



CAPSTONE PROJECT PROPOSAL

SUBMITTED BY: VANCE MORGAN 000384251

MORGAN, VANCE

SUMBITTED ON: APRIL 11, 2019



## Table of Contents

<b>Background</b> .....	<b>3</b>
Technologies .....	3
<b>Functionality Chart</b> .....	<b>4</b>
<b>Wireframes</b> .....	<b>5</b>
<b>Entity Relationship Diagram</b> .....	<b>19</b>
Database Table Details.....	20
<b>Test Plan</b> .....	<b>20</b>
<b>Deliverable Timeline</b> .....	<b>23</b>

## Table of Figures

<b>Figure 1 – Landing Page</b> .....	<b>5</b>
<b>Figure 2 – Sign Up Page</b> .....	<b>6</b>
<b>Figure 3 – Login Page</b> .....	<b>7</b>
<b>Figure 4 – Recover Password Page</b> .....	<b>8</b>
<b>Figure 5 – Home Page</b> .....	<b>9</b>
<b>Figure 6 – Profile Page</b> .....	<b>10</b>
<b>Figure 7 – Song Maker Page/ Change Tool Screen</b> .....	<b>11</b>
<b>Figure 8 – Save Song Screen</b> .....	<b>12</b>
<b>Figure 9 – Compositions Page</b> .....	<b>13</b>
<b>Figure 10 – Favorites Page</b> .....	<b>14</b>
<b>Figure 11 – Admin Home Page</b> .....	<b>15</b>
<b>Figure 12 – Admin Profile Page</b> .....	<b>16</b>
<b>Figure 13 – Admin Page</b> .....	<b>17</b>
<b>Figure 14 – Admin Song Maker Page</b> .....	<b>18</b>



## Project Background

The idea for my project is a web application centered around a music theory database. This would be an SQL database containing information regarding scales, modes and chords. The app would allow multiple users to sign into their accounts and create, read update or delete records from their “favourites”. Admin accounts would have the extra privilege of introducing new scales/chords to the database as well as deleting users. Aside from the basic database functionality, it would also suggest the next step in the phrase by using an algorithm to help with song writing. The user is then able to accept this suggestion or reject it and request another one. Once, done a composition (ordered set of notes or chords), the user can save this and open it at a later date.

This suggestion feature would be an asset to those with absolutely no musical background. Being a bedroom music producer, I know just how valuable a free solution to music theory and song writing could be for any aspiring musician.

## Technologies

The languages and framework that I will use to develop this web-based application are:

**Prototyping and UI Design:** Balsamiq Wireframes

**Front End:** HTML5, CSS3, JavaScript, jQuery, Bootstrap

**Back End:** PHP, Node.js

**IDE:** NetBeans, Visual Studio 2017

**Database:** MySQL

**Testing:** Selenium Web Recorder

**Browsers:** Chrome, Internet Explorer, Firefox

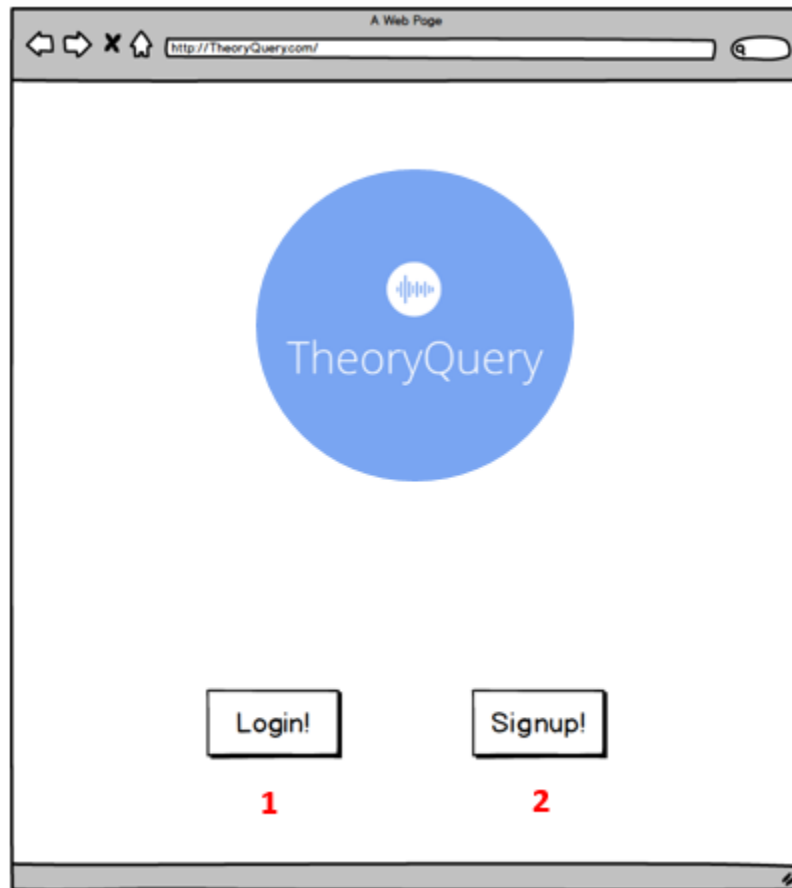
**Source Code Repository:** Git and GitHub



## Functionality

FUNCTIONALITY	USER	ADMIN
<b>SIGN-UP</b>	X	
<b>LOGIN</b>	X	X
<b>FORGOT PASSWORD</b>	X	X
<b>CREATE NEW USER</b>		X
<b>VIEW PROFILE PAGE</b>	X	X
<b>CREATE NEW RECORD</b>		X
<b>VIEW A RECORD</b>	X	X
<b>LISTEN TO RECORD</b>	X	X
<b>ADD TAG TO RECORD</b>	X	X
<b>REMOVE TAG FROM RECORD</b>	X	X
<b>SEARCH RECORD BY ROOT</b>	X	X
<b>SEARCH RECORD BY NAME</b>	X	X
<b>SEARCH RECORD BY TAG</b>	X	X
<b>SEARCH RECORD BY TYPE</b>	X	X
<b>ADD RECORD TO FAVOURITES</b>	X	
<b>REMOVE RECORD FROM FAVORITES</b>	X	
<b>VIEW FAVOURITES PAGE</b>	X	
<b>VIEW NEXT-STEP SUGGESTION</b>	X	X
<b>ACCEPT SUGGESTION</b>	X	X
<b>REQUEST NEW SUGGESTION</b>	X	X
<b>SAVE COMPOSITION</b>	X	
<b>OPEN COMPOSITION</b>	X	
<b>DELETE COMPOSITION</b>	X	
<b>PROMOTE TO ADMIN</b>		X
<b>LOGOUT</b>	X	X
<b>DELETE USER</b>	X	X
<b>CORE FUNCTIONALITY</b>		

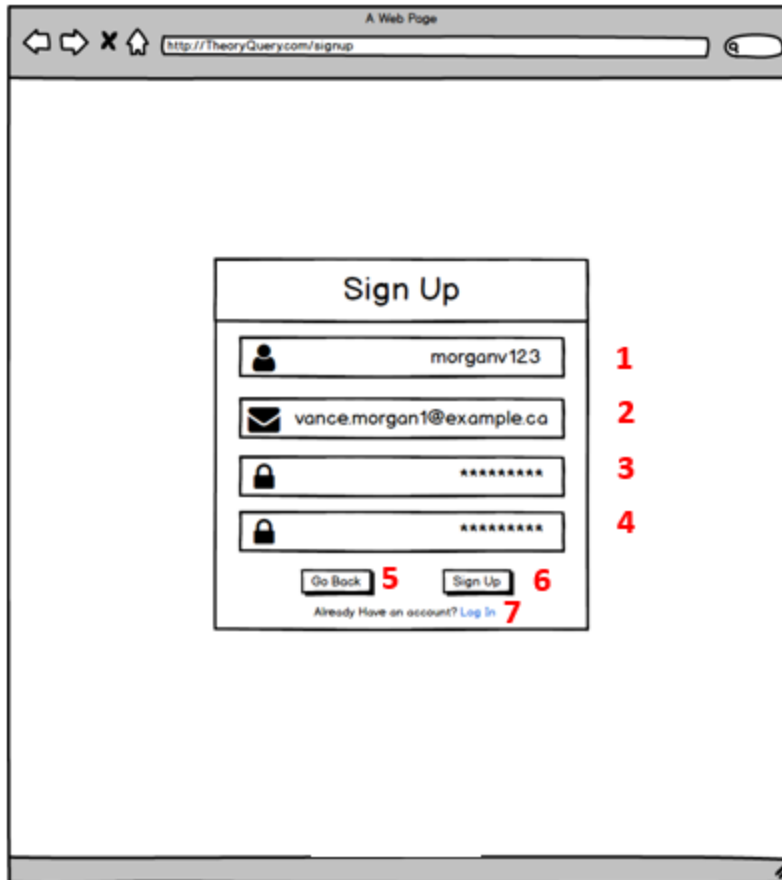
\*Record refers to either a scale, chord or mode



**Figure 1 - Landing Page**

This will be the users first impression of my site. My goal is to display an aesthetically pleasing layout containing brand information as well as options to login or signup.

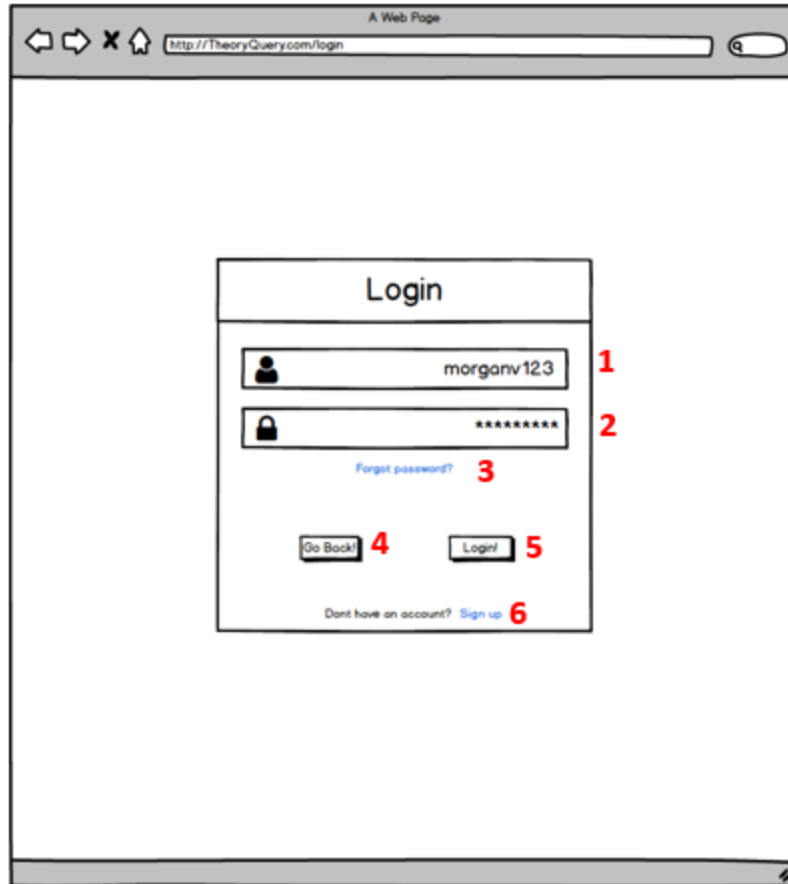
1. Login button will take the user to the login page.
2. Signup button will take the user to the signup screen where they can create an account.



**Figure 2 - Sign Up Page**

This page allows for the user to create an account for TheoryQuery.com.

1. Text input allows user to enter their username.
2. Text input that allows user to enter their email.
3. Text input that allows user to enter their password.
4. Text input that allows user to confirm their password.
5. Go back button links back to the landing page.
6. Sign Up Button validates correct input and creates an account for the user. It then links to the user's home page.
7. Log In link will take the user to the login screen.



**Figure 3 - Login Page**

This page will allow users who have already signed up, to easily login to their accounts.

1. Text input allows user to enter their username.
2. Text input that allows user to enter their password.
3. Links user to the forgot password page to allow for account recovery.
4. Go back button links back to the landing page
5. Login button will verify the user's credentials and either notify them of errors in input or take the user to their home page.
6. The signup link will take the user to the signup page.



A Web Page

http://TheoryQuery.com/recover

### Recover Password

An email will be sent to you containing your account info

1

2

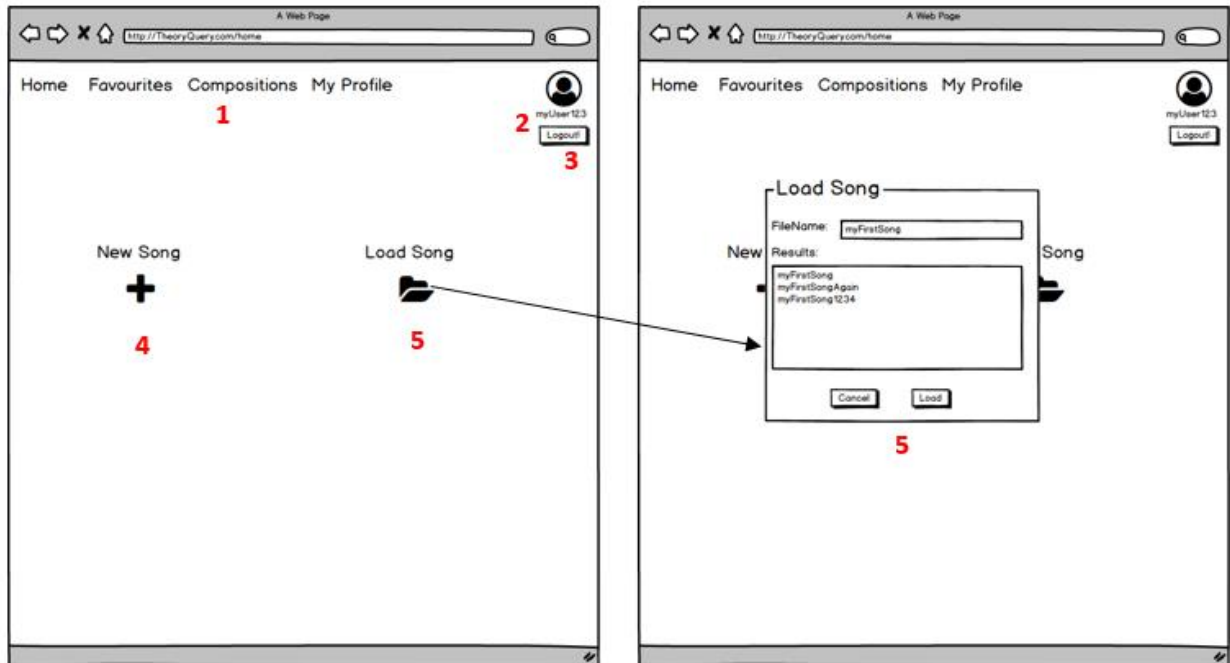
Don't have an account? [Sign up](#) 3

**Figure 4 - Recover Password Page**

This page allows for the user to recover an account of theirs if they have forgotten the password. It will send the user an email containing account info.

1. Text input allows user to enter their email address.
2. Send Button verifies that the email is affiliated with an account and then sends an email to that address.
3. Sign up link will take the user to the signup page.

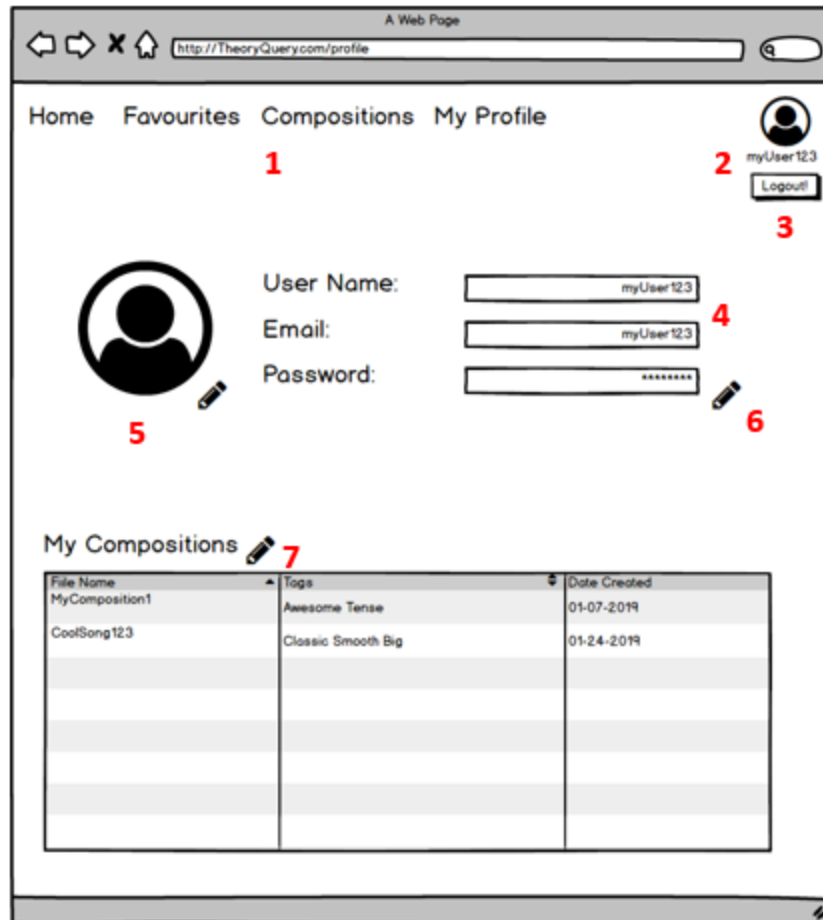




**Figure 5 - Home Page**

This page allows for the user to access the many pages and functions of TheoryQuery.

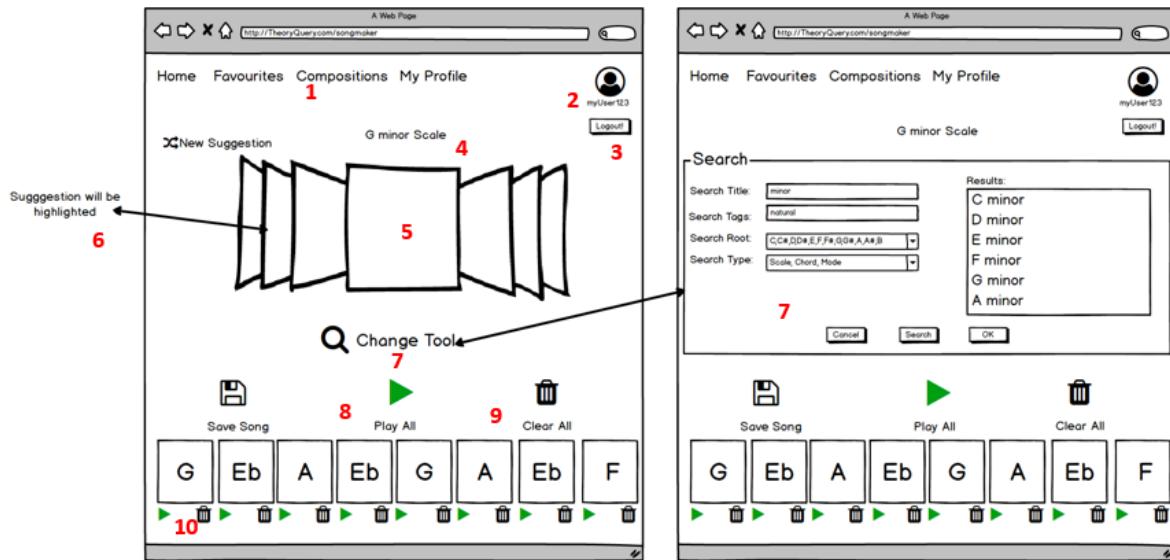
1. The navigation menu will allow for the user to jump to their Home, Favourites, Compositions and Profile page.
2. Clicking the users Photo or username will also take the user to their profile page.
3. The logout button under users Photo will sign the current user out and load the landing page.
4. New Song Button will take the user to the song maker page with an empty template loaded.
5. Load Song button will open a dialog allowing the user to search for a saved composition and open it.



**Figure 6 - Profile Page**

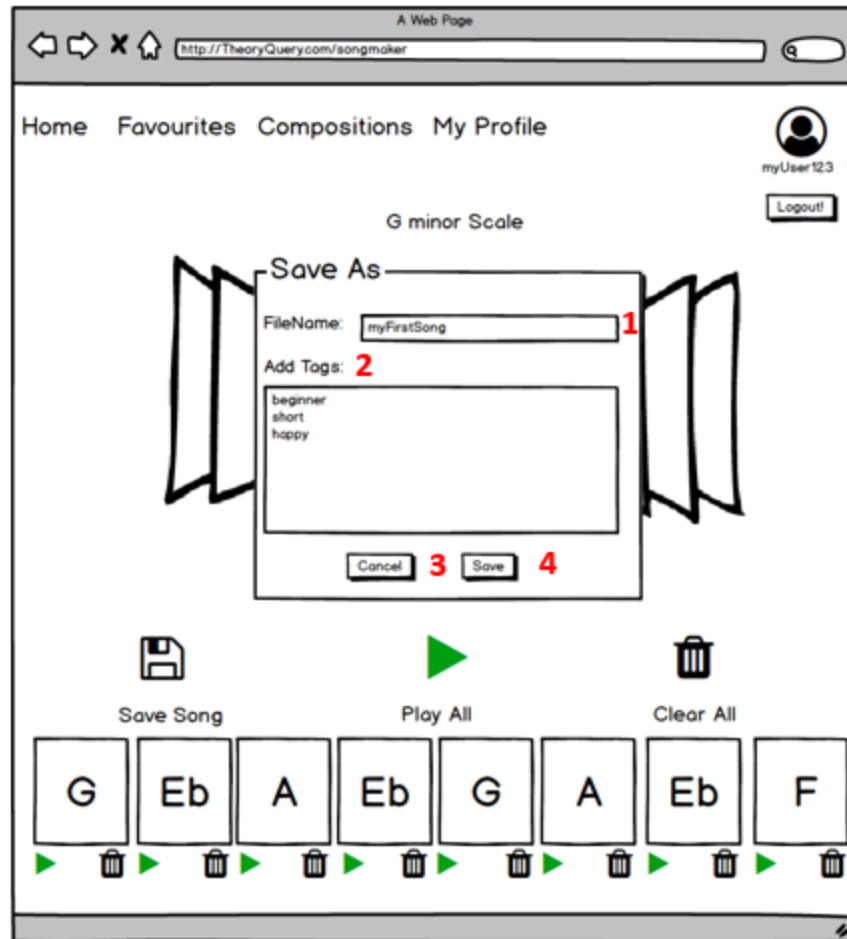
This page allows the user to view and edit their account details.

1. The navigation menu will allow for the user to jump to their Home, Favourites, Compositions and Profile page.
2. Clicking the users Photo or username will also take the user to their profile page.
3. The logout button under users Photo will sign the current user out and load the landing page.
4. Display shows current values and in order to edit the user must click the pencil icon.
5. Edit photo will open a photo load dialog
6. Edit string values will clear the text view and allow for a new value to be entered.
7. Editing the compositions table will take the user to the compositions page.



**Figure 7 - Song Maker Page & Change Tool Screen**

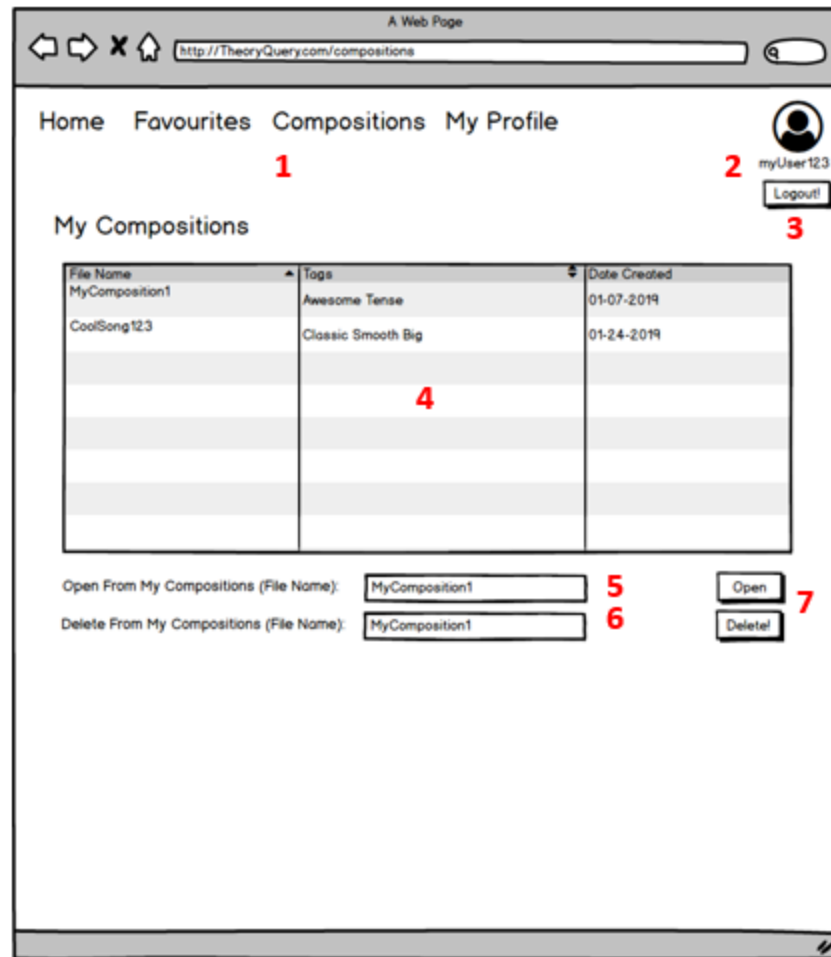
1. The navigation menu will allow for the user to jump to their Home, Favourites, Compositions and Profile page.
2. Clicking the user's photo or username will also take the user to their profile page.
3. The logout button under users Photo will sign the current user out and load the landing page.
4. The title will represent the currently selected tool
5. The deck view will display the notes/chords contained in the currently selected tool.
6. The suggested next step will be highlighted, and the user can generate a new suggesting by clicking the new suggestion link.
7. The change tool button will open a dialog allowing the user to search through all records by Title, Tags, Root or Type.
8. The large Play button allows for the user to play the entire song in its current state.
9. The large delete button allows the user to delete/clear the current song.
10. The smaller play and delete buttons refer to their respective steps (delete or play each specific step).



**Figure 8 - Save Song Screen**

This screen is loaded when the user clicks the save song button on the song maker page. It allows the user to save the state of their song.

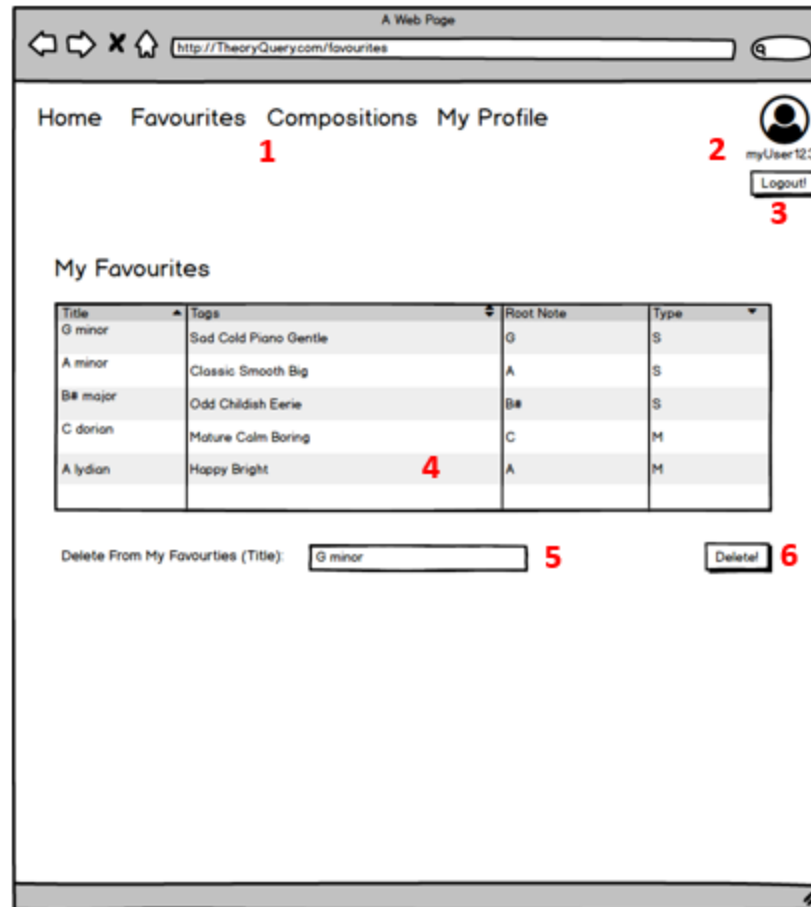
1. Text input allows user to name their song.
2. Text field allows user to add tags to their song.
3. Cancel button will close the dialog window.
4. Save button will create a new saved file containing song information and then close the dialog.



**Figure 9 - Compositions Page**

This page allows for the user to view, open or delete their saved songs/compositions.

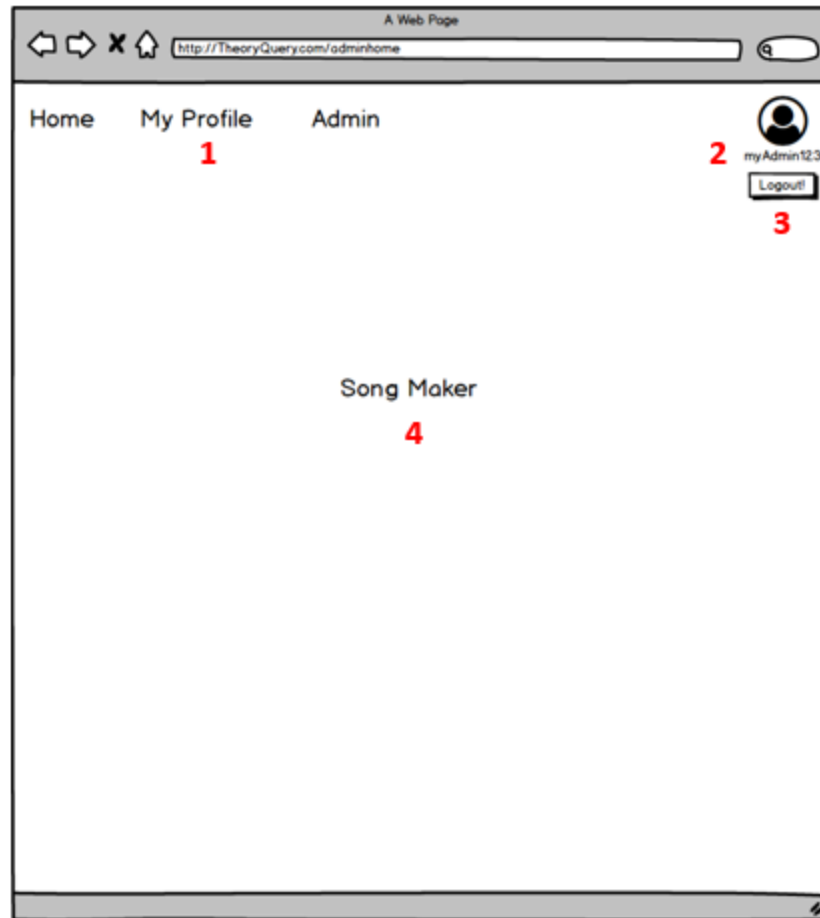
1. The navigation menu will allow for the user to jump to their Home, Favourites, Compositions and Profile page.
2. Clicking the user's photo or username will also take the user to their profile page.
3. The logout button under users Photo will sign the current user out and load the landing page.
4. Table displays a sorted list of saved compositions.
5. Text Input allows user to enter the name of file to be opened.
6. Text Input allows user to enter the name of file to be deleted.
7. Delete/Open buttons validate that file exists and then deletes or opens it



**Figure 10 - Favourites Page**

This page allows for the user to view and delete records in their favourites.

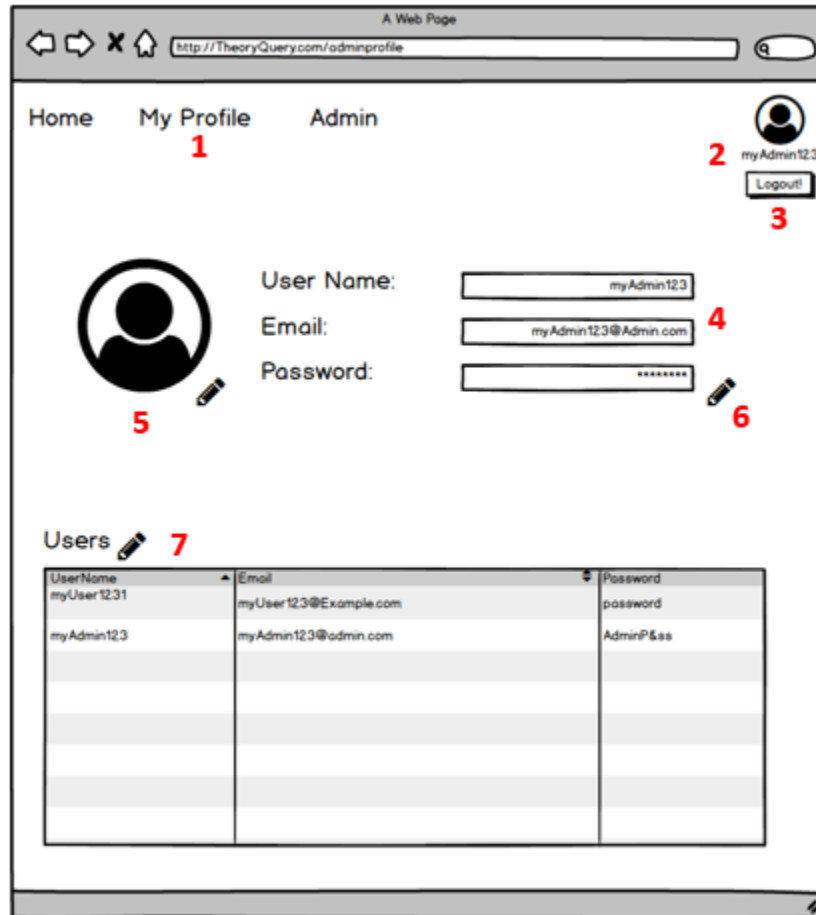
1. The navigation menu will allow for the user to jump to their Home, Favourites, Compositions and Profile page.
2. Clicking the users Photo or username will also take the user to their profile page.
3. The logout button under user's photo will sign the current user out and load the landing page.
4. Table displays a sorted list of user's favourites.
5. Text input allows user to enter the name of record to be removed from favourites.
6. Delete button will validate that record exists in favourites and then remove it.



**Figure 11 - Admin Home Page**

This is the home page for an Admin account. It allows the admin to access their privileges and to carry out actions that regular users cannot access.

1. The navigation menu will allow for the admin to jump to their Home, Profile, and Admin pages.
2. Clicking the admin's photo or username will also take the admins to their profile page.
3. The logout button under admin's photo will sign the current user out and load the landing page.
4. The Song Maker button will take the admin to the admin Song Maker page which is slightly different from the users Song Maker.



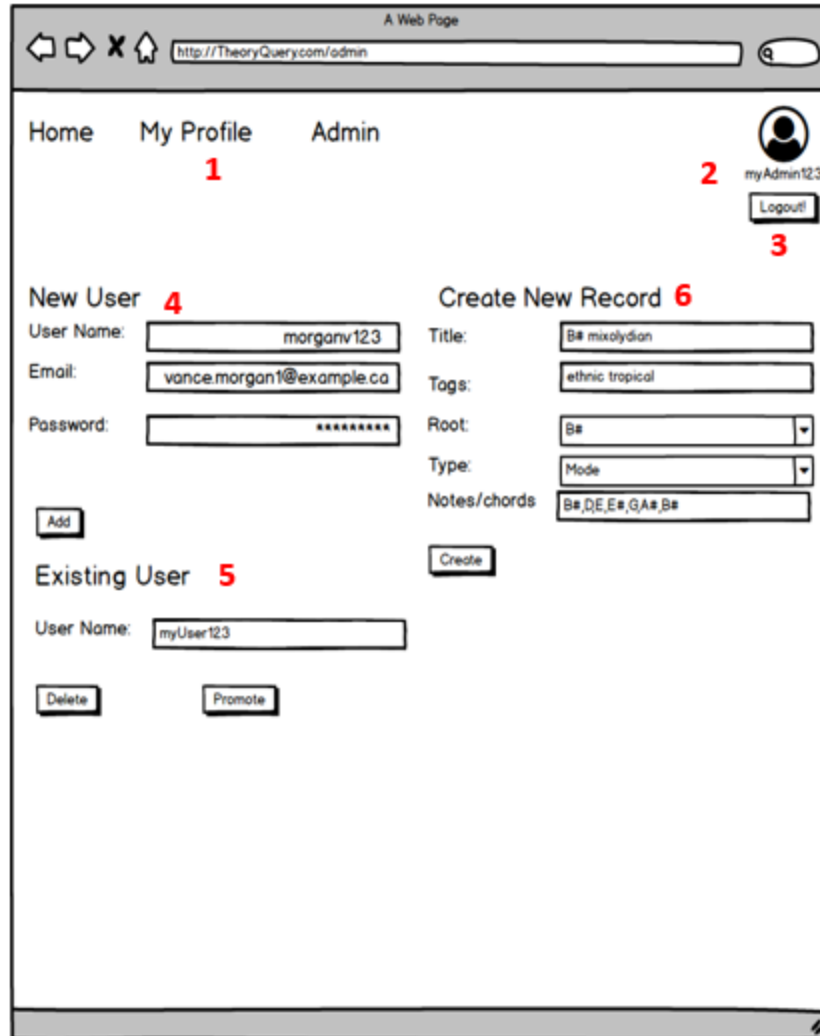
The screenshot shows a web browser window titled "A Web Page" with the URL "http://TheoryQuery.com/adminprofile". The page has a navigation menu with "Home", "My Profile", and "Admin". The "My Profile" link is highlighted with a red "1". In the top right corner, there is a user profile section with a photo icon (labeled "2"), the username "myAdmin123" (labeled "3"), and a "Logout!" button. Below this, there is a form for editing the user's profile. It includes a photo icon (labeled "5") with a pencil icon next to it, and three text input fields: "User Name:" (containing "myAdmin123"), "Email:" (containing "myAdmin123@Admin.com"), and "Password:" (containing "\*\*\*\*\*"). Each input field has a pencil icon next to it (labeled "6"). Below the form, there is a "Users" section (labeled "7") with a pencil icon. This section contains a table with three columns: "UserName", "Email", and "Password". The table has two rows of data: one for "myUser1231" with email "myUser123@Example.com" and password "password", and another for "myAdmin123" with email "myAdmin123@admin.com" and password "AdminP&ss".

**Figure 12 - Admin Profile Page**

This page is very similar to the user's profile page. It allows the admins to view and edit their account info.

1. The navigation menu will allow for the admin to jump to their Home, Profile, and Admin pages.
2. Clicking the admin's photo or username will also take the admins to their profile page.
3. The logout button under admin's photo will sign the current user out and load the landing page.
4. Display shows current values and in order to edit the admin must click the pencil icon.
5. Edit photo will open a photo load dialog
6. Edit string values will clear the text view and allow for a new value to be entered.
7. Edit users will take admin to admin page.



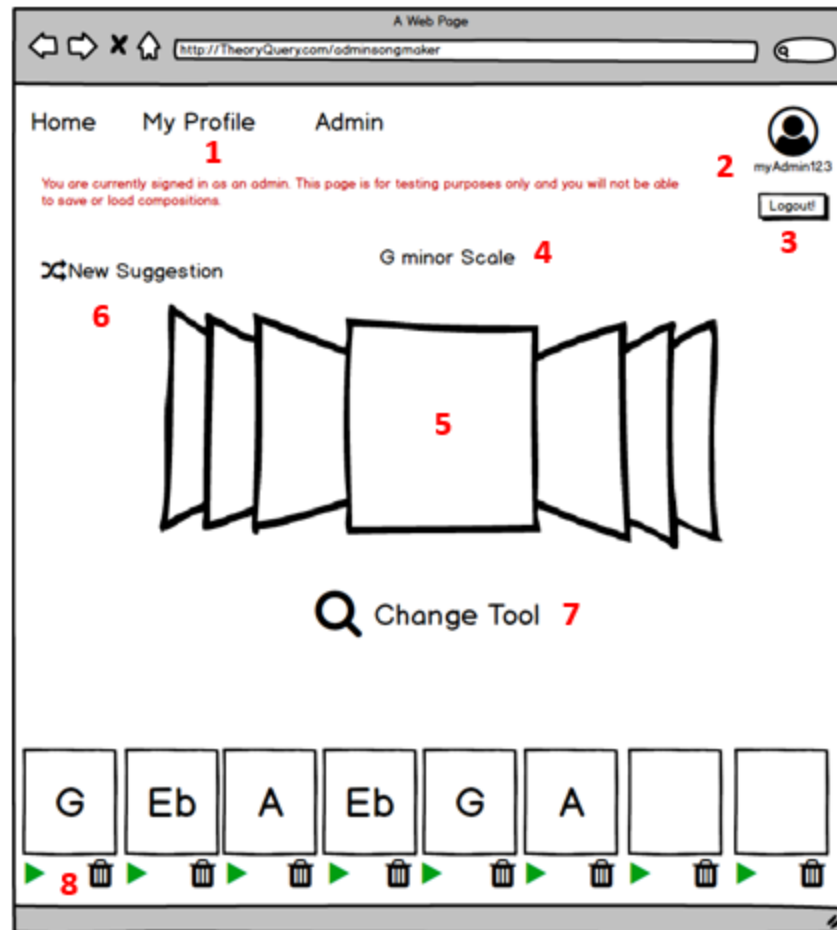


The screenshot shows a web browser window titled "A Web Page" with the URL "http://TheoryQuery.com/admin". The page has a navigation menu at the top with links for "Home", "My Profile", and "Admin". A red number "1" is placed below the "My Profile" link. On the right side, there is a user profile section with a circular icon, the username "myAdmin123", and a "Logout!" button. A red number "2" is placed above the icon, and a red number "3" is placed below the "Logout!" button. The main content area is divided into two columns. The left column is titled "New User" with a red number "4" and contains input fields for "User Name:" (filled with "morgan123"), "Email:" (filled with "vance.morgan1@example.ca"), and "Password:" (filled with "\*\*\*\*\*"). Below these fields is an "Add" button. The right column is titled "Create New Record" with a red number "6" and contains input fields for "Title:" (filled with "B# mixolydian"), "Tags:" (filled with "ethnic tropical"), "Root:" (a dropdown menu with "B#" selected), "Type:" (a dropdown menu with "Mode" selected), and "Notes/chords" (filled with "B# D# E# G# A# B#"). Below these fields is a "Create" button. At the bottom of the left column, there is a section titled "Existing User" with a red number "5" and an input field for "User Name:" (filled with "myUser123"). Below this field are "Delete" and "Promote" buttons.

**Figure 13 - Admin Page**

This page allows the admins to regulate and update the system/database. It allows them to add, delete or promote a user. It also allows them to add new records to the system.

1. The navigation menu will allow for the admin to jump to their Home, Profile, and Admin pages.
2. Clicking the admin's photo or username will also take the admins to their profile page.
3. The logout button under admin's photo will sign the current user out and load the landing page.
4. The new user input fields allow the admin to create a new user by inputting its credentials.
5. The existing user input field allows the admin to delete or promote an existing user by inputting its user name.
6. The new record input fields allow for an admin to create and introduce new records to the database.



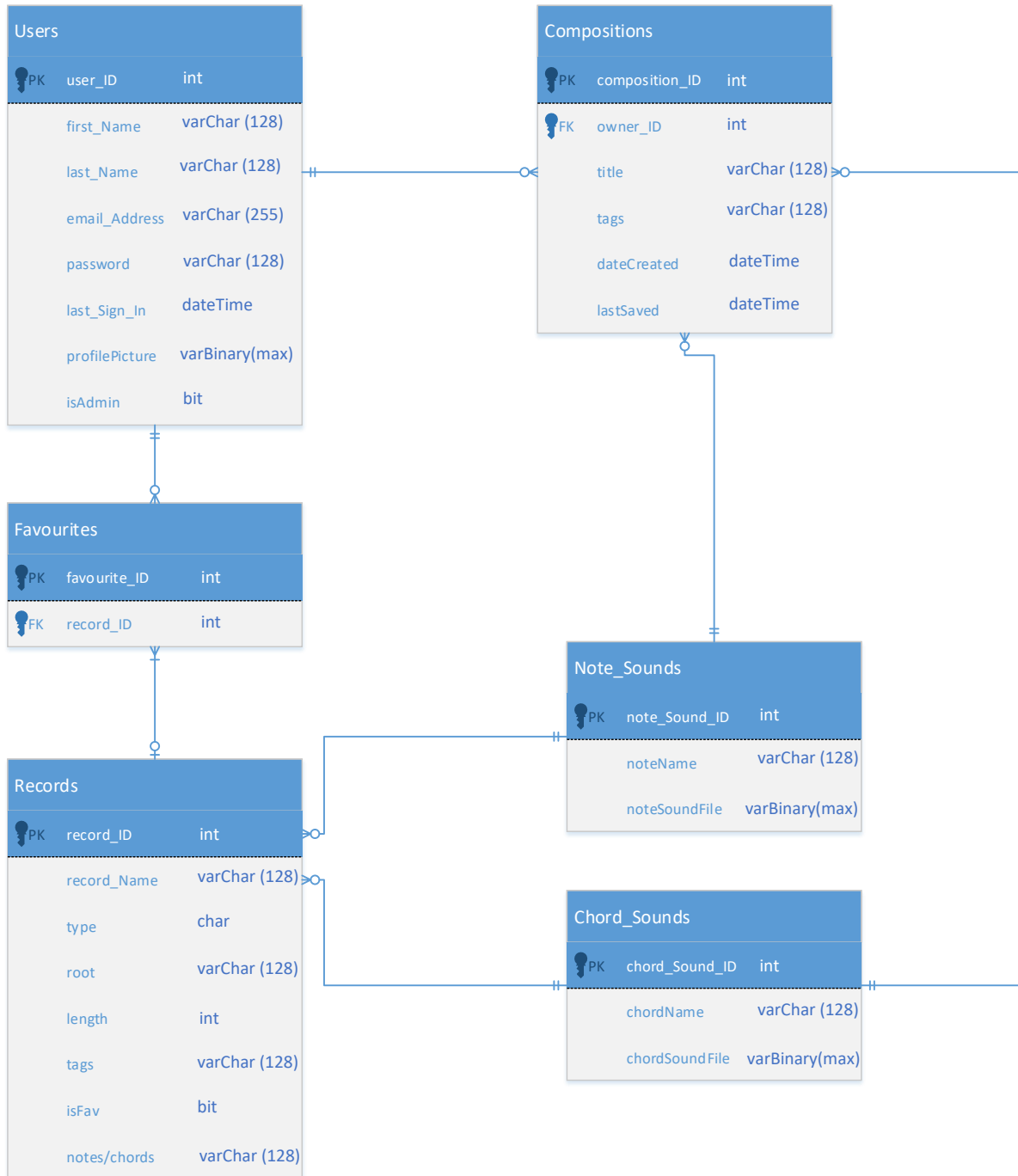
**Figure 14- Admin Song Maker Page**

This page is like the user's song maker page, but it does not allow for saving. The primary purpose of this page is debugging and testing the suggestion feature.

1. The navigation menu will allow for the admin to jump to their Home, Profile, and Admin pages.
2. Clicking the admin's photo or username will also take the admins to their profile page.
3. The logout button under admin's photo will sign the current user out and load the landing page.
4. The title will represent the currently selected tool
5. The deck view will display the notes/chords contained in the currently selected tool.
6. The suggested next step will be highlighted, and the user can generate a new suggesting by clicking the new suggestion link.
7. The change tool button will open a dialog allowing the user to search through all records by Title, Tags, Root or Type.
8. The smaller play and delete buttons refer to their respective steps (delete or play each specific step).



## Entity Relationship Diagram





## Database Table Details

FUNCTIONALITY	DESCRIPTION
USERS	Contains each user's registration info and credentials
COMPOSITIONS	Holds every composition created by the system
FAVOURITES	Contains the user's favourite records
RECORDS	Holds all records currently available in the system
NOTE_SOUNDS	Contains sound files to be played for a specific note
CHORD_SOUNDS	Contains sound files to be played as a chord

## Test Plan

The main functionality for this web application will be tested using Selenium Web Recorder. By creating automated test suites, one can quickly run through a variety of unit tests and validation checks. Further unit tests may be required to validate JavaScript and PHP functions. My tests will validate the following functionality to ensure the product meets agreed upon requirements.

### Registration

#### PASS

- Test input validation
- Test that email is sent to newly created user
- Test that successful registration logs user in, adds them to database, and grants them the required privileges

#### FAIL

- Test that invalid username is not allowed
- Test that invalid email is not allowed
- Ensure they are not added to database or given any privileges

### Log In/ Log Out

#### PASS

- Test input validation
- Test successful login
- Test successful log out

#### FAIL

- Test invalid login credentials
- Ensure user is not logged into system



## Password Recovery

### PASS

- Test that email with instructions and reset link is sent to user's email
- Test that password reset link works

### FAIL

- Invalid email should not send email
- Page should notify user of error

## User Role

### PASS

- Ensure user can create a new composition
- Ensure user can save an existing composition
- Ensure user can load an existing composition
- Ensure user can add a record to their favourites
- Ensure user can hear a record
- Ensure user can hear their composition

### FAIL

- Ensure user cannot access admin privileges
- User should not be able to add or delete records

## Admin Role

### PASS

- Test that admin can create a new user
- Test that admin can create a new record
- Test that admin can delete an existing user
- Test that admin can promote a user to admin

### FAIL

- Ensure an admin cannot save or load compositions
- Ensure admin cannot access favorites functionality

## Favourites

### PASS

- Test that favourites can be removed



### Profile Edit

PASS

- Test that a user can edit their profile picture to valid image
- Test that admin can edit their profile picture to valid image
- Test that user can change their user name, email or password with valid input
- Test that admin can change their user name, email or password with valid input

FAIL

- Test that a user can edit their profile picture to valid image
- Test that admin can edit their profile picture to valid image
- Test that user can change their user name, email or password with valid input
- Test that admin can change their user name, email or password with valid input

### Record Search

PASS

- Test that correct records are displayed when search is entered

FAIL

- Ensure that invalid searches do not return results and an appropriate error is displayed

### Compatibility

PASS

- Ensure that user experience is standard on the aforementioned browsers (Chrome, IE, Firefox)



## Deliverables Timeline

WEEK	DATE	TASKS
1	Sept 3 – Sept 6, 2019	<ul style="list-style-type: none"><li>- Setup development Environment</li><li>- Create Database</li></ul>
2	Sept 9 – Sept 13, 2019	<ul style="list-style-type: none"><li>- Implement core GUI elements (login/logout, landing page, navigation menu)</li><li>- Implement logging in and logging out functionality</li><li>- Test log in and log out</li></ul>
3	Sept 16- Sept 20, 2019	<ul style="list-style-type: none"><li>- Implement song maker page GUI</li><li>- Implement Favourites and Compositions page GUI</li></ul>
5	Sept 23 – Sept 27, 2019	<ul style="list-style-type: none"><li>- Finish adding records to database</li><li>- Implement the song maker Sounds/Listening functionality</li><li>- Test listening to notes</li><li>- Test listening to chords</li></ul>
4	Sept 30 – Oct 4, 2019	<ul style="list-style-type: none"><li>- Connect database functionality with Favourites and Compositions</li><li>- Begin adding records to database</li></ul>
6	Oct 7 – Oct 11, 2019	<ul style="list-style-type: none"><li>- Implement record searching functionality</li><li>- Begin composition creation implementation</li><li>- Implement admin page GUI</li><li>- Test search by each field</li><li>- Test beginning of creation implementation</li><li>- Test GUI (pictures, links, etc.)</li></ul>
7	Oct 15 – Oct 18, 2019	READING WEEK (no development)
8	Oct 21 – Oct 25, 2019	<ul style="list-style-type: none"><li>- Implement admin song maker functionality</li><li>- Finish composition creation</li><li>- Implement admin add/delete/promote user functionality</li><li>- Test admin song maker</li><li>- Test listening to that composition</li><li>- Test creating a composition</li><li>- Test admin CRUD functions</li></ul>
9	Oct 28 – Nov 1, 2019	<ul style="list-style-type: none"><li>- Implement user &amp; profile page</li><li>- Begin implementing profile editing functionality</li><li>- Record adding functionality</li><li>- Test record adding</li></ul>
10	Nov 4 – Nov 8, 2019	<ul style="list-style-type: none"><li>- Finish profile editing functionality</li><li>- Begin next step suggestion functionality</li><li>- Test profile editing</li></ul>
11	Nov 12 – Nov 15, 2019	<ul style="list-style-type: none"><li>- Finish next step functionality</li></ul>

		<ul style="list-style-type: none"> <li>- Implement saving and loading compositions</li> <li>- Test next step suggestion</li> <li>- Test Saving and loading compositions</li> </ul>
<b>12</b>	Nov 18 – Nov 22, 2019	<ul style="list-style-type: none"> <li>- Begin working on presentation</li> </ul>
<b>13</b>	Nov 25 – Nov 29, 2019	<ul style="list-style-type: none"> <li>- Final testing</li> <li>- Continue work on presentation</li> <li>- Finalize presentation</li> </ul>