Milestone # 4 - Database Design File

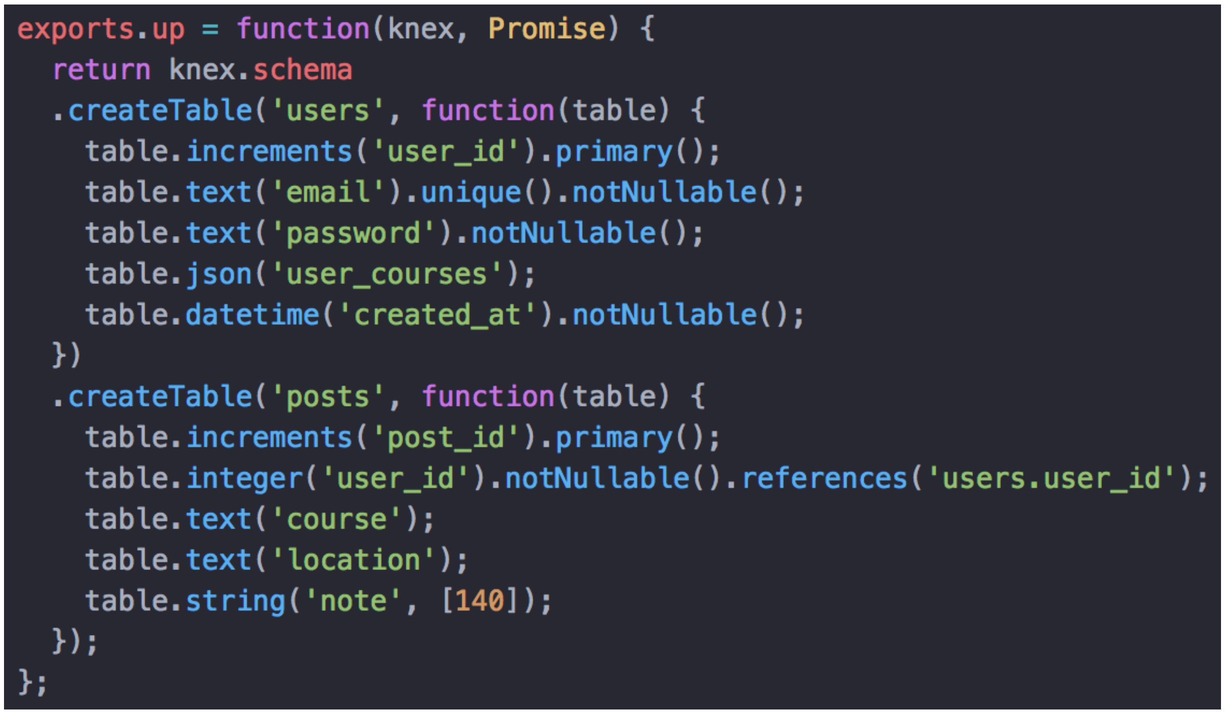
Team Name: Midsummer Night's Team

Members: Justin Adkins, Jamison McGinley, Jennifer Gurtler, Julien Rumsey, Shania Roy, Parikshit Bhetwal

Database Software, and Database Creation Scripts:

We chose to use PostgreSQL for our DBMS, utilizing PgAdmin3/4 as a tool to visualize the data as well as to query our data once it was seeded. We have two tables in our database. One that holds user information for registering/authentication and another for data created by the user on a session to session basis. This second table will be relatively volatile, and the data added to it will be deleted if the user signs out or selects to remove it from the site.

For all of our queries done within our code we have used a JavaScript query builder utility called Knex.js. Knex takes PostgresSQL calls and translates them into functional JavaScript that we can use in our code. One of the utilities Knex provides is the ability to migrate tables into our database and "seed" them with data provided in a JavaScript file. The code below is a snippet from one of our migration files to give you an idea of how it works.



```
exports.up = function(knex, Promise) {
  return knex.schema
  .createTable('users', function(table) {
    table.increments('user_id').primary();
    table.text('email').unique().notNullable();
    table.text('password').notNullable();
    table.json('user_courses');
    table.datetime('created_at').notNullable();
  })
  .createTable('posts', function(table) {
    table.increments('post_id').primary();
    table.integer('user_id').notNullable().references('users.user_id');
    table.text('course');
    table.text('location');
    table.string('note', [140]);
  });
};
```

Once this code is implemented, we simply execute the command:

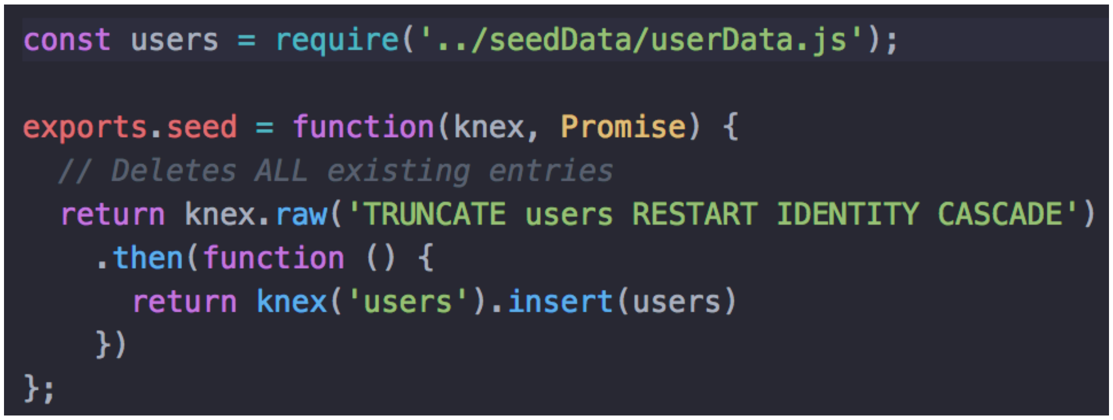
```
knex migrate:latest
```

This will build the table in our connected database (if it doesn't already exist). The PostgresSQL query translation, for reference, of the above would be:

```
CREATE TABLE public.users
(
    user_id integer NOT NULL DEFAULT nextval('users_user_id_seq'::regclass),
    email text COLLATE pg_catalog."default" NOT NULL,
    password text COLLATE pg_catalog."default" NOT NULL,
    user_courses json,
    created_at timestamp with time zone NOT NULL,
    CONSTRAINT users_pkey PRIMARY KEY (user_id),
    CONSTRAINT users_email_unique UNIQUE (email)

)
```

To seed our table with data, we then use a separate file that contains the following.



```
const users = require('../seedData/userData.js');

exports.seed = function(knex, Promise) {
  // Deletes ALL existing entries
  return knex.raw('TRUNCATE users RESTART IDENTITY CASCADE')
    .then(function () {
      return knex('users').insert(users)
    })
};
```

With how this code is currently written, it allows us to wipe the *entire* database and re-seed with ease. A "users" object is imported which is an array of JSON objects that contain user data. We then execute the command to send the queries to the database which will pull from all of our seed files:

```
knex seed:run
```

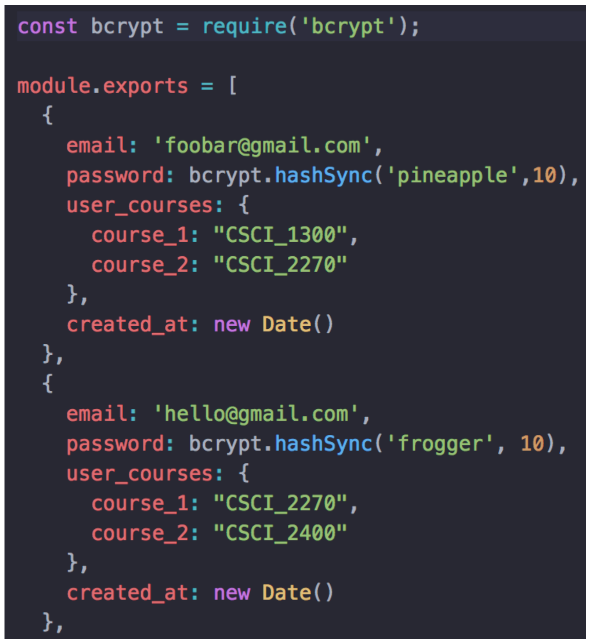
We have a very similar seed file for our second table and to avoid redundancy I'll leave it to the reader to take a look in our GitHub if they'd like to see the code.

Since we are using knex to populate our database our PostgreSQL scripts are wrapped in JavaScript to make for easy implementation with our data and server. For more information on knex, and how it translates functions to scripts please visit knex.js.

Our database files including test data, migration (table creation / recreation), and seed files can all be found at https://github.com/CSCI-3308-Project/CSCI_3308Project/tree/master/serverSide/db.

You will find **userData.js** and **postData.js** within the **seedData** directory at the path specified above. These two files contain our initial test data to populate our tables.

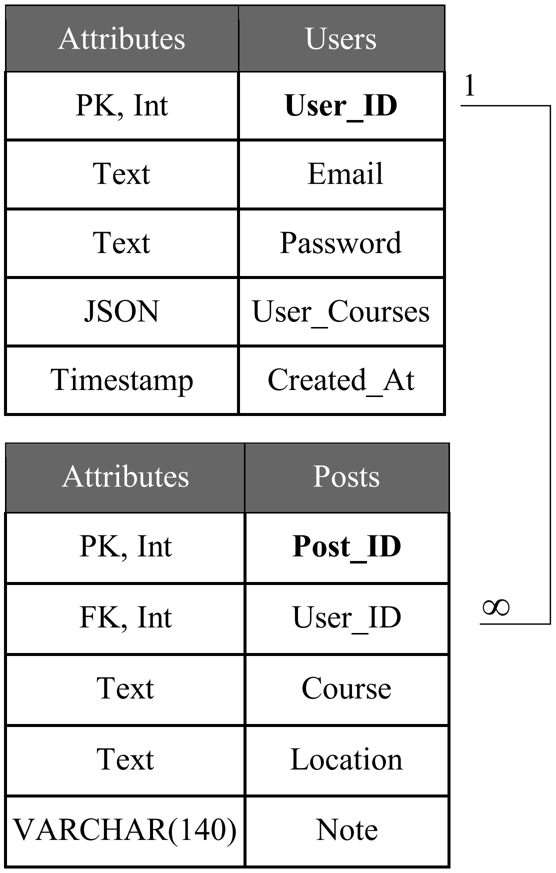
The snippet below is from userData.js to give the reader some insight on these files:



```
const bcrypt = require('bcrypt');

module.exports = [
  {
    email: 'foobar@gmail.com',
    password: bcrypt.hashSync('pineapple',10),
    user_courses: {
      course_1: "CSCI_1300",
      course_2: "CSCI_2270"
    },
    created_at: new Date()
  },
  {
    email: 'hello@gmail.com',
    password: bcrypt.hashSync('frogger', 10),
    user_courses: {
      course_1: "CSCI_2270",
      course_2: "CSCI_2400"
    },
    created_at: new Date()
  },
```

The data model below depicts our two tables and their relation to one another. They are linked by a User_ID primary key in the first table with a User_ID foreign key in the second. The diagram shows how one "User" can have multiple posts, but each post must belong to only one user. Our attribute types are listed on the left.



Attributes	Users
PK, Int	**User_ID**
Text	Email
Text	Password
JSON	User_Courses
Timestamp	Created_At

Attributes	Posts
PK, Int	**Post_ID**
FK, Int	User_ID
Text	Course
Text	Location
VARCHAR(140)	Note