Design

The purpose of this design report is to outline the overall design of the system we are producing. This will include the user interface design, the database design and the design of what users of the system will be able to do.

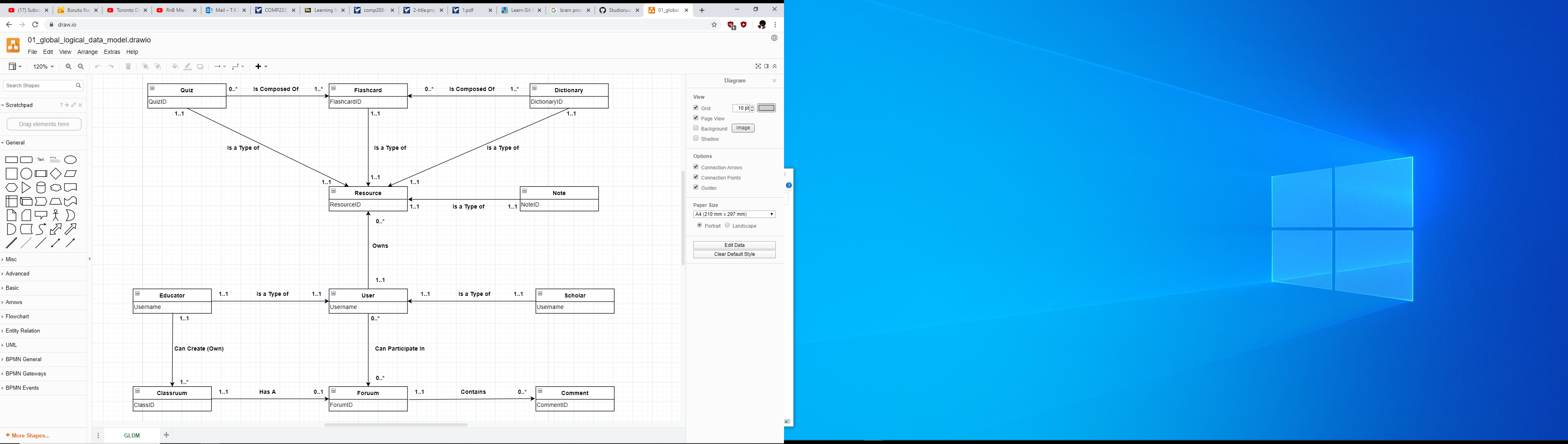
Aims of the system:

This is the design of a learning application that can help students with their studies and teachers to teach. This is done through allowing users to create resources in the form of dictionaries, flashcards and quizzes.

Resources will be shared through making them public and accessible in the public domain or through Classruum’s where every member of the Classruum will be able to access the resources shared by its educator.

The decision has been made to make the application in javafx as the group is familiar with java as a programming language. MySQL will be used for the database structure.

ER Diagram



A user is the account which will interact with the resources. Types of user are Educator and scholar which are identified by their username. The educator can create a classrum which can be joined by many scholars. A classrum is identified by its classid.

Data Dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| **Entity Name** | **Description** | **Aliases** | **Occurrence** |
| Quiz | A sorted collection of flashcards which can be from different sets of Dictionaries | Test | Zero or more Quizzes are composed by one or more Flashcards. Each Quiz is a type of resource |
| Flashcard | A resource containing two sides of text |  | Each Flashcard is a type of Resource |
| Dictionary | A collection of flashcards related to a topic | Deck | One or more Dictionaries is composed by zero or more Flashcards. Each Dictionary is a type of Resource |
| Resource | Some form of learning material | Item | A Resource can be owned by one and only one user |
| Note | A resource containing one side of text, which can be formatted according to the user |  | Each Note is a type of Resource |
| User | Someone that has access to the system | Account | One user can own multiple Resources. Zero or more Users can participate in Foruums |
| Scholar | General user who does not have class creating privileges | Student | Each and every Scholar is a type of User |
| Educator | User with the ability to create and manage classes | Teacher | Each and every Educator is a type of User. One Educator can own one or multiple Classruums |
| Classruum | A group that allows Educators to share resources with Scholars | Class | One or multiple Classruums can be owned by one Educator |
| Foruum | A public domain conversation hub which can be directly related to a specific Classruum | Forum | A single Forum can or cannot be directly related to a specific Classruum |
| Comment | An interaction posted by the User on a specific Foruum | Interaction | Zero or more Comments are contained in a particular Forum |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity** | **Multiplicity** | **Relationship** | **Multiplicity** | **Entity** |
| Quiz  Quiz | 0..\*  1..1 | IsComposedOf  IsaTypeOf | 1..\*  1..1 | Flashcard  Resource |
| Flashcard | 1..1 | IsaTypeOf | 1..1 | Resource |
| Dictionary  Dictionary | 1..\*  1..1 | IsComposedOf  IsaTypeOf | 0..\*  1..1 | Flashcard  Resource |
| Resource | None | None | None | None |
| Note | 1..1 | IsaTypeOf | 1..1 | Resource |
| User  User  User | 1..1  0..\*  1..1 | Owns  CanParticipateIn  CanPost | 0..\*  0..\*  0..\* | Resource  Foruum  Comment |
| Scholar  Scholar | 1..1  0..\* | IsaTypeOf  CanBeAMemberOf | 1..1  0..\* | User  Classruum |
| Educator  Educator | 1..1  1..1 | IsaTypeOf  CanCreate | 1..1  1..\* | User  Classruum |
| Classruum | 1..1 | HasA | 0..1 | Foruum |
| Foruum | 1..1 | Contains | 0..\* | Comment |
| Comment | None | None | None | None |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity** | **Attributes** | **Description** | **Data type and Length** | **Nulls** |
| Quiz | ResourceID  QuizName  QuizTopic | Uniquely identifies the quiz  Name of the Quiz  Topic of the Quiz | 6 variable Characters  30 variable characters  30 variable characters | No  No  Yes |
| Flashcard | ResourceID  DictionaryID  QuizID  FrontContent  BackContent | Uniquely identifies the flashcard  Identifies Deck containing flashcard  Identifies containing Quiz  Content (text, etc) on the front of the card  Content (text, etc) on the front of the card | 6 variable character  6 variable characters  6 variable charcaters  255 variable characters  255 variable characters | No  Yes  Yes  No  No |
| Dictionary | ResourceID  DictionaryName | Uniquely identifies Dictionary  Name of the Dictionary | 6 variable characters  30 variable characters | No  No |
| Resource | ResourceID  UserID  Resource\_Type  ResourceName  Privacy | Uniquely identifies Resource  Identifies user owning Resource  The type of Resource it is  The name of the Resource  The access level of the resource for non owners(public, private, shared) | 6 variable characters  6 variable charaters  10 Variable characters  30 Variable characters  7 Variable characters | No  No  No  No  no |
| Note | ResourceID  NoteTitle  NoteContent | Uniquely identifies Note  Title of the Note  Content (text, etc) of the note | 6 variable characters  30 variable characters  255 variable characters | No  No  No |
| User | Time\_Created  Username  Email  Hashed\_Password  Account\_Type  ClassID | The time the account was created  Username of User  Email of User  Password for the User account  Identifies the type of account (educator or scholar)  Identifies which class the user is a member of | TimeStamp  30 variable characters  50 variable characters  127 variable characters  8 Variable characters  5 variable characters | No  No  No  No  No  Yes |
| Scholar | ScholarID  UserID | Uniquely identifies Scholar  Uniquely identifies User | 6 variable integers  6 variable integers | No  No |
| Educator | EducatorID  UserID | Uniquely identifies Educator  Uniquely identifies User | 6 variable integers  6 variable integers | No |
| Classruum | ClassID  EducatorID  ClassName | Uniquely identifies Classruum  Identifies owning Educator  Name of the Classruum | 5 variable characters  5 variable charcaters  30 variable characters | No  No  No |
| Foruum | ForumID  ClassID  ForumTitle | Uniquely identifies Foruum  Identifies Class tied to Foruum  Title of the Foruum | 6 variable integers  6 variable integers  30 variable characters | No  Yes  No |
| Comment | CommentID  ForumID  CommentContent  UserID | Uniquely identifies Comment  Identifies Foruum containing the comment  Content (text, etc) of the Comment  Identifies the User that posted the Comment | 6 variable integers  6 variable integers  255 characters  8 variable characters | No  No  No  No |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity** | **Attributes** | **Description** | **Key** | **Nulls** |
| Quiz | ResourceID  QuizName  QuizTopic | Uniquely identifies a quiz  Name of the Quiz  Topic of the Quiz | Primary key | No  No  Yes |
| Flashcard | ResourceID  DictionaryID  QuizID  FrontContent  BackContent | Uniquely identifies flashcard  Uniquely identifies containing Deck  Uniquely identifies containing Quiz  Content (text, etc) on the front of the card  Content (text, etc) on the front of the card | Primary key | No  No  No  No  No  No |
| Dictionary | ResourceID  DictionaryName | Uniquely identifies Dictionary  Name of the Dictionary | Primary key | No  No  No |
| Resource | ResourceID  UserID  Resource\_Type  Privacy | Uniquely identifies Resource  Identifies user owning Resource  The type of resource it is (quiz, note etc.)  The access level of the resource (public, private or shared) | Primary key | No  No |
| Note | ResourceID  NoteTitle  NoteContent | Uniquely identifies Note  Title of the Note  Content (text, etc) of the note | Primary key | No  No  No  No |
| User | Username  Email  Password  ClassID  Time\_created | Uniquely identifies User  Email of User  Hashed Password for the User account  The class the user belongs to  The time the user account was made | Primary key  Alternate key | No  No  No  Yes  No |
| Scholar | ScholarID  UserID | Uniquely identifies Scholar  Uniquely identifies User | Primary key | No |
| Educator | EducatorID  UserID | Uniquely identifies Educator  Uniquely identifies User | Primary key | No |
| Classruum | ClassID  EducatorID  ClassName | Uniquely identifies Classruum  Identifies owning Educator  Name of the Classruum | Primary key | No  No  No |
| Foruum | ForumID  ClassID  ForumTitle | Uniquely identifies Foruum  Identifies Class tied to Foruum  Title of the Foruum | Primary key | No  Yes  No |
| Comment | CommentID  ForumID  CommentContent  UserID | Uniquely identifies Comment  Identifies containing Foruum  Content (text, etc) of the Comment  Identifies User which posted Comment | Primary key | No  No  No  No |

**Logical tables**

|  |  |
| --- | --- |
| **User**(Account\_Type, Email, Username, Hashed\_Password, ClassID, Created)  **Primary Key** Username  **Foreign Key** ClassID *references* **Classruum**(ClassID)  **Alternate Key** Email | **Foruum**(ForumID, Creator, Forum\_Title, Closed, Created)  **Primary Key** ForumID  **Foreign Key** Creator *references* **User**(Username) |
| **Resources**(Resource\_type, Resource\_ID, Creator, Privacy)  **Primary Key** ResourceCode  **Foreign Key** Creator *references* **User**(Username) | **Comment**(CommentID, ForumID, Creator, Comment\_Content, Created)  **Primary Key** CommentID  **Foreign Key** ForumID *references* **Foruum**(ForumID)  **Foreign Key** Creator *references* **User**(Username) |
| **Classruum**(ClassID, EducatorID, Class\_Name)  **Primary Key** ClassID  **Foreign Key** EducatorID *references* **User**(Username) | **Notes**(ResourceID, NoteTitle, NoteContent)  **Primary Key** ResourceID  **Foreign Key** ResourceID *references* **Resource**(ResourceID) |
| **FlashCard**(ResourceID, FrontContent, BackContent, QuizID, DictionaryID)  **Primary Key** ResourceID  **Foreign Key** ResourceID *references* **Resource**(ResourceID) | **Quiz**(ResourceID, QuizName, QuizTopic)  **Primary Key** ResourceID  **Foreign Key** ResourceID *references* **Resource**(ResourceID) |
| **Dictionary**(ResourceID, DictionaryName)  **Primary Key** ResourceID  **Foreign Key** ResourceID *references* **Resource**(ResourceID) |  |

The Scholar and Educator tables were not required as any extra details could be held within the User table with the account type attribute.

Foreign Keys are used as primary keys in the tables for each resource as the relationship between them and the resource table is 1 to 1 and can be uniquely identified with a ResourceID. E.g. Q207 for a quiz resource or F492 for a flashcard resource.

The Foruum is a forum that can be linked to a specific Classruum but if not it is then a public forum open for anyone to leave comments on. Foruums with a null value for ClassID will be a public forum.

**Physical tables**

**User Table**

Domain Account\_Type Variable length string maximum length 8

Domain Email\_Adress Variable length character string maximum length 50

Domain Username Variable length character string maximum length 30

Domain Password Variable length character string maximum length 50

Domain Clasruum Variable length character string maximum length 5

Time\_Created TIMESTAMP

User( Account\_Type Account\_Type NOT NULL

Email Email\_Address NOT NULL

Username Username NOT NULL

Hashed\_Password Password NOT NULL

ClassID Classruum NULL

Created Time\_Created NOT NULL

Primary Key Username

Alternate Key Email

Foreign Key ClassID references Class(ClassID)

**Resources Table**

Domain Resource\_Type Variable length string maximum length 10

Domain Resource\_Code Variable length character string maximum length 6 //like Q1234 for a quiz

Domain Resource\_Name Variable length character string maximum length 30

Domain Owner Variable length character string maximum length 30

Domain Privacy Variable length character string max size 7 if public/private/shared

Resources(Type Resource\_Type NOT NULL

ID Resource\_ID NOT NULL

Name Resource\_Name NOT NULL

Creator Owner NOT NULL

Privacy Privacy NOT NULL

Primary Key Code

Foreign Key Creator references User(Username)

**Classruum Table**

Domain ClassID Variable length string maximum length 6 //C208

Domain ClassName Variable length character string maximum length 25 //Mr Carrol’s Class

Domain Owner Variable length character string maximum length 8

Classruum(ClassID ClassID NOT NULL

Class\_Name Name NOT NULL

EducatorID Owner NOT NULL

Primary Key ClassID

Foreign Key EducatorID references User(Username)

**Foruum Table**

Domain ForumID Integer

Domain Forum\_Title Variable length character string maximum length 25

Domain Closed Binary

Domain Owner Variable length character string maximum length 30

Domain Time\_Created TimeStamp

Forum(ForumID Resource\_Type NOT NULL

Closed Closed NOT NULL

Creator Owner NOT NULL

Created Time\_Created NOT NULL

Forum\_Title Forum\_Title NOT NULL

Primary Key ForumID

Foreign Key Creator references User(Username)

**Comment Table**

Domain CommentID Integer

Domain ForumID Integer

Domain Comment\_Content Variable length character string maximum length 300

Domain Owner Variable length character string maximum length 30

Domain Time\_Created TimeStamp

|  |  |  |
| --- | --- | --- |
| Comment( | CommentID | CommentID NOT NULL |
| ForumID | ForumID NOT NULL |
| Content | Comment\_Content NOT NULL |
| Creator | Owner NOT NULL |
| Created | Time\_Created NOT NULL |
| Primary Key CommentID | |
| Foreign Key Creator references User(Username) | |
| Foreign Key ForumID references Forum(ForumID) | |

**Notes Table**

Notes(ResourceID, NoteTitle, NoteContent)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

Domain ResourceID fixed length character string maximum length 5

Domain FrontContent variable length character string maximum length 255

Domain NoteTitle variable length character string maximum length 30

Notes(ResorceID              ResourceID         NOT NULL

            NoteContent       NoteContent    NOT NULL

NoteTitle NoteTitle NOT NULL

)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

**FlashCards Table**

FlashCards(ResourceID, FrontContent, BackContent, QuizID, DictionaryID)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

Domain ResourceID fixed length character string maximum length 5

Domain FrontContent variable length character string maximum length 255

Domain BackContent variable length character string maximum length 255

Domain QuizID variable length character string maximum length 5

Domain DictionaryID variable length character string maximum length 5

FlashCard(ResourceID      ResourceID         NOT NULL

FrontContent       FrontContent    NOT NULL

BackContent        BackContent      NOT NULL

QuizID QuizID NULL

DictionaryID DictionaryID NULL

)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

Foreign Key QuizID references Quiz(ResourceID)

Foreign Key DictionaryID references Dictionary(ResourceID)

**Quiz Table**

Quiz(ResourceID, QuizName, QuizTopic)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

Quiz(ResourceID              ResourceID         NOT NULL

            Question                FrontContent    NOT NULL

             Answer                  BackContent      NOT NULL

)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

**Dictionary Table**

Dictionary(ResourceID, DictionaryName)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

Dictionary(ResourceID     ResourceID         NOT NULL

            Name              DictionaryName NOT NULL

)

Primary Key ResourceID

Foreign Key ResourceID references Resource(ResourceID)

These tables will be created in MySQL

Transaction Table

I = input   
R= read

U=update

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Transaction /  Table | Create new member | | | | Make Classruum | | | | Make Foruum | | | | Make quiz | | | | | Comment | | | | Make note | | | | Join Classruum | | | | Search for quiz/foruum | | | | |
|  | I | R | U | D | I | R | U | D | I | R | U | D | | I | R | U | D | I | R | U | D | I | R | U | D | I | R | U | D | I | R | U | D |
| Educator | x |  |  |  | x |  |  |  | x |  |  |  | | x |  |  |  |  |  | x | x |  |  |  |  |  |  |  |  |  |  |  |  |
| Scholar | x |  |  |  |  |  |  |  | x |  |  |  | | x |  |  |  |  |  | x | x |  |  |  |  | x |  |  |  |  |  |  |  |
| Classruum |  |  |  |  |  |  | x |  |  |  |  |  | |  |  |  |  |  |  | x |  |  |  |  |  |  | x | x |  |  |  |  |  |
| Foruum |  |  |  |  |  |  |  |  |  |  | x |  | |  |  |  |  |  |  | x |  |  |  |  |  |  |  |  |  |  | x |  |  |
| Quiz |  |  |  |  |  |  |  |  |  |  |  |  | |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |
| Notes |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  | x | x |  |  |  |  |  |  |  |  |

D=delete

1.Enter details of new member

2. Make classruum

3. Create foruum

4. Create quiz

5. Comment

6. Create note

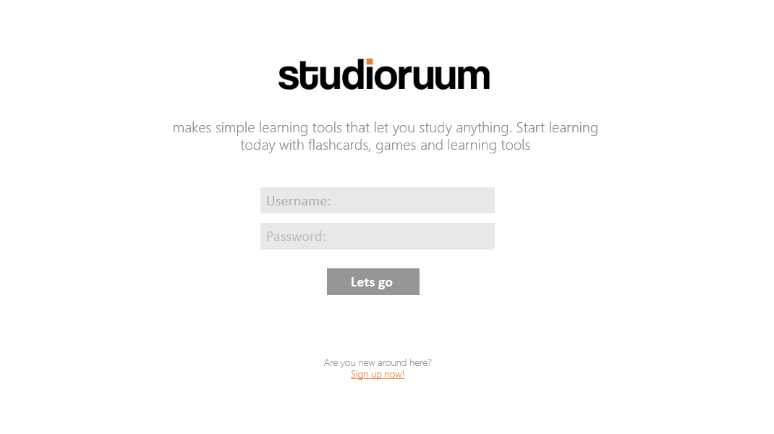
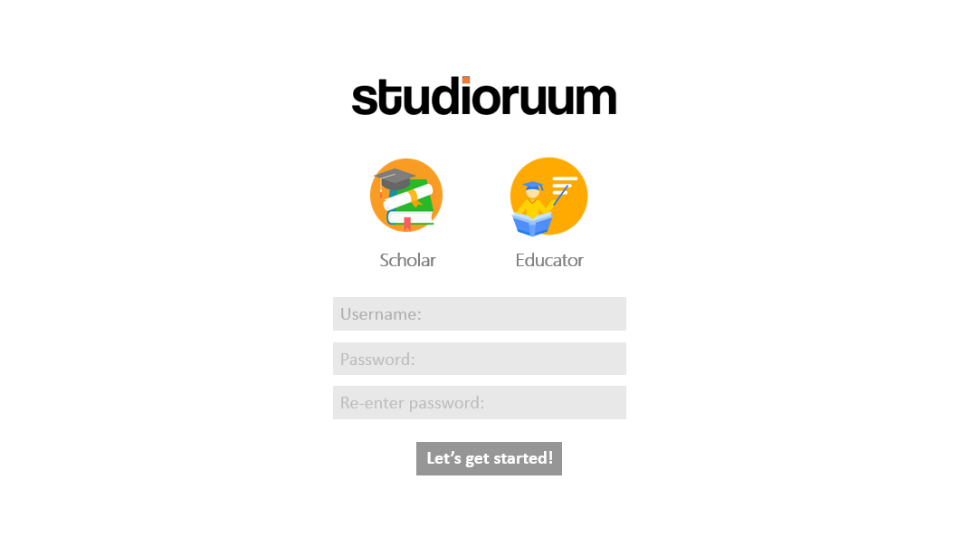
7. Join classruum

8. Search for quiz/foruum

9. create flashcard

10. create dictionary

**Interface Design and Explanation**

In the initial design for our interface, we had to consider the form and functionality of our program. We have chosen to implement a more professional approach (whilst maintaining our accessibility) compared to the likes of competitor applications (for example Quizlet). This is denoted through our simplistic and minimalistic colour pallet (pastel) and ease of access. to We ensured to fulfil the objectives specified in the requirements whilst maintaining the theme and visual representation of our product. Our target demographic are students (age 15-25) and teachers.

User can choose their preferred account type: Scholar or Educator

Button that will take them to home page, if their account credentials are correct. Chose to used colloquial verbiage to connote accessibility, and make the program appear more user friendly.

If user is new, they can create a new account, which will lead them to the next page: create account.

Greet the user with the logo and a short sentence that explains what our program does.

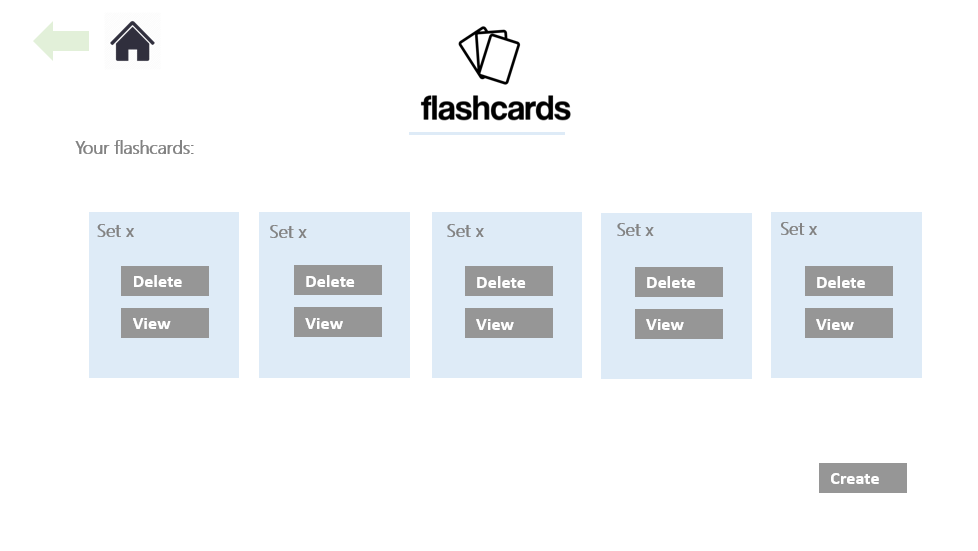
**Page: 1**

**Page: 2**

Button that will take them to home page, and add the users account to the database saving there username/email, password and account type.



**Page: 3**



Back button used to navigate to previous page. (Can be used if the user makes a mistake)

**Page: 4**

View will take to view flash card page. (page **5**.)

Home button takes to home page

This shows the users flash card sets, and allows the user to view or delete them

This shows the users flash card sets, and allows the user to view or delete them

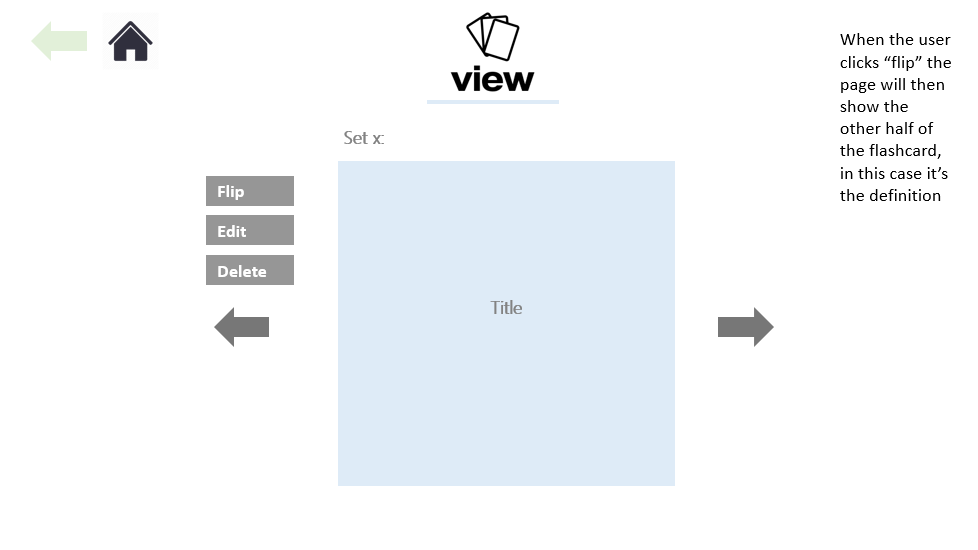
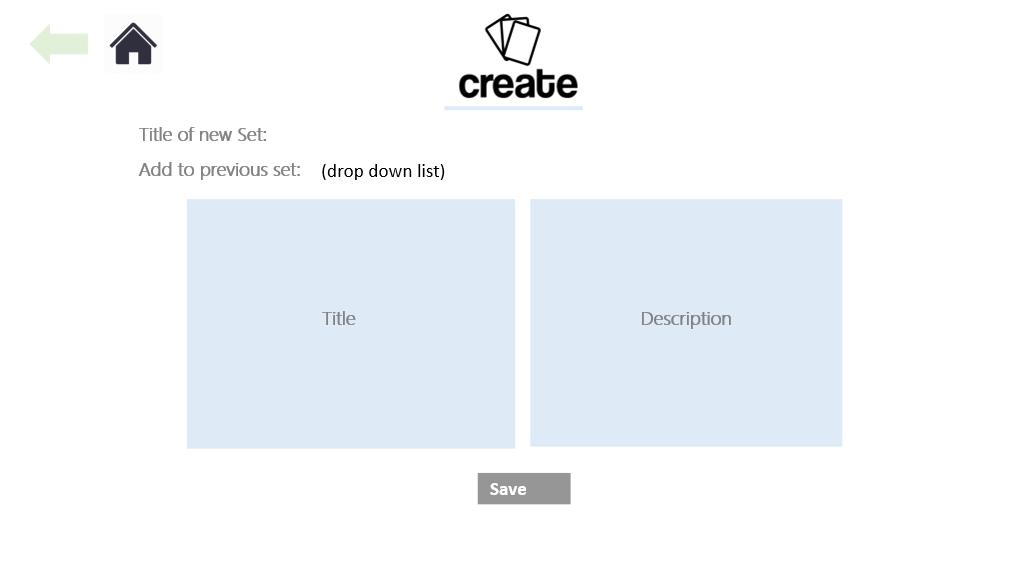
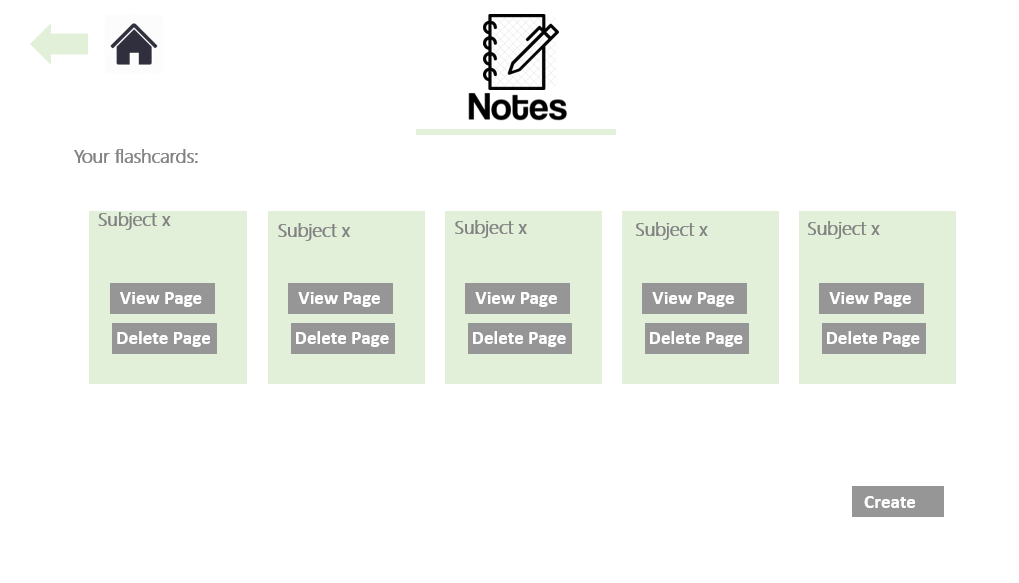
This indicates the page the user is on.

This will take them to the view dictionaries where they can save and delete sets of dictionaries

This will take them to the view notes where they can save and delete sets of notes

This will take them to the view flashcards where they can save and delete sets of flashcards

Short quote that used to inspire the user.



Will take you to view notes page **(page 8)**

Will take you to create notes page

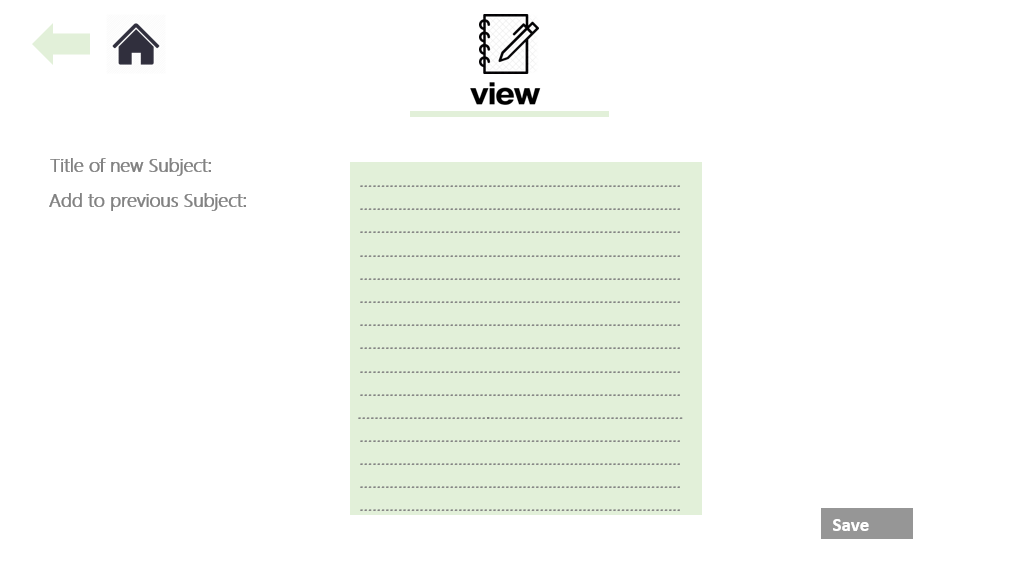
**Page: 5**

**Page: 7**

**Page: 6**

Save button will save combination into database.

Edit button lets you change text in the card

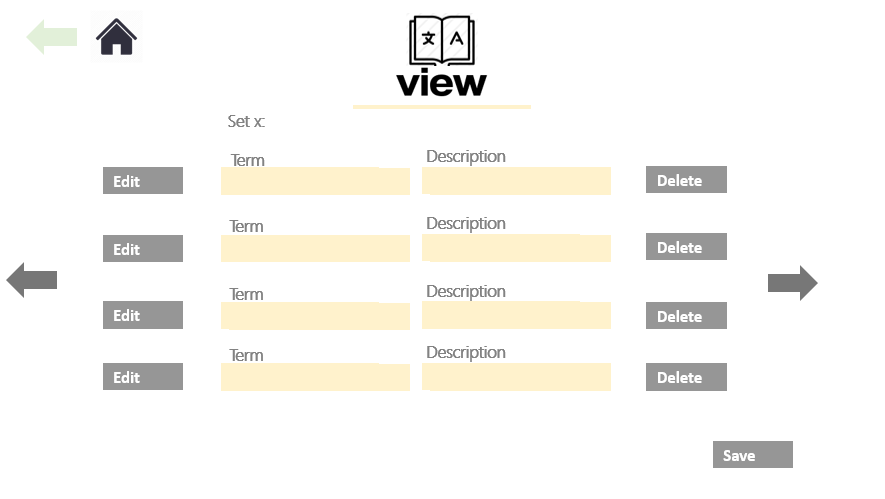


**Page: 9**

Button saves notes to the database and into the subject (new or previous)

Choose whether to name a new set or save note in another subject

**Page: 8**



This will delete the attributes in the database.

This will delete the attributes in the database.

# Signatures

In the Order - Lloyd Jones, Daniel Ponturo, Tyler Bunsie, Bobby-Chase Davies, Lachlan Smith, Jordan Clewlow.

