

1. Your database tables and attributes (2 tables minimum, 5 tables maximum, 3 attributes minimum per table, 15 attributes maximum per table). You need to explain each table, attribute, and PK-FK relationships.

My Database for the Dorm system consists of the following tables:

Student

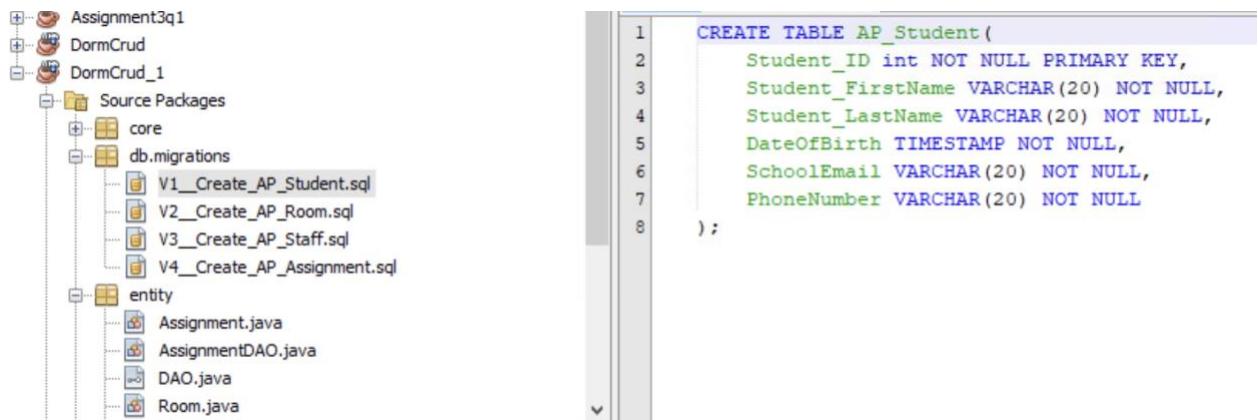
Room

Staff

Assignment

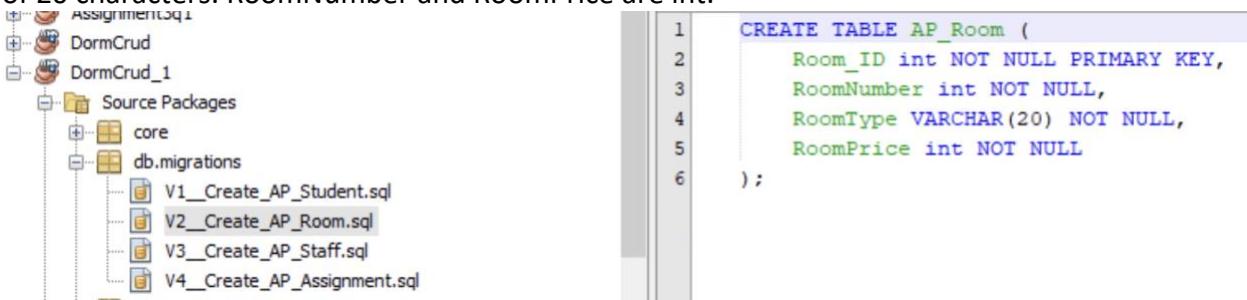
Each Table has its own attributes Like Primary Keys and the table Assignment has 3 Foreign Keys

- 1- This is my student table. It contains Student_ID as a primary key that is int. Student_Firstname, Student_LastName, SchoolEmail, and phone number are Strings of 20 characters. DateOfBirth is a TIMESTAMP,



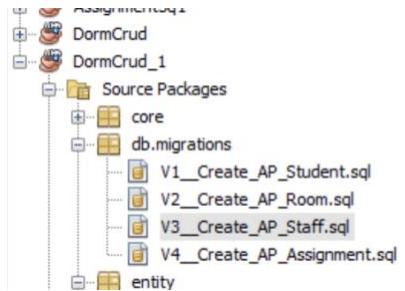
```
CREATE TABLE AP_Student(
    Student_ID int NOT NULL PRIMARY KEY,
    Student_FirstName VARCHAR(20) NOT NULL,
    Student_LastName VARCHAR(20) NOT NULL,
    DateOfBirth TIMESTAMP NOT NULL,
    SchoolEmail VARCHAR(20) NOT NULL,
    PhoneNumber VARCHAR(20) NOT NULL
);
```

- 2- This is my Room Table. Has Room_ID as Primary Key that is int. RoomType as a String of 20 characters. RoomNumber and RoomPrice are int.



```
CREATE TABLE AP_Room (
    Room_ID int NOT NULL PRIMARY KEY,
    RoomNumber int NOT NULL,
    RoomType VARCHAR(20) NOT NULL,
    RoomPrice int NOT NULL
);
```

- 3- This is My Staff Table. Staff_ID is the primary key as an int. HireDate is a TIMESTAMP. The rest of the attributes in the picture below are all Strings of 20 characters maximum.



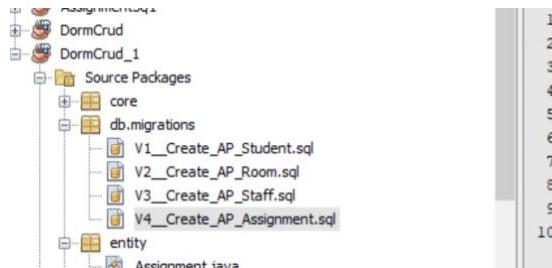
```

CREATE TABLE AP_Staff(
    Staff_ID int NOT NULL PRIMARY KEY,
    Staff_FirstName VARCHAR(20) NOT NULL,
    Staff_LastName VARCHAR(20) NOT NULL,
    HireDate TIMESTAMP NOT NULL,
    StaffPosition VARCHAR(100) NOT NULL,
    StaffDepartment VARCHAR(100) NOT NULL,
    StaffPhoneNumber VARCHAR(20) NOT NULL,
    SchoolEmail VARCHAR(20) NOT NULL
);

```

- 4- This is my Assignment table. Assignment_ID is the primary key as an int. DateAssigned is a TIMESTAMP. This table contains 3 foreign keys:
1. Student_ID which references the Student_ID in the AP_Student table.
 2. Room_ID which references the Room_ID in the AP_Room table.
 3. Staff_ID which references the Staff_ID in the AP_Staff table.

The foreign keys are used to reference a student and his info to hire and insert as also a staff.



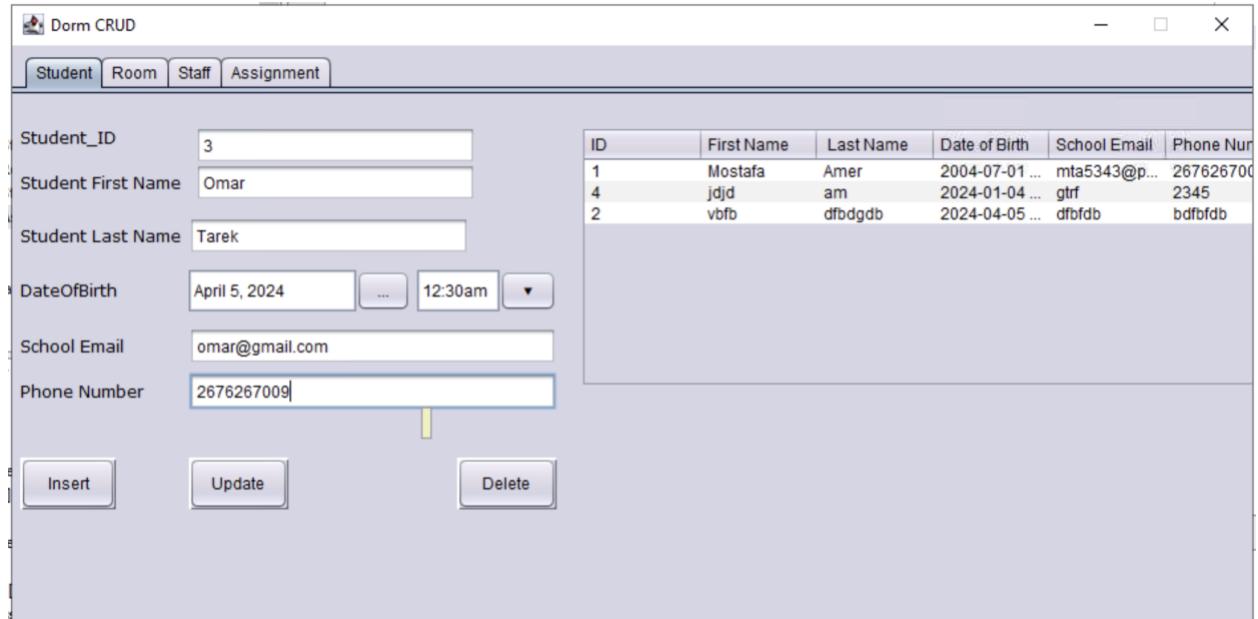
```

CREATE TABLE AP_Assignment(
    Assignment_ID int NOT NULL PRIMARY KEY,
    DateAssigned TIMESTAMP NOT NULL,
    Student_ID int NOT NULL,
    Room_ID int NOT NULL,
    Staff_ID int NOT NULL,
    FOREIGN KEY (Student_ID) REFERENCES AP_Student(Student_ID),
    FOREIGN KEY (Room_ID) REFERENCES AP_Room(Room_ID),
    FOREIGN KEY (Staff_ID) REFERENCES AP_Staff(Staff_ID)
);

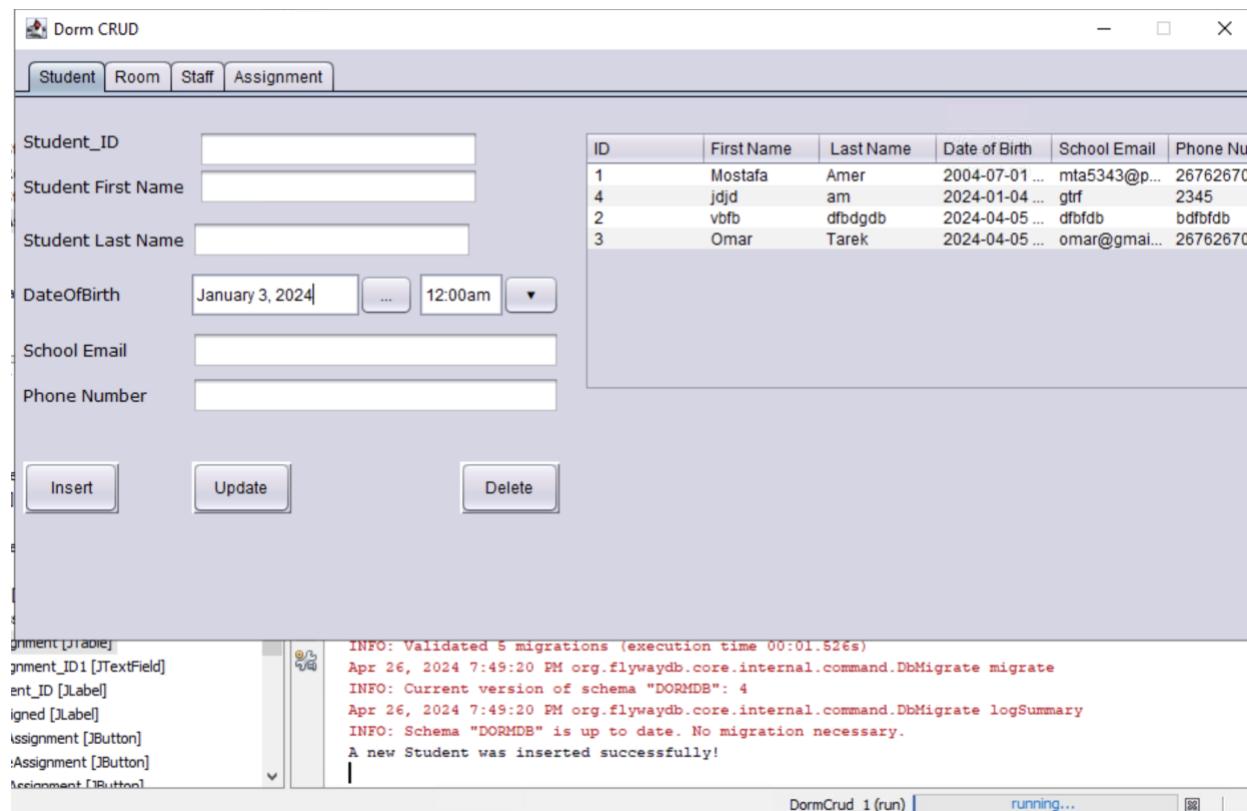
```

2. How to create a record for every table? Show your table before creating a record. Show your interface for creating a record (GUI, Command Line, etc.). Show your table after creating a record.

- 1- Table assignment before Insert:



- Table assignment After Insert:



2- Table Room before Insert:

Room ID	Room Number	Room Type	Room Price
1	34	mfm	23

- Table Room After Insert:

Room ID	Room Number	Room Type	Room Price
1	34	mfm	23
2	97	Double	1350

Below the table, a terminal window displays Flyway migration logs:

```
gnment [JTable]  
gnment_ID1 [JTextField]  
ent_ID [JLabel]  
igned [JLabel]  
ssignment [JButton]  
Assignment [JButton]  
ssignment [JButton]  
gnment [JTable]  
gnment_ID1 [JTextField]  
ent_ID [JLabel]  
igned [JLabel]  
ssignment [JButton]  
Assignment [JButton]  
ssignment [JButton]  
Apr 26, 2024 7:49:20 PM org.flywaydb.core.internal.command.DbMigrate migrate  
INFO: Current version of schema "DORMDB": 4  
Apr 26, 2024 7:49:20 PM org.flywaydb.core.internal.command.DbMigrate logSummary  
INFO: Schema "DORMDB" is up to date. No migration necessary.  
A new Student was inserted successfully!  
A new Room was inserted successfully!
```

3- Table Staff Before Insert:

Dorm CRUD

Student Room Staff Assignment

Staff_ID	2	ID	First Na...	Last Na...	Hire Date	Position	Depart...	Phone ...	School ...
First Name	Mostafa	1	Mostafa	Amer	2024-04...	djdfjsd	dfsss	23456	bdfg
Last Name	Amer								
Hire Date	April 4, 2024	...	1:00am						
Position	Machine Learning Researcher								
Department	AI								
Phone Number	2676267009								
School Email	mta5343@psu.edu								

Insert **Update** **Delete**

- Table Staff After Insert:

Dorm CRUD

Student Room Staff Assignment

Staff_ID		ID	First Na...	Last Na...	Hire Date	Position	Depart...	Phone ...	School ...
First Name		1	Mostafa	Amer	2024-04...	djdfjsd	dfsss	23456	bdfg
Last Name		2	Mostafa	Amer	2024-04...	Machine...	AI	267626...	mta534...
Hire Date	January 4, 2024	...	12:00am						
Position									
Department									
Phone Number									
School Email									

Insert **Update** **Delete**

Assignment [JTable]
Assignment_ID1 [JTextField]
ent_ID [JLabel]
gned [JLabel]
ssignment [JButton]
Assignment [JButton]
ssignment [JButton]

INFO: Current version of schema "DORMDB": 4
Apr 26, 2024 7:49:20 PM org.flywaydb.core.internal.command.DbMigrate logSummary
INFO: Schema "DORMDB" is up to date. No migration necessary.
A new Student was inserted successfully!
A new Room was inserted successfully!
A new Staff was inserted successfully!

DormCrud_1 (run) running...

4- Table Assignment Before Insert:

Dorm CRUD

Student Room Staff Assignment

Assignment_ID	Date Assigned	Student_ID	Room_ID	Staff_ID
1	2024-04-05 01:00:00	4	1	1

Assignment_ID: 2
Date Assigned: April 12, 2024
Student_ID: 1
Room_ID: 1
Staff_ID: 1

Insert Update Delete

- Table Assignment After Insert:

Dorm CRUD

Student Room Staff Assignment

Assignment_ID	Date Assigned	Student_ID	Room_ID	Staff_ID
1	2024-04-05 01:00:00	4	1	1
2	2024-04-12 01:00:00	1	1	1

Assignment_ID: [Text Field]
Date Assigned: January 17, 2024
Student_ID: [Text Field]
Room_ID: [Text Field]
Staff_ID: [Text Field]

Insert Update Delete

Assignment [Table]
Assignment_ID1 [TextField]
int_ID [Label]
gned [Label]
ssignment [Button]
Assignment [Button]
Assignment [Button]

Apr 26, 2024 7:49:20 PM org.flywaydb.core.internal.command.DbMigrate logSummary
INFO: Schema "DORMDB" is up to date. No migration necessary.
A new Student was inserted successfully!
A new Room was inserted successfully!
A new Staff was inserted successfully!
A new Assignment was inserted successfully!

DormCrud_1 (run) | running... |

3. How to update a record for every table? Show your table before updating a record. Show your interface for updating a record (GUI, Command Line, etc.). Show your table after updating a record.

1- Table Student before Update:

ID	First Name	Last Name	Date of Birth	School Email	Phone Num
1	Mostafa	Amer	2004-07-01 ...	mta5343@p... 267626700	
4	jdjd	am	2024-01-04 ...	gtrf 2345	
2	vfbf	dfbdgdb	2024-04-05 ...	dfbfdb bdfbfd	
3	Omar	Tarek	2024-04-05 ...	omar@gmai... 267626700	

- Table Student after update:

ID	First Name	Last Name	Date of Birth	School Email	Phone Num
1	Mostafa	Amer	2004-07-01 ...	mta5343@p... 267626700	
4	Ziyad	Amer	2024-01-04 ...	zksm@psu.... 2345	
2	vfbf	dfbdgdb	2024-04-05 ...	dfbfdb bdfbfd	
3	Omar	Tarek	2024-04-05 ...	omar@gmai... 267626700	

INFO: Schema "DORMDB" is up to date. No migration necessary.
 A new Student was inserted successfully!
 A new Room was inserted successfully!
 A new Staff was inserted successfully!
 A new Assignment was inserted successfully!
 An existing Student was updated successfully!

2- Table Room Before updating:

The screenshot shows a Windows application window titled "Dorm CRUD". At the top, there is a navigation bar with tabs: Student, Room, Staff, and Assignment. The "Room" tab is selected. On the left, there is a form with four input fields: "Room_ID" (value 1), "Room Number" (value 21), "Room Type" (value dum), and "Room Price" (value 19). Below the form are three buttons: "Insert", "Update", and "Delete". On the right side of the window, there is a table with columns: Room ID, Room Number, Room Type, and Room Price. The table contains two rows: Row 1 (Room ID 1, Room Number 34, Room Type mfm, Room Price 23) and Row 2 (Room ID 2, Room Number 97, Room Type Double, Room Price 1350).

- Table Room After updating:

This screenshot shows the same "Dorm CRUD" application window after an update has been performed. The Room form's input fields now have empty values. The table on the right shows the updated data: Row 1 (Room ID 1, Room Number 21, Room Type dum, Room Price 19) and Row 2 (Room ID 2, Room Number 97, Room Type Double, Room Price 1350). At the bottom of the window, there is a log window displaying Flyway migration logs. The log output includes:

```
INFO: Validated 5 migrations (execution time 00:01.777s)
Apr 26, 2024 8:17:26 PM org.flywaydb.core.internal.command.DbMigrate migrate
INFO: Current version of schema "DORMDB": 4
Apr 26, 2024 8:17:26 PM org.flywaydb.core.internal.command.DbMigrate logSummary
INFO: Schema "DORMDB" is up to date. No migration necessary.
An existing Room was updated successfully!
```

The status bar at the bottom indicates "DormCrud_1 (run) running...".

3- Table Staff before updating:

Dorm CRUD

Student Room Staff Assignment

Staff_ID	1
First Name	Mostafa
Last Name	Amer
Hire Date	April 3, 2024
Position	djdfjsd
Department	dfsss
Phone Number	23456
School Email	bdfg

- Table Staff after updating:

Dorm CRUD

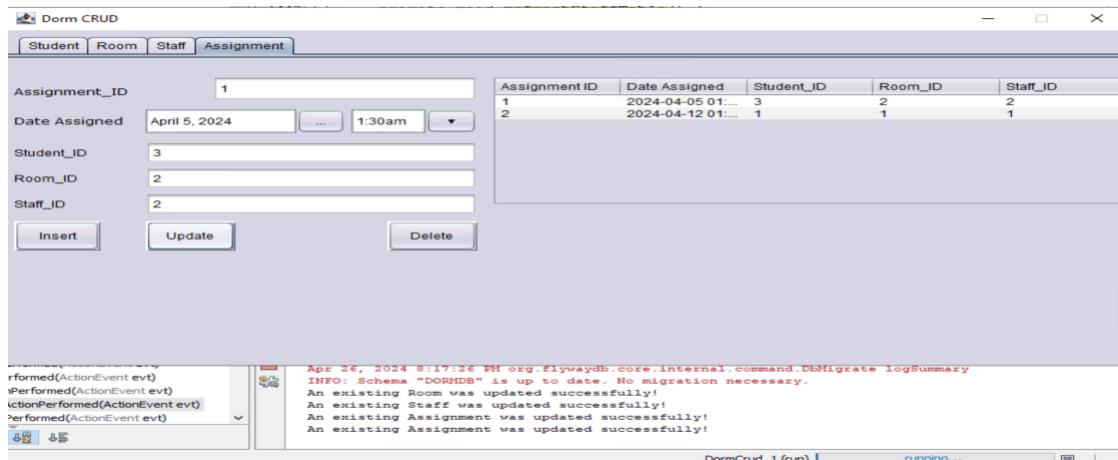
Student Room Staff Assignment

Staff_ID	1
First Name	BOBO
Last Name	MOMO
Hire Date	April 3, 2024
Position	YOYO
Department	ZOZO
Phone Number	2020
School Email	7878

Apr 26, 2024 8:17:26 PM org.flywaydb.core.internal.command.DbMigrate migrate
INFO: Current version of schema "DORMDB": 4
Apr 26, 2024 8:17:26 PM org.flywaydb.core.internal.command.DbMigrate logSummary
INFO: Schema "DORMDB" is up to date. No migration necessary.
An existing Room was updated successfully!
An existing Staff was updated successfully!

DormCrud_1 (run) running...

4- Table Assignment Before updating;



4. How to delete a record for every table? Show your table before deleting a record. Show your interface for deleting a record (GUI, Command Line, etc.). Show your table after deleting a record.

1- Table Student before delete:

Dorm CRUD

	Student	Room	Staff	Assignment
Student_ID	4			
Student First Name	Ziyad			
Student Last Name	Amer			
DateOfBirth	January 4, 2024	...	12:00am	
School Email	zksm@psu.edu			
Phone Number	2345			

Delete confirmation

Are you sure you want to Delete?

Dorm CRUD

	Student	Room	Staff	Assignment
Student_ID	4			
Student First Name	Ziyad			
Student Last Name	Amer			
DateOfBirth	January 4, 2024	...	12:00am	▼
School Email	zksm@psu.edu			
Phone Number	2345			

- Table Student After Delete:

Dorm CRUD

Student Room Staff Assignment

ID	First Name	Last Name	Date of Birth	School Email	Phone Number
1	Mostafa	Amer	2004-07-01 ...	mta5343@p...	267626700
2	vfb	dfbdgdb	2024-04-05 ...	dfbfd	bdfbdb
3	Omar	Tarek	2024-04-05 ...	omar@gmai...	267626700

Student_ID:

Student First Name:

Student Last Name:

DateOfBirth: January 4, 2023 12:00am

School Email:

Phone Number:

Insert Update Delete

INFO: Schema "DORMDB" is up to date. No migration necessary.
An existing Room was updated successfully!
An existing Staff was updated successfully!
An existing Assignment was updated successfully!
An existing Assignment was updated successfully!
A Student was deleted successfully!

Performed(ActionEvent evt)
nPerformed(ActionEvent evt)
ActionPerformed(ActionEvent evt)
Performed(ActionEvent evt)

2- Table Room Before delete:

Dorm CRUD

Student Room Staff Assignment

Room_ID	2	Room ID	Room Number	Room Type	Room Price
Room Number	97	1	21	dum	19
Room Type	Double	2	97	Double	1350

Room Type: Double
Room Price: 1350

Delete confirmation

Are you sure you want to Delete?

Insert Update Delete Yes No

Dorm CRUD

Student Room Staff Assignment

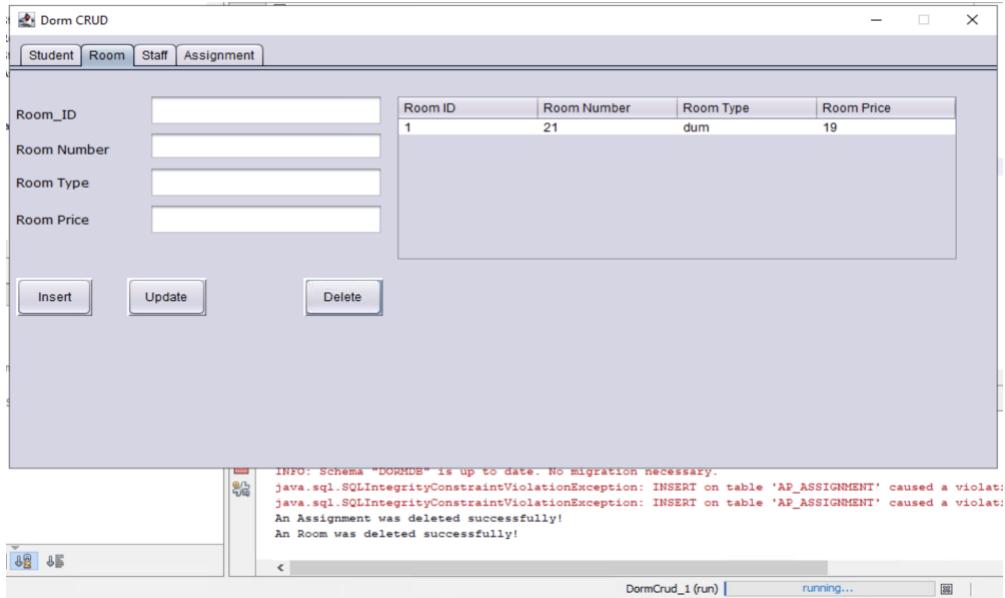
Room_ID	2	Room ID	Room Number	Room Type	Room Price
Room Number	97	1	21	dum	19
Room Type	Double	2	97	Double	1350

Room Type: Double
Room Price: 1350

Insert Update Delete

Apr 26, 2024 8:50:59 PM org.flywaydb.core.internal.command.DbMigrate logSummary

- Table Room after delete:



3- Table Staff before delete:

Dorm CRUD

Student Room Staff Assignment

Staff_ID	1	ID	First Na...	Last Na...	Hire Date	Position	Depart...	Phone ...	School ...
First Name	BOBO	1	BOBO	MOMO	2024-04...	YOYO	ZOZO	2020	7878
Last Name	MOMO	2	Mostafa	Amer	2024-04...	Machine...	AI	267626...	mta534...
Hire Date	April 3, 2024	3	Most	Am	2024-04...	Machine...	AI	267626...	mta534...

Delete confirmation

Are you sure you want to Delete?

Insert Update Delete

Dorm CRUD

Student Room Staff Assignment

Staff_ID	1	ID	First Na...	Last Na...	Hire Date	Position	Depart...	Phone ...	School ...
First Name	BOBO	1	BOBO	MOMO	2024-04...	YOYO	ZOZO	2020	7878
Last Name	MOMO	2	Mostafa	Amer	2024-04...	Machine...	AI	267626...	mta534...
Hire Date	April 3, 2024	3	Most	Am	2024-04...	Machine...	AI	267626...	mta534...

Insert Update Delete

- Table Staff after delete:

Dorm CRUD

Student Room Staff Assignment

ID	First Na...	Last Na...	Hire Date	Position	Depart...	Phone ...	School ...
2	Mostafa	Amer	2024-04-06	Machine...	AI	267626...	mta534...
3	Most	Am	2024-04-06	Machine...	AI	267626...	mta534...

Staff_ID
First Name
Last Name
Hire Date January 6, 0000 12:00am
Position
Department
Phone Number
School Email

Insert Update Delete

Assignment ID String DateAssigned int Shift

Apr 26, 2024 8:57:07 PM org.flywaydb.core.internal.command.DbMigrate logSummary
INFO: Schema "DORMDB" is up to date. No migration necessary.
An existing Staff was updated successfully!
A new Staff was inserted successfully!
An existing Assignment was updated successfully!
A Staff was deleted successfully!

4- Table Assignment before delete:

Dorm CRUD

Student Room Staff Assignment

Assignment_ID	Date Assigned	Student_ID	Room_ID	Staff_ID
2	2024-04-12 01:00am	1	1	3

Assignment_ID: 2
Date Assigned: April 12, 2024
Student_ID: 1
Room_ID: 1
Staff_ID: 3

Insert Update Delete

Delete confirmation

Are you sure you want to Delete?

Yes No

Dorm CRUD

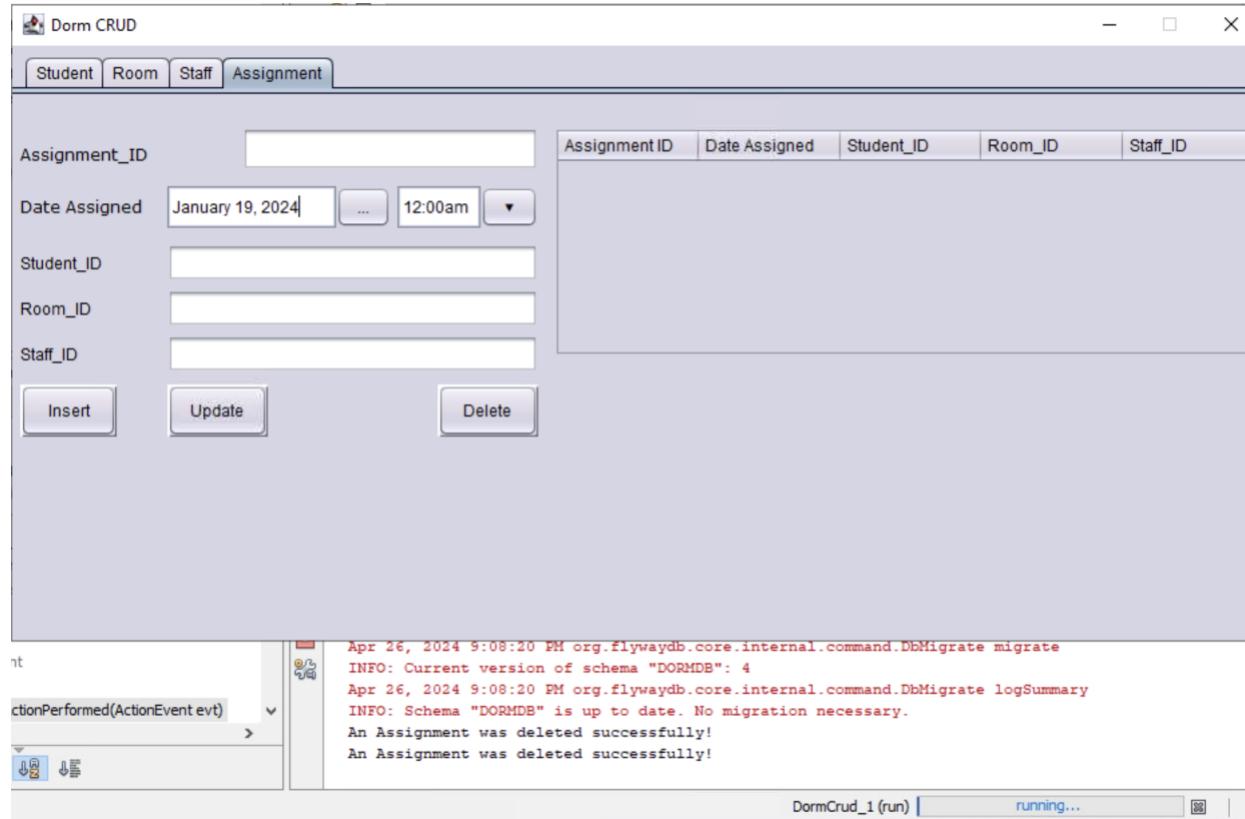
Student Room Staff Assignment

Assignment_ID	Date Assigned	Student_ID	Room_ID	Staff_ID
2	2024-04-12 01:00am	1	1	3

Assignment_ID: 2
Date Assigned: April 12, 2024
Student_ID: 1
Room_ID: 1
Staff_ID: 3

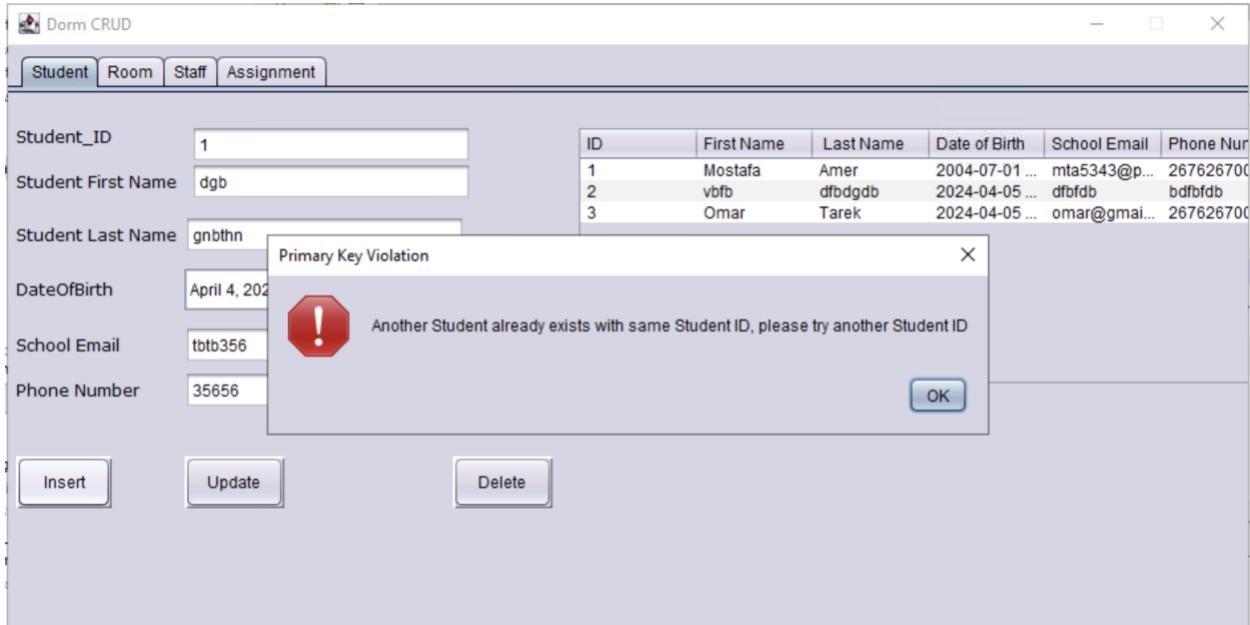
Insert Update Delete

- Table Assignment after delete:

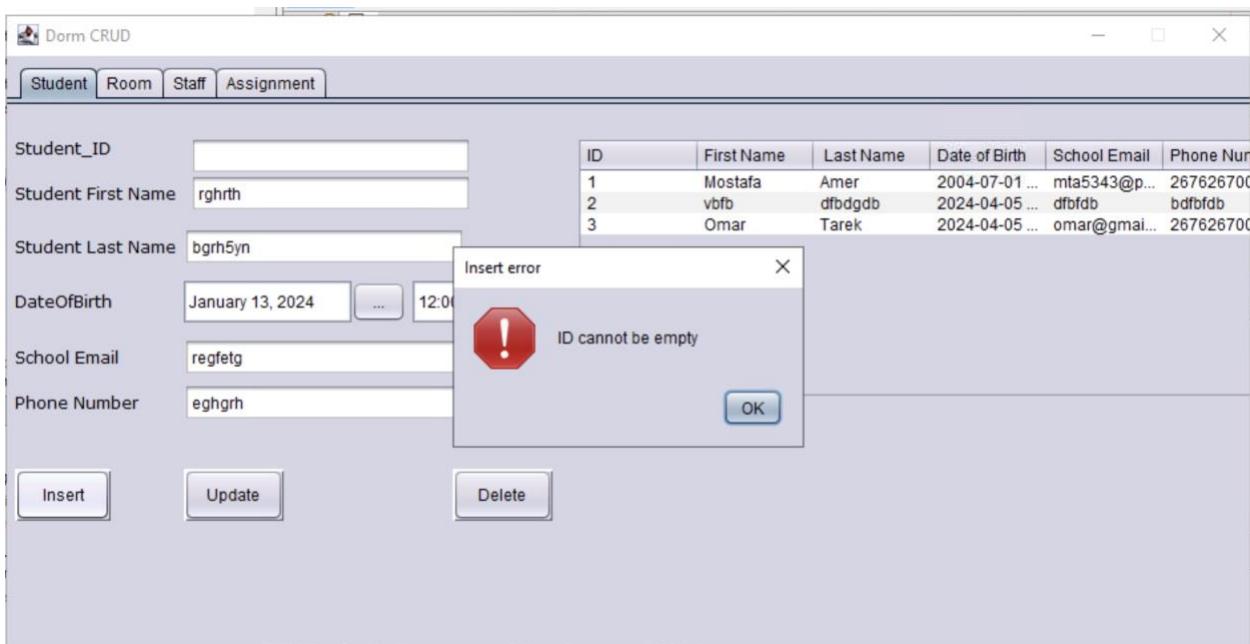


5. Show 5 different examples of error handling. Example errors: primary key violation, foreign key violation, empty field, data type error (writing a string text inside a field that only accepts integer), email validation (check if the data is actually in e-mail format), phone validation (check if the phone entered is in a correct format).

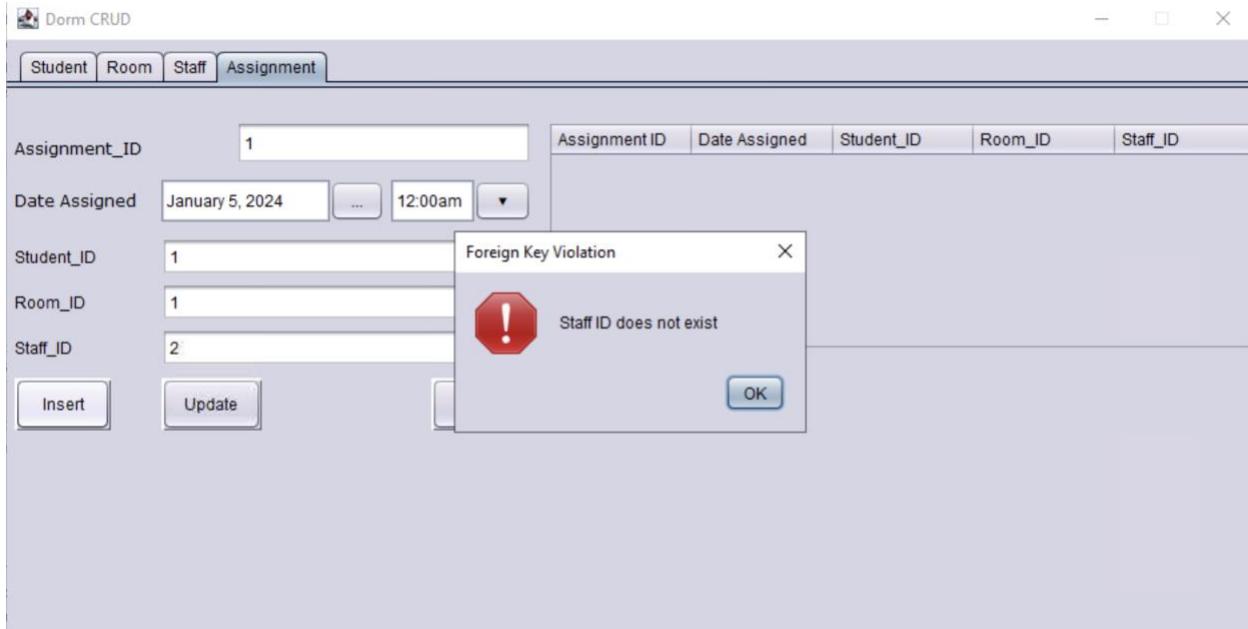
Primary key violation:



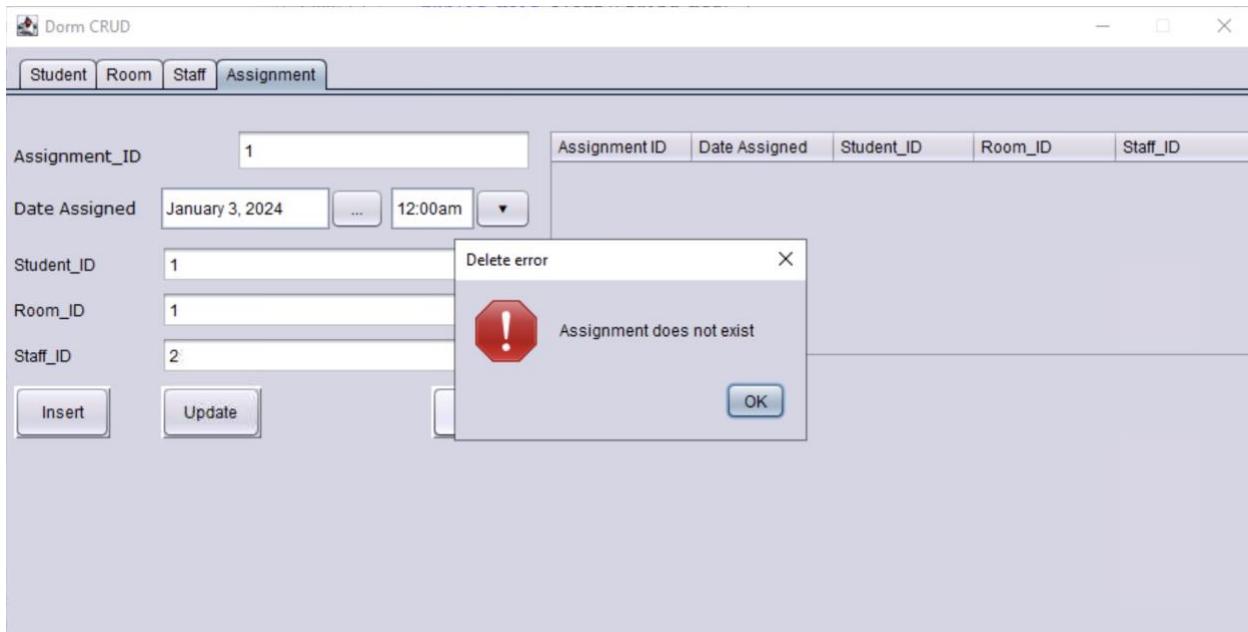
Empty ID error:



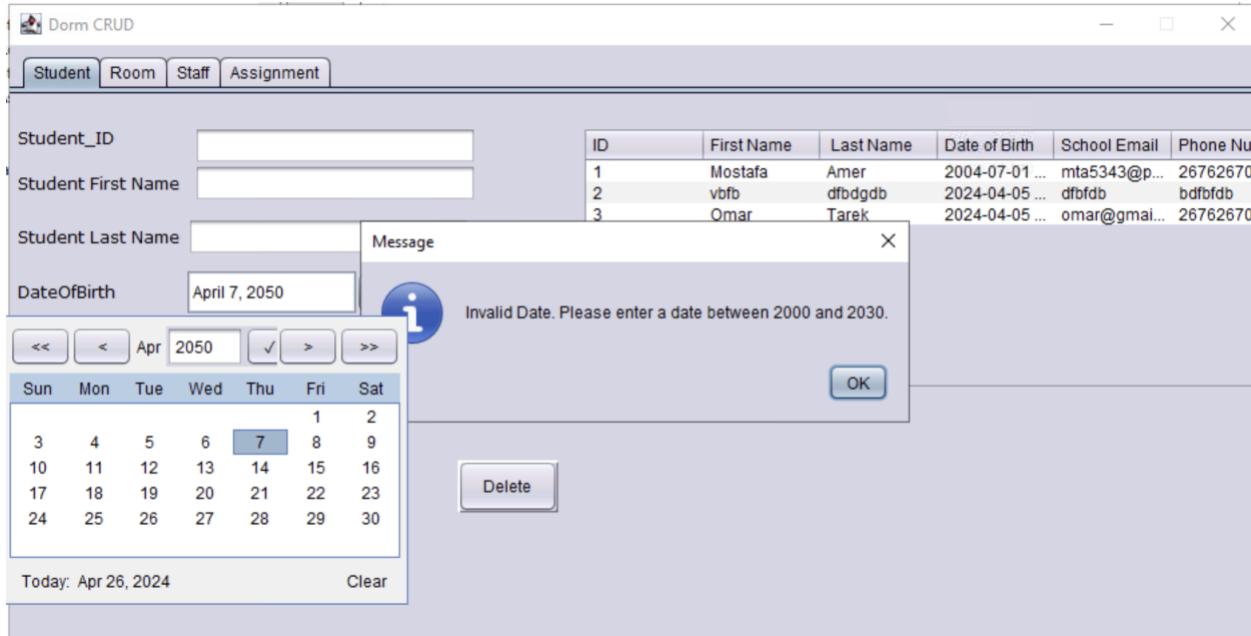
Foreign Key Violation:



Delete Error:



Date Value Error:



6. Show something unique about your project that does not exist in other student projects. This must be a unique thing for your application. You have to do a research and find an interesting thing to show in your application that makes your application unique. Some examples are using other JComponents (the ones we haven't discussed in class) in your application, using some charts or graphs in your application (showing demographics in pie chart, pie chart might be harder to do in a command line application), playing a video tutorial inside your application).
- My Unique idea is that a Student can be assigned or hired to be staff, as a part of an On-Campus Job.

That is Student:

Dorm CRUD

ID	First Name	Last Name	Date of Birth	School Email	Phone Number
1	Mostafa	Amer	2004-07-01 ...	mta5343@p... 2676267009	
2	vfbf	dfbdgdb	2024-04-05 ...	dfbfdb	bdfbfdb
3	Omar	Tarek	2024-04-05 ...	omar@gmai...	2676267009

Student_ID: 1
Student First Name: Mostafa
Student Last Name: Amer
DateOfBirth: July 1, 2004
School Email: mta5343@psu.edu
Phone Number: 2676267009

Insert Update Delete

That is The student's RoomID:

Dorm CRUD

Room ID	Room Number	Room Type	Room Price
1	19	Double	1300
2	21	EFERV	23542

Room_ID: 1
Room Number: 19
Room Type: Double
Room Price: 1300

Insert Update Delete

That is how you add a student as a part of the staff but is not assigned yet:

Dorm CRUD

	Student	Room	Staff	Assignment
Staff_ID	2			
First Name	Mostafa			
Last Name	Amer			
Hire Date	April 4, 2024	...	1:00am	▼
Position	Machine Learning Researcher			
Department	AI			
Phone Number	2676267009			
School Email	mta5343@psu.edu			

Buttons: Insert, Update, Delete

ID	First Na...	Last Na...	Hire Date	Position	Depart...	Phone ...	School ...
2	Mostafa	Amer	2024-04-	Machine...	AI	267626...	mta534...
3	Most	Am	2024-04-	Machine...	AI	267626...	mta534...
1	EFBGRB	RGBRGB	2024-04-	RGBNG...	NRN	245667	DFBFGN

This is how you assign the student to be a part of the staff and connect his ID with his room and staff ID to the assignment ID:

Dorm CRUD

	Student	Room	Staff	Assignment
Assignment_ID	1			
Date Assigned	January 3, 2024	...	12:00am	▼
Student_ID	1			
Room_ID	1			
Staff_ID	2			

Buttons: Insert, Update, Delete

Assignment ID	Date Assigned	Student_ID	Room_ID	Staff_ID
1	2024-01-03 00:00:00	1	1	2
2	2024-01-03 00:00:00	1	1	1

7. Find a user to test your application. Ask her/him to try to break your program (offer him/her a coffee if s/he breaks it). Write a paragraph about his/her user experience. What were the problems? What kind of suggestions did s/he give? Which updates did you do after the test?

I got my application crashed during the crash my application challenge because my tables allowed a negative value in the datetimepicker to be inserted.

So, I solved it by not allowing the user to enter any date that is not between the year 2000 and 2040, or in any wrong format.

