CS174a Project 3 Report – The Hospital

Task Division

Charles Weng

- Set up the JDBC and while loop through messages ResultSet
- UI for initial load database (database selection, user name)
- Updating patient information
- Debugged NULL table values and threw error messages for constraint violations
- Last two queries of Admin interface

Cameron McNair

- Prepared statements inside the Hospital class
- UI for initial load database (password field)
- UI for the three interfaces
- Viewing the patient information
- Viewing and editing Allergy information
- First two queries of Admin interface

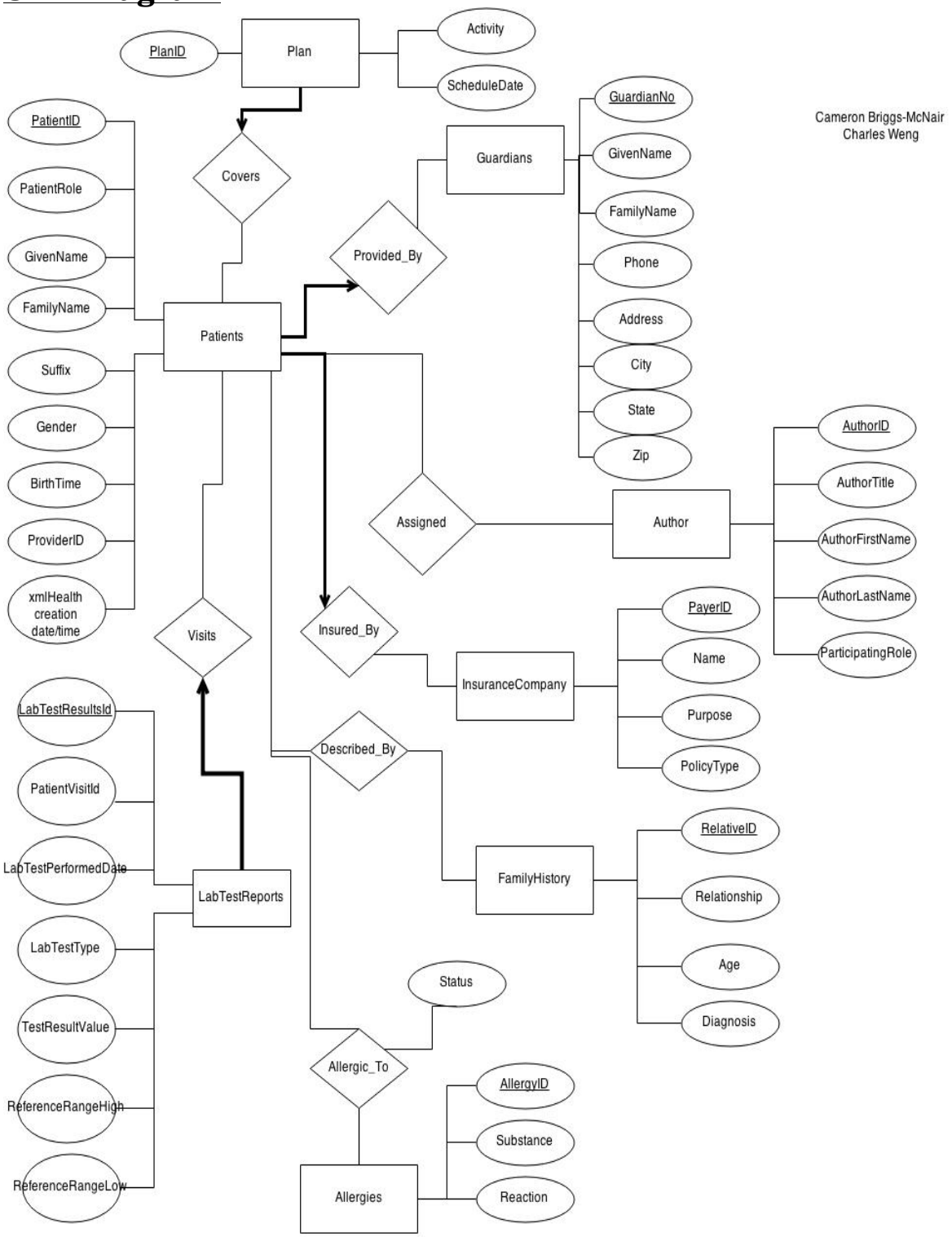
Parts of Schemas that Changed Since Project 2

- Changed the primary key from a tuple of (LabTestResultId, PatientVisitId) to just PatientVisitId, because LabTestResults cannot exist without a patient visit
- We deleted some NOT NULL's due to the fact that some values can be NULL inside our table
- We added and moved some Foreign Key Constraints
- Moved Status inside our UML diagram to our Allergic_To
- Added several more constraints like Unique, Foreign Key, etc.

How We Dealt With Constraints

- Constraints such as Primary Key Constraints are outputted to the console
- Foreign Key Constraints are outputted onto the stack trace

UML Diagram



Cameron Briggs-McNair
Charles Weng

Final Schema Definitions

Formatted for easier readability!

```
CREATE TABLE IF NOT EXISTS guardians
  (
     guardianno INT,
     firstname  CHAR(100),
     lastname   CHAR(50),
     phone      CHAR(20),
     address    CHAR(100),
     city       CHAR(50),
     state      CHAR(20),
     zip        INT,
     PRIMARY KEY(guardianno)
  );

CREATE TABLE IF NOT EXISTS insurancecompany
  (
     payerid    INT,
     name       CHAR(50),
     purpose    CHAR(50),
     policytype CHAR(50),
     PRIMARY KEY(payerid)
  );

CREATE TABLE IF NOT EXISTS author
  (
     authorid          INT,
     authortitle       CHAR(100),
     authorfirstname   CHAR(50),
     authorlastname    CHAR(50),
     participatingrole CHAR(50),
     PRIMARY KEY(authorid)
  );

CREATE TABLE IF NOT EXISTS labtestreports
  (
     labtestresultsid     INT,
     patientvisitid       INT,
     labtestperformeddate DATETIME,
     labtesttype          CHAR(50),
     testresultvalue      INT,
     referencerangehigh   CHAR(50),
     referencerangelow    CHAR(50),
     PRIMARY KEY(labtestresultsid),
     UNIQUE(labtestresultsid, patientvisitid)
  );
CREATE TABLE IF NOT EXISTS patient
  (
     patientid                 INT,
     patientrole               INT,
     givenname                 CHAR(100),
     familyname                CHAR(50),
     suffix                    CHAR(10),
     gender                    CHAR(8),
     birthtime                 DATETIME,
     providerid                CHAR(50),
     xmlhealthcreationdatetime DATETIME,
     payerid                   INT,
     PRIMARY KEY(patientid),
```

```
    FOREIGN KEY(patientrole) REFERENCES guardians(guardianno),
    FOREIGN KEY(payerid) REFERENCES insurancecompany(payerid)
  );

CREATE TABLE IF NOT EXISTS assigned
  (
    patientid INT,
    authorid  INT,
    PRIMARY KEY(patientid, authorid),
    FOREIGN KEY(patientid) REFERENCES patient(patientid),
    FOREIGN KEY(authorid) REFERENCES author(authorid)
  );
CREATE TABLE IF NOT EXISTS familyhistory
  (
    relativeid   INT,
    relationship CHAR(50),
    age          INT,
    diagnosis    CHAR(100),
    PRIMARY KEY(relativeid)
  );
CREATE TABLE IF NOT EXISTS describedby
  (
    patientid  INT,
    relativeid INT,
    PRIMARY KEY(patientid, relativeid),
    FOREIGN KEY(patientid) REFERENCES patient(patientid),
    FOREIGN KEY(relativeid) REFERENCES familyhistory(relativeid)
  );
CREATE TABLE IF NOT EXISTS allergies
  (
    allergyid INT,
    patientid INT NOT NULL,
    substance CHAR(50),
    reaction  CHAR(50),
    status    CHAR(20),
    PRIMARY KEY(allergyid),
    FOREIGN KEY(patientid) REFERENCES patient(patientid)
  );
CREATE TABLE IF NOT EXISTS plan
  (
    planid       INT,
    activity     CHAR(50),
    scheduledate DATETIME,
    patientid    INT NOT NULL,
    PRIMARY KEY(planid),
    FOREIGN KEY(patientid) REFERENCES patient(patientid)
  );
CREATE TABLE IF NOT EXISTS visits
  (
    patientvisitid   INT,
    patientid        INT,
    labtestresultsid INT,
    PRIMARY KEY(patientvisitid),
    FOREIGN KEY(patientid) REFERENCES patient(patientid),
    FOREIGN KEY(labtestresultsid) REFERENCES labtestreports(labtestresultsid)
  );
```

Queries Used

Note: '?' represents things that can be replaced depending on other factors in a query

Patient

- Update Patient set GivenName = ?, FamilyName = ?, Suffix = ?, Gender = ?, Birthtime = ?, ProviderID = ?, PayerID = ? where PatientID = ?
- select * from (Patient join Guardians on Patient.PatientRole = Guardians.GuardianNo) where PatientId = ?
- select * from Patient where PatientID = ?

Doctor

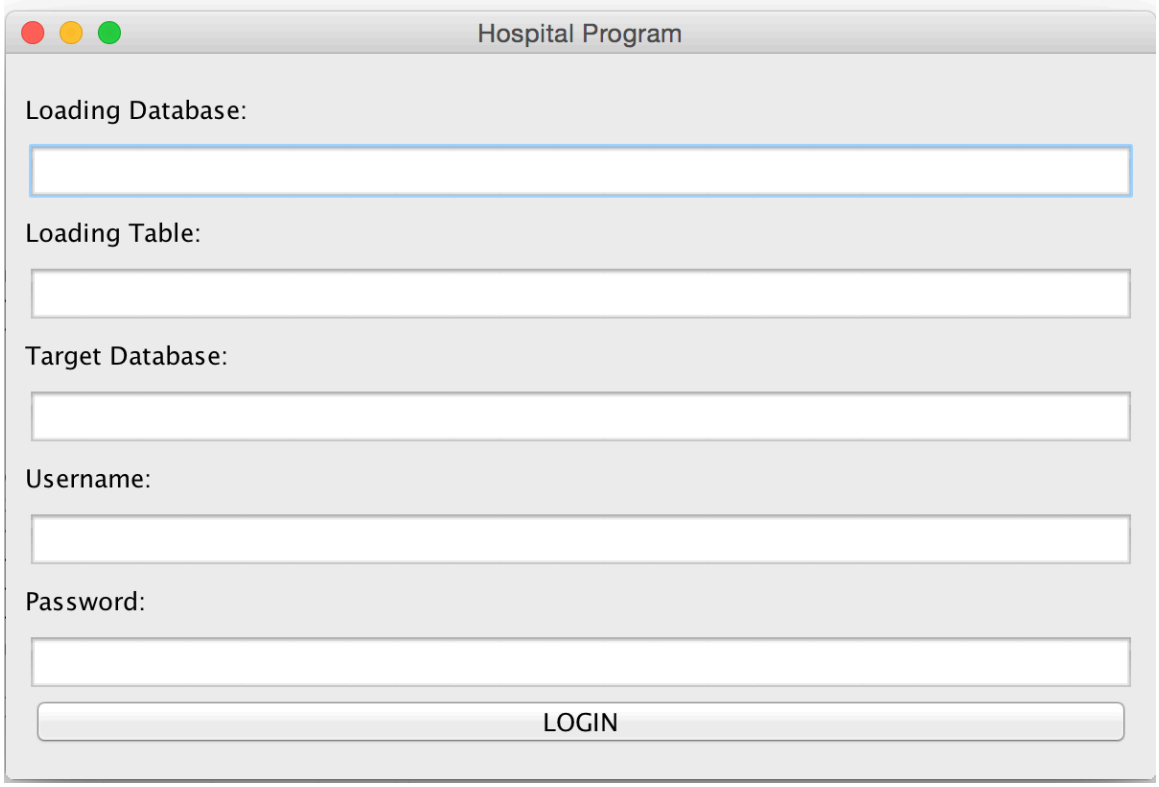
- Update Allergies set Substance = ?, Reaction = ?, Status = ? where PatientID = ?
- select * from Allergies where PatientID = ?
- select * from Plan where PatientID = ?

Administrator

- select count(*) from (SELECT distinct(substance) from allergies where substance is not null group by substance) a
- select distinct(substance), count(*) from allergies where substance is not null group by substance
- select PatientID, count(*) from allergies group by PatientID having count(*) > 1
- select count(*) from (select a.PatientID, count(*) from allergies a group by a.PatientID having count(*) > 1) AS MultiAllergy
- select * from Plan pl, Patient pt where pl.PatientID = pt.PatientID and DATE(pl.ScheduleDate) = DATE(CURDATE())
- select a.AuthorID, a.AuthorTitle, a.AuthorFirstName, a.AuthorLastName, a.ParticipatingRole from Author a where a.AuthorID in (select AuthorID from Assigned group by AuthorID having count(*) > 1)

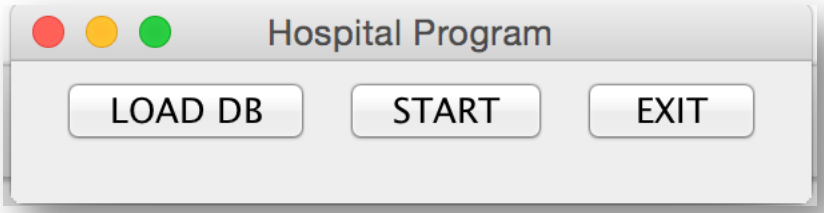
UI Description

Login Screen - Initial login screen that preloads your database into your code

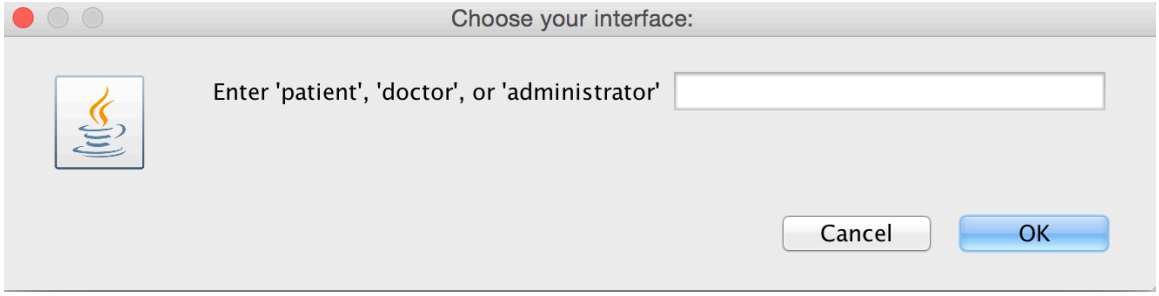


Main Menu

- Loads the DB given and puts it into our DB
- Start our Java Program that allows to edit and change info about Patients
- Exit exits our Main Menu



Interface Selection Menu – Choose Patient, Doctor, or Admin UI



Patient and Doctor Interfaces – Figure 1 => Enter Patient ID
Figure 2 => View, Edit, Exit a Patient's Info
Figure 3 => View
Figure 4 => Edit

Figure 1.

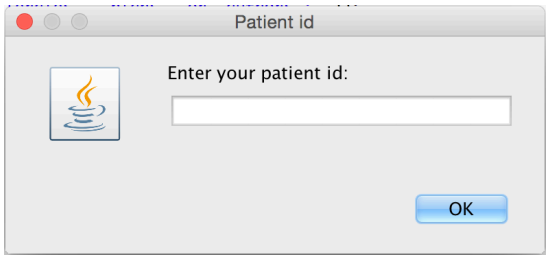


Figure 2.

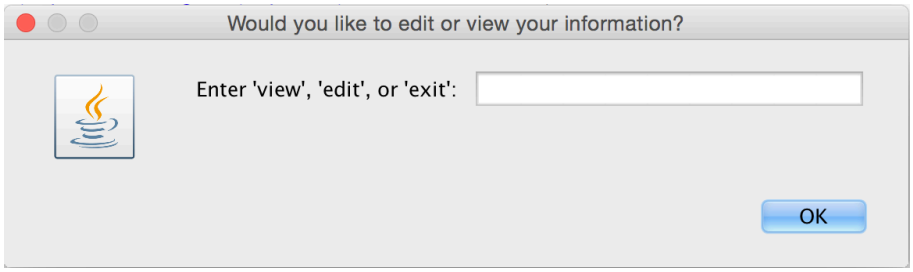


Figure 3.

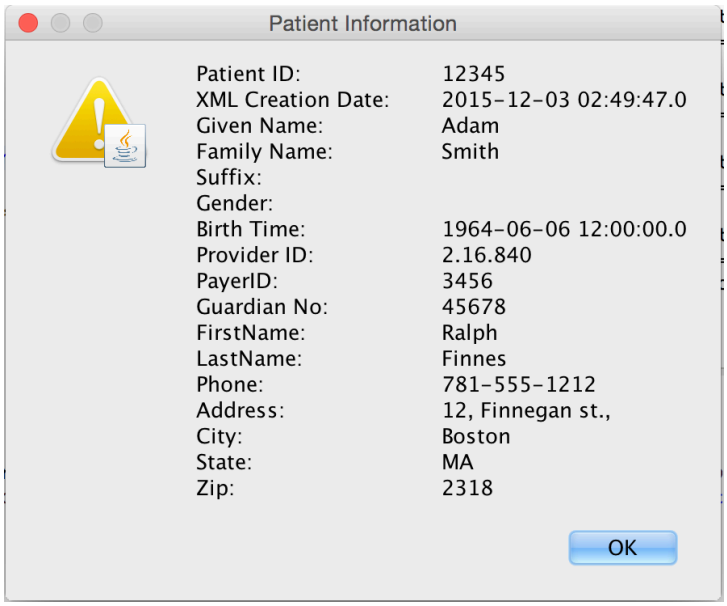
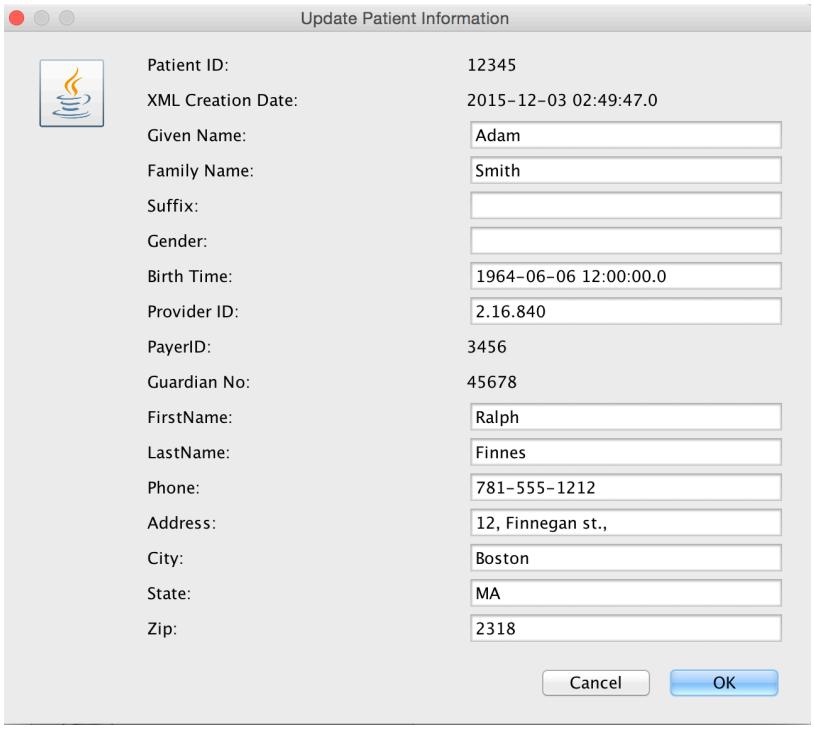


Figure 4.



Admin Interface – Figure 1 => Four different types of views we can choose from
Figure 2 => Querying for counts of allergies of each
Figure 3 => Patients with multiple Allergies
Figure 4 => Plans for today
Figure 5 => Authors with multiple patients assigned

Figure 1.

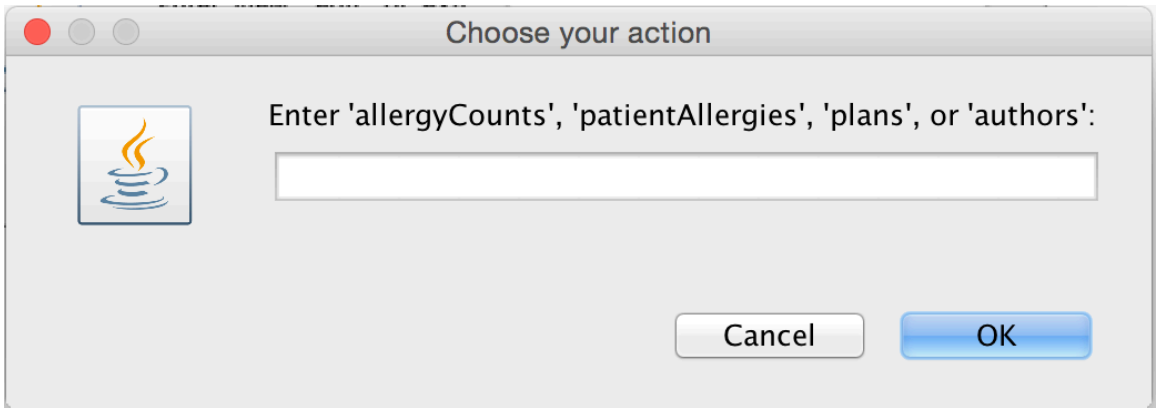


Figure 2.

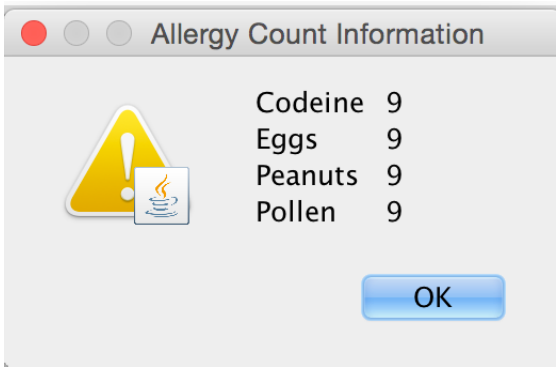


Figure 3.

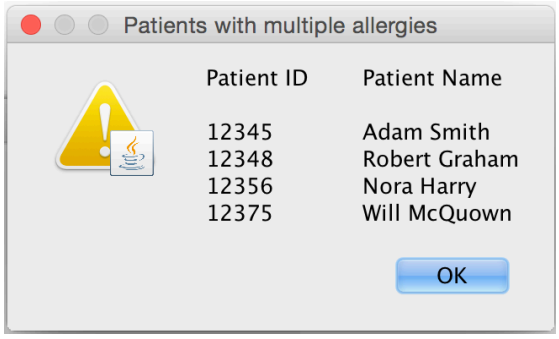


Figure 4.

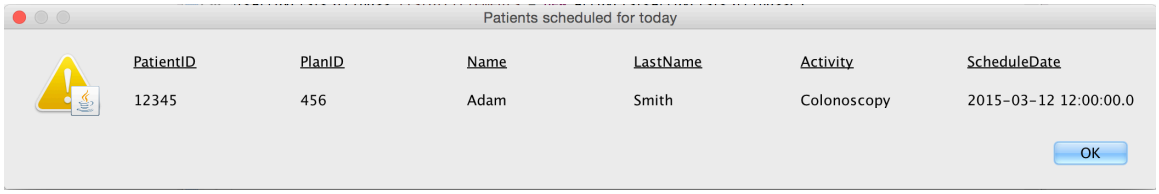
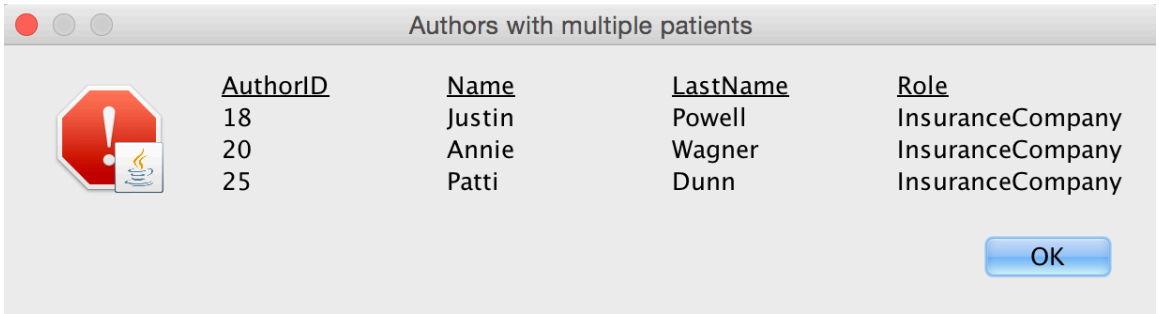


Figure 5.



Classes and Methods Implemented

Classes	Methods
MainMenu	MainMenu constructor – set up our UI resetFrame – logic for loading db vs ui doInterface – choosing between admin, patient, doctor main – main thread where our ui is running
Hospital	Hospital constructor – loading db stuff into our own database notNull – if null for primary keys we don't insert into certain ones of our table
PatientInterface	PatientInterface – Choosing between view and edit patient info
DoctorInterface	DoctorInterface – choosing between viewing allergy counts and allergy info for each patient
AdminInterface	AdminInterface – combined querying and selections on admin
Patient	Patient – place where all the queries are made
Doctor	Doctor – place where all allergy queries are made