
CREATE TABLE Student(  
s_name char(25) Unique Key,  
s_password varchar(256),  
s_account varchar(20)  
);
```

```
CREATE TABLE Course(  
id char(15) UNIQUE KEY,  
title varchar(20),  
credit float(4)  
);
```

```
CREATE TABLE Instructor(  
i_name char(25) Unique Key,  
i_password varchar(256),  
i_account varchar(20)  
);
```

```
CREATE TABLE Evaluation(  

```

```
id char(15),
question_num char(5),
question varchar(255),
q_type tinyInt,
Unique KEY (id, question_num ),
foreign key(id) references Course(id)
);
```

```
CREATE TABLE registers(
id char(15),
s_name char(25) NOT NULL,
status bool,
primary key (id, s_name),
CONSTRAINT fk_registers_sAccount FOREIGN KEY (s_name) REFERENCES
Student(s_name),
CONSTRAINT fk_registers_id FOREIGN KEY (id) REFERENCES Course(id)
);
```

```
CREATE TABLE responses(
id char(15),
status bool,
s_name char(25) NOT NULL,
question_num char(5),
response varchar(256),
cDateTime TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE
CURRENT_TIMESTAMP,
Constraint fk_course_id FOREIGN KEY (id) references Course(id),
Constraint fk_student_name FOREIGN KEY (s_name) references Student(s_name)
);
```

```
CREATE TABLE teaches(
id char(15),
i_name char(25),
primary key (id, i_name),
FOREIGN KEY (id) references Course(id),
FOREIGN KEY (i_name) references Instructor(i_name)
);
```

```
grant select, insert, update, delete on Instructor to 'cs3425gr'@'%';
grant select, insert, update, delete on Instructor to 'cs3425gr'@'localhost';
grant select, insert, update, delete on Student to 'cs3425gr'@'%';
grant select, insert, update, delete on Student to 'cs3425gr'@'localhost';
grant select, insert, update, delete on Evaluation to 'cs3425gr'@'%';
grant select, insert, update, delete on Evaluation to 'cs3425gr'@'localhost';
```

```
grant select, insert, update, delete on registers to 'cs3425gr'@'%';
grant select, insert, update, delete on registers to 'cs3425gr'@'localhost';
grant select, insert, update, delete on responses to 'cs3425gr'@'%';
grant select, insert, update, delete on responses to 'cs3425gr'@'localhost';
```

2. Describe how your code prevents SQL Injection.

For pretty much everything in my code I have used prepare statements and bindParam() function to make my code secure from any possible injection. I also have tested it by using basic SQL injection statements such as 105 OR 1=1 and " or ""=".

Code:

Example of one related function:

```
function i authenticate($user, $passwd) {
    try {
        $dbh = connectDB();
        $statement = $dbh->prepare("SELECT count(*) FROM Instructor ".
            "where i_name =:username and i_password = sha2(:passwd,256) ");
        $statement->bindParam(":username", $user);
        $statement->bindParam(":passwd", $passwd);
        $result = $statement->execute();
        $row=$statement->fetch();
        $dbh=null;
        return $row[0];
    }catch (PDOException $e) {
        print "Error!" . $e->getMessage() . "<br/>";
        die();
    }
}
```

Also used transactions in some of the functions as well, so if it catches a weird injection we can just roll back.

```
function register_course($user, $register){
    try{
        $dbh = connectDB();
        $dbh->beginTransaction();

        $statement = $dbh->prepare("SELECT count(*)
            FROM registers WHERE s_name =:username AND id=:course");
        $statement->bindParam(":username",$user);
        $statement->bindParam(":course",$register);
        $result = $statement->execute();
        $row = $statement->fetch();
```

```

if($row[0] == 1){
    echo "Course $register already exist.";
    $dbh->rollBack();
    $dbh=null;
    return;
}

```

3. Perform Tasks

a. Create account:

Before

	s_name	s_password
►	Mary	a665a45920422f9d417e4867efdc4fb8a04a1f3fff...
	Jordan	f6e0a1e2ac41945a9aa7ff8a8aaa0cebc12a3bcc...
	Jame	6b86b273ff34fce19d6b804eff5a3f5747ada4eaa...
	Pech	a665a45920422f9d417e4867efdc4fb8a04a1f3fff...

```
call createStudent("Alice", NULL, NULL);
```

	s_name	s_password
►	Mary	a665a45920422f9d417e4867efdc4fb8a04a1f3fff...
	Jordan	f6e0a1e2ac41945a9aa7ff8a8aaa0cebc12a3bcc...
	Jame	6b86b273ff34fce19d6b804eff5a3f5747ada4eaa...
	Pech	a665a45920422f9d417e4867efdc4fb8a04a1f3fff...
	Alice	NULL

	Alice	f6e0a1e2ac41945a9aa7ff8a8aaa0cebc12a3bcc...	NULL
--	-------	---	------

Array ([username] => Alice [setCourse] => CS3425) ,
Set Initial Password

Enter your username and the initial password

Username:

Password:

Welcome Alice

Student main page

Here are all of the pages that you'll be able to access

What would you like to do? Click one of the buttons

b. Create course

```
call createCourse("CS1011", NULL ,NULL);
```

```
call assignInstructor("CS1011", "Jon");
```

	id	title	credit		id	i_name
▶	CS1000	NULL	NULL		CS1000	Jon
	CS3425	NULL	NULL		CS1011	Jon
	CS1011	NULL	NULL		CS3425	Jon

c. Register

Register Course

Select all of the course you would like to register for.

Array ([0] => Array ([course] => CS1000 [0] => CS1000) [1] => Array ([course] => CS1011 [0] => CS1011) [2] => Array ([course] => CS3425 [0] => CS3425))

Courses

CS1000
CS1011
CS3425

Register Drop

Current Registered Courses

Array ()

Course

Back

Register Course

Select all of the course you would like to register for.

Array ([0] => Array ([course] => CS1000 [0] => CS1000) [1] => Array ([course] => CS1011 [0]

Courses

CS1000
CS1011
CS3425

Register Drop

Current Registered Courses

Array ([0] => Array ([Courses] => CS1011 [0] => CS1011 [Evaluation] => 0 [1] => 0))

Course

CS1011

Back No course was selected!

d. Take survey and completion check

Array ([username] => Alice [setCourse] => CS1011) Array ([courses] => CS1011 [set] => Set)

[Back](#)

Courses

CS1011

[Set](#)

Course is set

0

Fall 2021 Main Evaluation Group

Course Name:

CS1011

Given the opportunity, I would take another course from this instructor.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

The instructor engaged students by encouraging course preparation, reflection, or other activities outside of class.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

The organization of the class helped me to learn.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

The instructor encouraged students to seek additional help outside of class.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Survey status for all of your registered course.

Array ([0] => Array ([Course] => CS1011 [0] => CS1011 [if(responses.status=1,"Complete","Incomplete")] => Complete [1] => Complete [DateAndTime 14 21:38:12 [2] => 2021-12-14 21:38:12]))

Course	Evaluation Status	Completion Date/Time
CS1011	Complete	2021-12-14 21:38:12

[Back](#) [Take survey](#)

e. List of student for specified course

Welcome Jon

Main page

Here are all of the pages that you'll be able to access

What would you like to do? Click one of the buttons

Array ([username] => Jon [setCourse] => CS1011) Array ([courses] => CS1011 [set] => Set)

Student List

Here you can view all of students in each of your respected course.

First select a course

Courses

CS1000

CS1011

CS3425

Course is set

Courses	List of student
CS1011	Alice

f. Reviews survey questions for specified course

Courses

CS1000

CS1011

CS3425

Course is set

Evaluation statistic

Question 1.)

Given the opportunity, I would take another course from this instructor.

Response Option	Frequency	Percentage
Strongly Disagree	0	0
Disagree	0	0
Neutral	0	0
Agree	1	1
Strongly Agree	0	0

r is Strongly Agree

Response Rate: 1.0000

Question 2.)

The instructor engaged students by encouraging course preparation, reflection, or other activities outside of class.

Different examples.

Evaluation statistic

Question 1.)

Given the opportunity, I would take another course from this instructor.

Response Option	Frequency	Percentage
Strongly Disagree	1	0.5
Disagree	0	0
Neutral	0	0
Agree	1	0.5
Strongly Agree	0	0

r is Strongly Agree

Response Rate: 1.0000

Question 2.)