

## Criteria B – Design

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## B2 – Database Design

### B2.1 – ‘users’ table

#	Name	Type	Collation	Null	Attributes	Comments	Extra
1	id	int(11)		No	UNSIGNED	System Generated Serial	AUTO_INCREMENT
2	avatar	varchar(100)	utf8mb4_general_ci	Yes		Avatar of user's Google Account	
3	username	varchar(30)	utf8mb4_general_ci	Yes		Username	
4	first_name	varchar(30)	utf8mb4_general_ci	Yes		First Name	
5	last_name	varchar(30)	utf8mb4_general_ci	Yes		Last Name	
6	classID_1	int(11)		Yes	UNSIGNED	#1 Class ID of user	
7	classID_2	int(11)		Yes	UNSIGNED	#2 Class ID of user	
8	classID_3	int(11)		Yes	UNSIGNED	#3 Class ID of user	
9	classID_4	int(11)		Yes	UNSIGNED	#4 Class ID of user	
10	classID_5	int(11)		Yes	UNSIGNED	#5 Class ID of user	
11	classID_6	int(11)		Yes	UNSIGNED	#6 Class ID of user	
12	created_at	datetime		No		Time at which record is created	
13	updated_at	datetime		Yes		Time at which record is updated	

### B2.2 – ‘classes’ table

#	Name	Type	Collation	Null	Attributes	Comments	Extra
1	classID	int(11)		No	UNSIGNED	System Generated Serial	AUTO_INCREMENT
2	teacherID	int(11)		No	UNSIGNED	userID of teacher of the class	
3	form	int(1)		No	UNSIGNED	Form	
4	className	varchar(30)	utf8mb4_general_ci	No		Name of the class	
5	created_at	datetime		No		Time at which record is created	
6	updated_at	datetime		Yes		Time at which record is updated	

### B2.3 – ‘assignments’ table

#	Name	Type	Collation	Null	Attributes	Comments	Extra
1	assignmentID	int(64)		No	UNSIGNED	System Generated Serial	AUTO_INCREMENT
2	classID	int(11)		No	UNSIGNED	classID of the class which the assignment is assigned	
3	userID	int(11)		No	UNSIGNED	userID of the user who own the assignment	
4	assignmentName	varchar(64)	utf8mb4_general_ci	Yes		Name of the assignment	
5	topic	varchar(64)	utf8mb4_general_ci	No		Topic of the assignment	
6	dueDate	date		Yes		Due date of the assignment	
7	totalMark	int(4)		Yes	UNSIGNED	Total mark awarded in the assignment	
8	maxMark	int(4)		Yes	UNSIGNED	Maximum mark of the assignment	
9	studentProgress	int(3)		No	UNSIGNED	Percentage of the questions in the assignment being done	
10	teacherProgress	int(3)		No	UNSIGNED	Percentage of the questions in the assignment being marked	
11	created_at	datetime		No		Time at which record is created	
12	updated_at	datetime		Yes		Time at which record is updated	

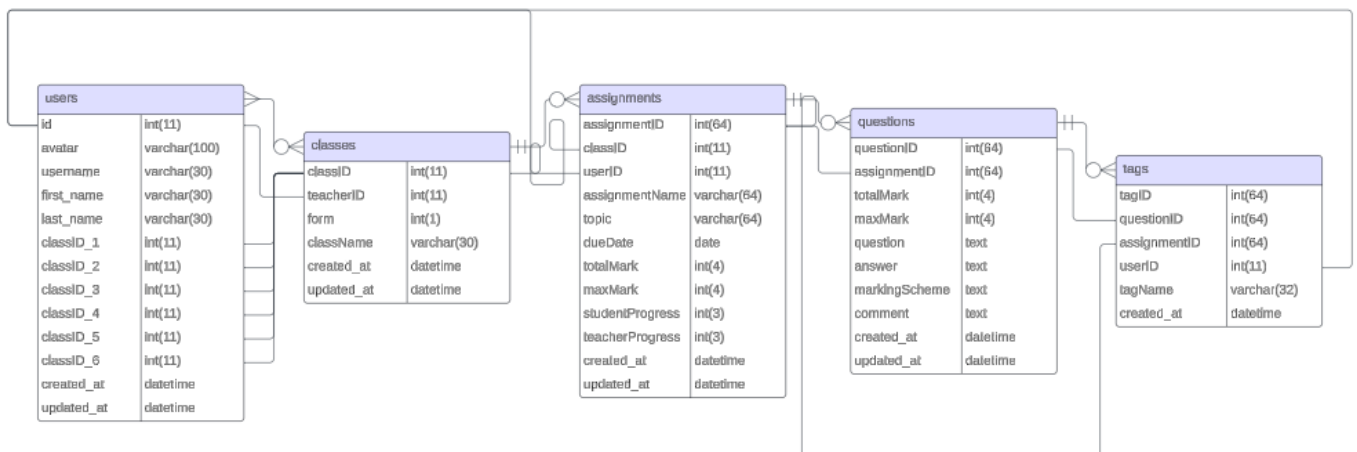
## B2.4 – ‘questions’ table

#	Name	Type	Collation	Null	Attributes	Comments	Extra
1	questionID	int(64)		No	UNSIGNED	System Generated Serial	AUTO_INCREMENT
2	assignmentID	int(64)		No	UNSIGNED	assignmentID of the assignment which the question belongs to	
3	totalMark	int(4)		Yes	UNSIGNED	Total mark awarded in the question	
4	maxMark	int(4)		Yes	UNSIGNED	Maximum mark of the question	
5	question	text	utf8mb4_general_ci	No		Question	
6	answer	text	utf8mb4_general_ci	No		Student's answer	
7	markingScheme	text	utf8mb4_general_ci	No		Marking scheme of the question	
8	comment	text	utf8mb4_general_ci	No		Teachers' comment on student's answer	
9	created_at	datetime		No		Time at which record is created	
10	updated_at	datetime		Yes		Time at which record is updated	

## B2.5 – ‘tags’ table

#	Name	Type	Collation	Null	Attributes	Comments	Extra
1	tagID	int(64)		No	UNSIGNED	System Generated Serial	AUTO_INCREMENT
2	questionID	int(64)		No	UNSIGNED	questionID of the question which the tag belongs to	
3	assignmentID	int(64)		No	UNSIGNED	assignmentID of the assignment which the tag belongs to	
4	userID	int(11)		No	UNSIGNED	userID of the user who created the tag	
5	tagName	varchar(32)	utf8mb4_general_ci	No		Name of the tag	
6	created_at	datetime		No		Time at which record is created	

## B2.6 – Entity Relationship Diagram (ERD) of database



## B3 - Screen Layouts

### B3.1 – Login Page

Login Page

The image shows a hand-drawn login page layout within a rectangular frame. At the top center is the word "Login" in a large, handwritten font. Below it are two input fields. The first is labeled "Username" and contains the text "Type your username" and "Invalid Username" in red. The second is labeled "Password" and contains the text "Type your password" and "Invalid password" in red. To the right of the password field is a link that says "Forgot password?". Below the input fields is a large rectangular button labeled "LOGIN". Underneath the button is the text "or Sign Up Using". At the bottom is a button with a Google "G" logo and the text "Sign in with Google". Two blue lines with arrows point from the text "Display when invalid Username / password" to the red error messages in the input fields.

Display when invalid Username / password

Username

Type your username

Invalid Username

Password

Type your password

Invalid password

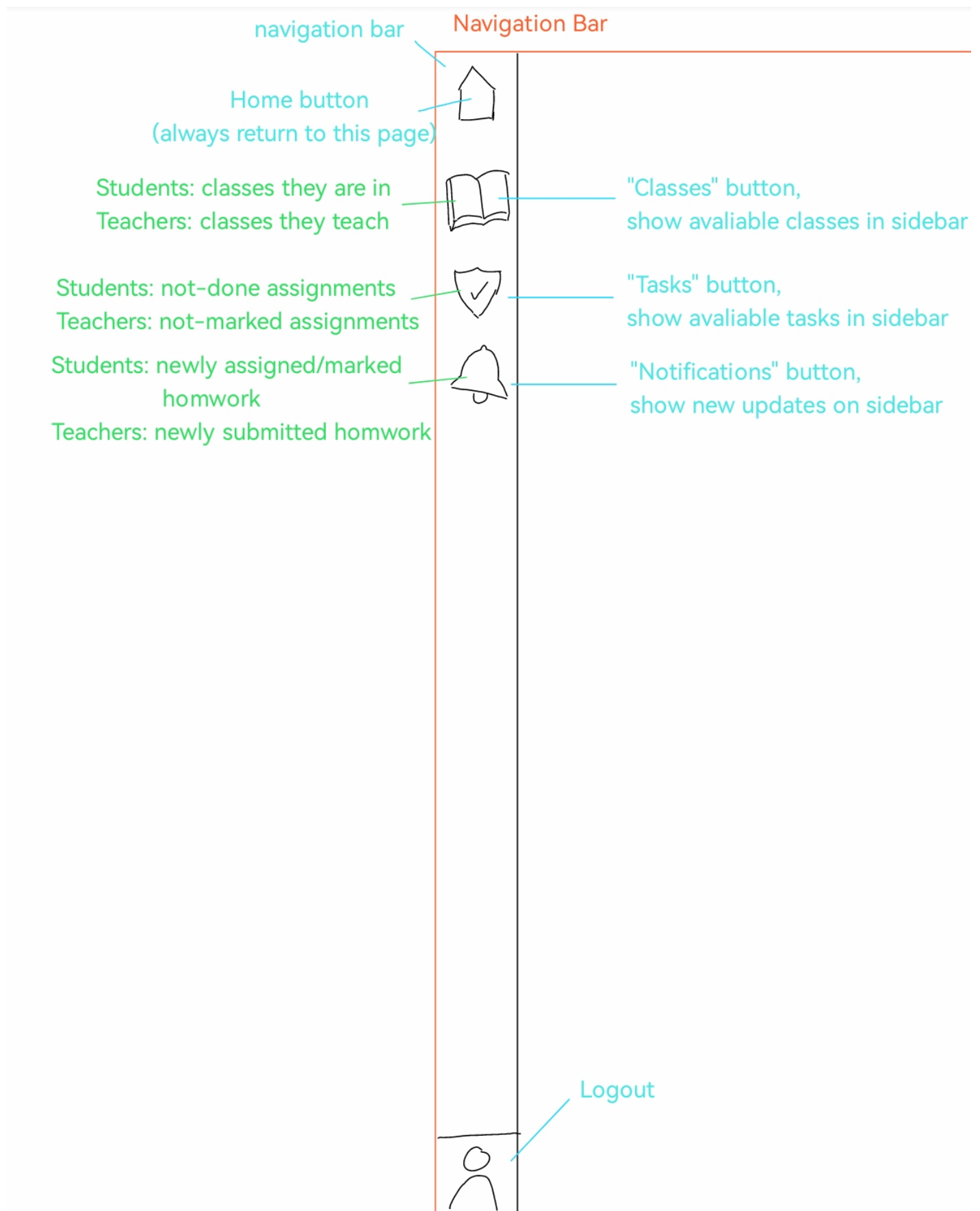
Forgot password?

LOGIN

or Sign Up Using

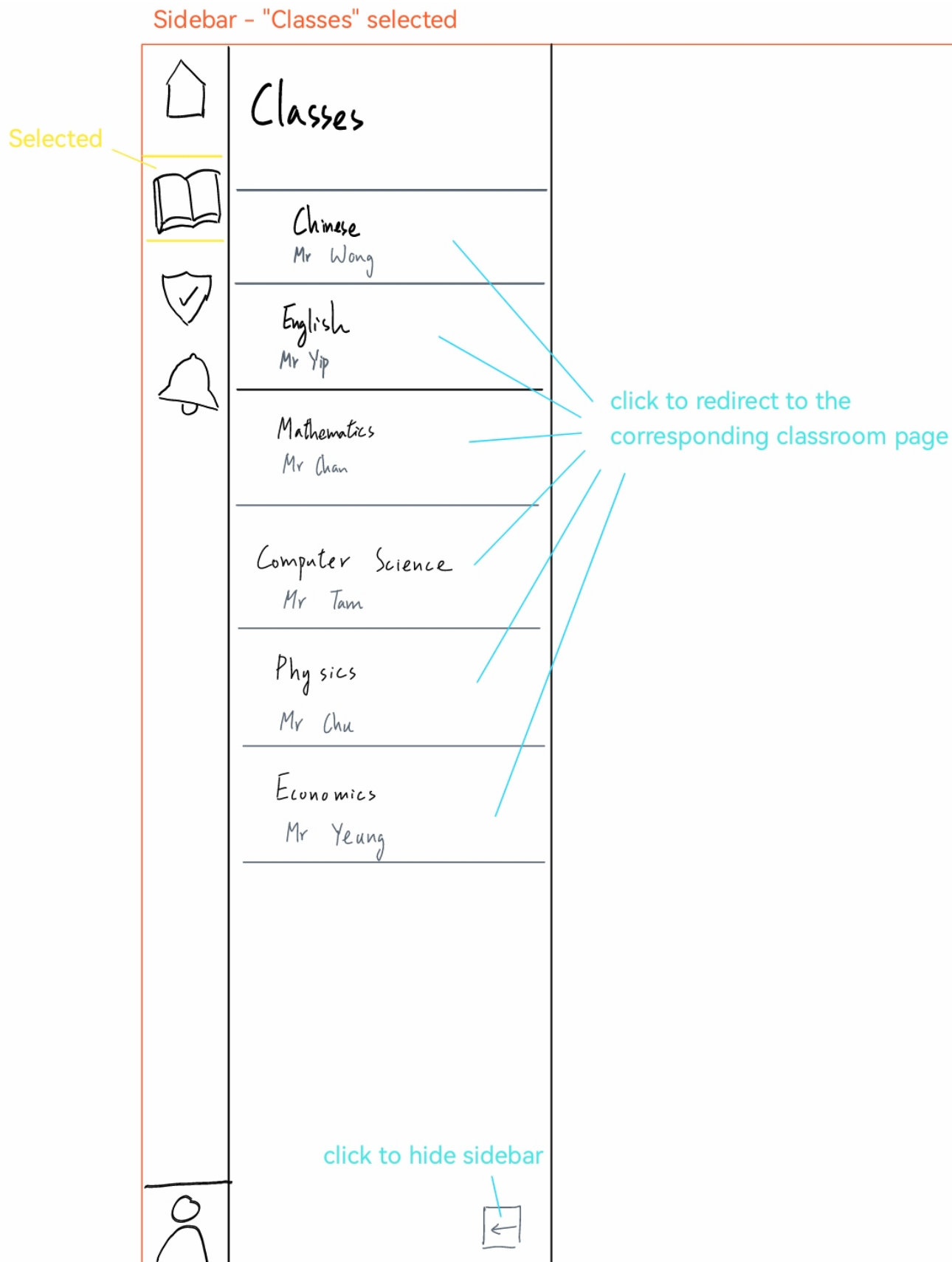
Sign in with Google

### B3.2 – Navigation Bar



## B3.3 – Sidebar

### 3.3.1 Sidebar – “Classes” selected





### 3.3.2 Sidebar – “Tasks” selected

Sidebar - "Tasks" selected

Tasks (sort by due date)


Assignment 1	2023/1/26	Chinese - Topic 1.2
Assignment 3	2023/1/27	Mathematics - Topic 3A
Class Work 2A	2023/1/31	English - Topic A


due date


Subject and corresponding Topic


3.3.3 Sidebar – “Notifications” selected


Sidebar - "Notifiactions" selected












Notifications

(sort by date)

New Assignment2023/1/26Chinese - Topic 1.2

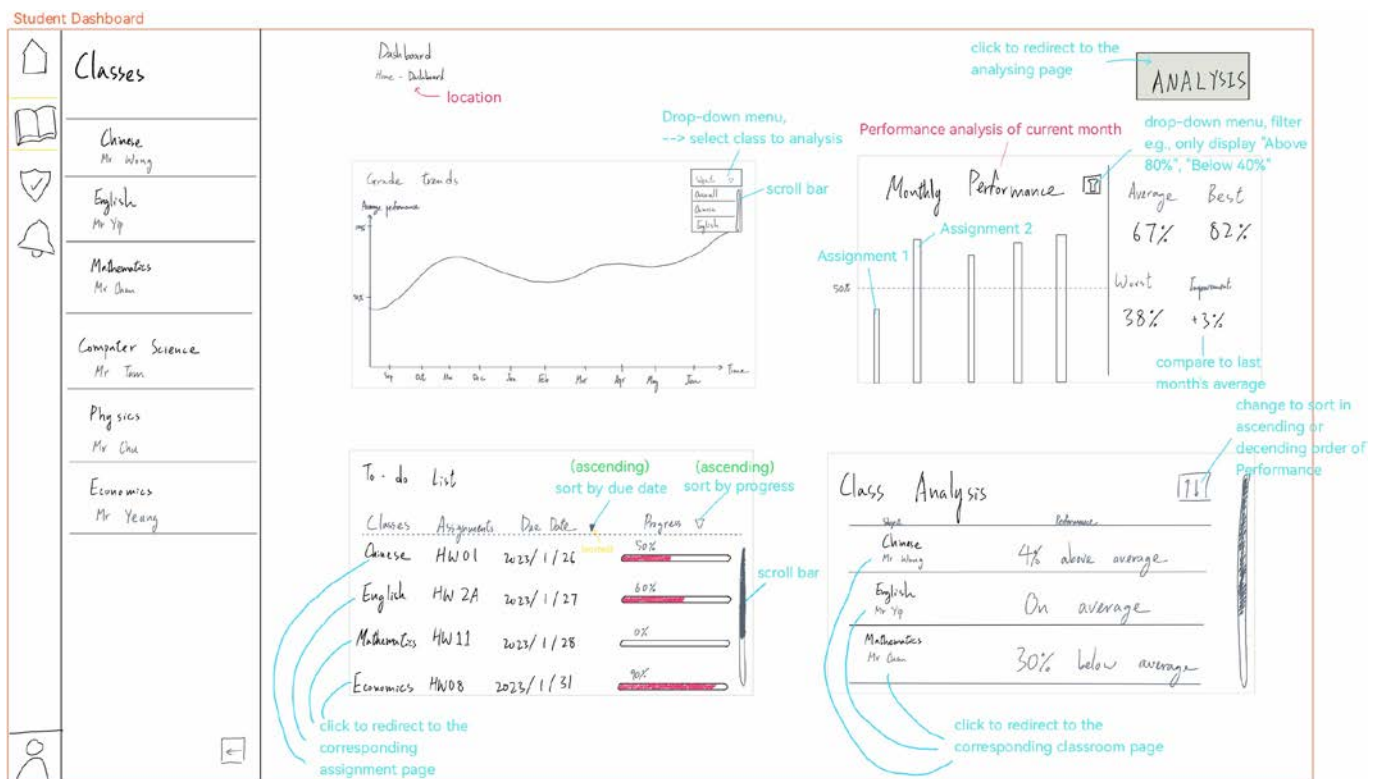
Marked Assignment2023/1/27Mathematics - Topic 3A

New Assignment2023/1/31English - Topic A

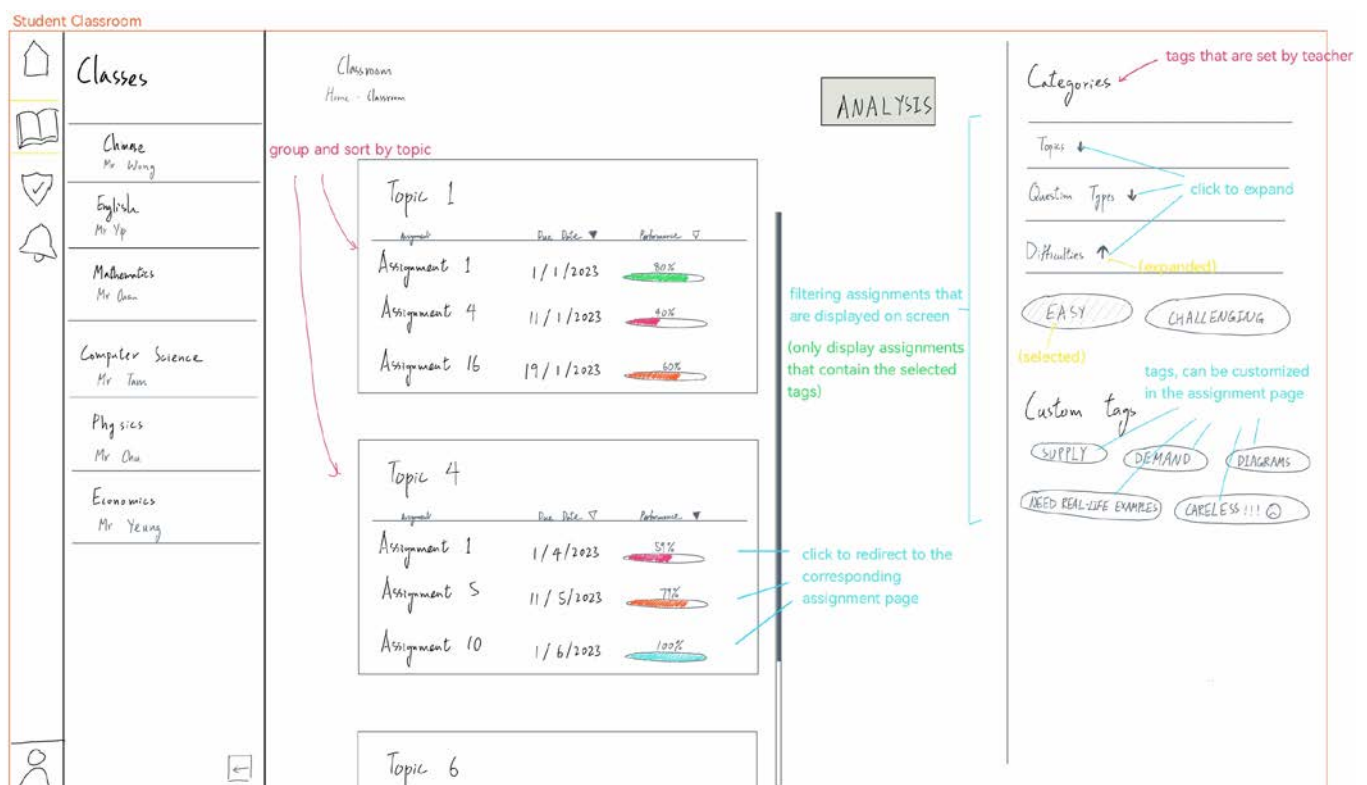


## B3.4 – Student

### 3.4.1 – Student\_Dashboard



### 3.4.2 – Student\_Classroom



### 3.4.3 – Student\_Assignment

#### Student Assignment

**Classes**

- Chinese Mr. Wong
- English Mr. Yip
- Mathematics Mr. Chan
- Computer Science Mr. Tam
- Physics Mr. Chu
- Economics Mr. Yeung

Assignment  
Home - Classroom - Assignment

**Question 1** 1/5 SIMPLE EXPLAIN + add new custom tags

In a school, there are a total of 5760 boys and girls ...  
How many ... ? Please explain your answer.

**text box**

**answer**

(marking scheme)

(teacher comments)

**Question 2** 1/6 SIMPLE DEFINITION +

In a school, there are a total of 5760 boys and girls ...  
How many ... ? Please answer with the definition of ...

**filtering questions that are displayed on screen**  
(only display questions that contain the selected tags)

**click to submit**

**SUBMIT**

**Categories**

Topics ↓

Question Types ↓

Difficulties ↑

**EASY** **CHALLENGING**

**Custom tags**

**SUPPLY** **DEMAND** **DIAGRAMS**

**NEED REAL-LIFE EXAMPLES** **CARELESS!!!**

### 3.4.4 – Student\_Analysis

#### Student Analysis

**Classes**

- Chinese Mr. Wong
- English Mr. Yip
- Mathematics Mr. Chan
- Computer Science Mr. Tam
- Physics Mr. Chu
- Economics Mr. Yeung

**Analysis**  
Home - Analysis (scatter chart)

**performance**

**assignments**

**select what assignments/questions to be analyzed**

**(line chart)**

**average performance**

**performance**

**time**

**Classes**

☐ Select All

☒ Chinese

☐ English

☐ Mathematics

☐ Computer Science

☐ Physics

☐ Economics

**Categories**

Topics ↓

Question Types ↓

Difficulties ↑

**EASY** **CHALLENGING**

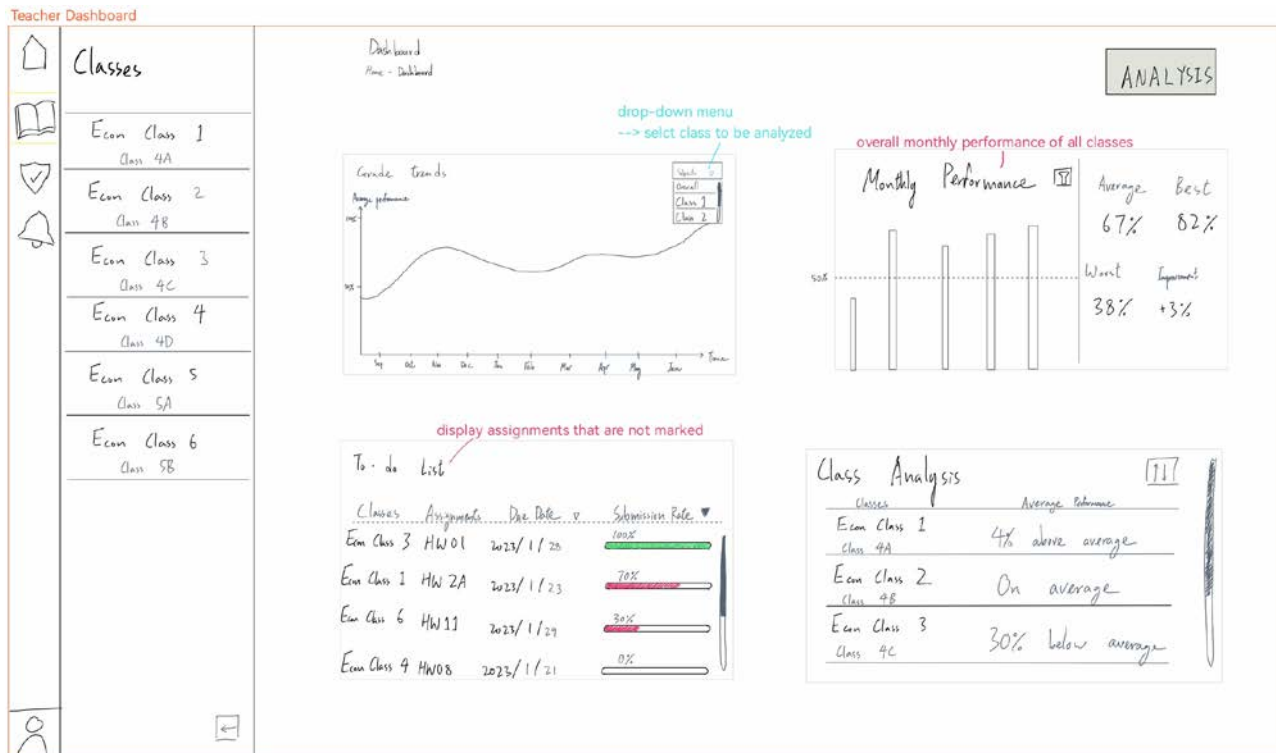
**Custom tags**

**SUPPLY** **DEMAND** **DIAGRAMS**

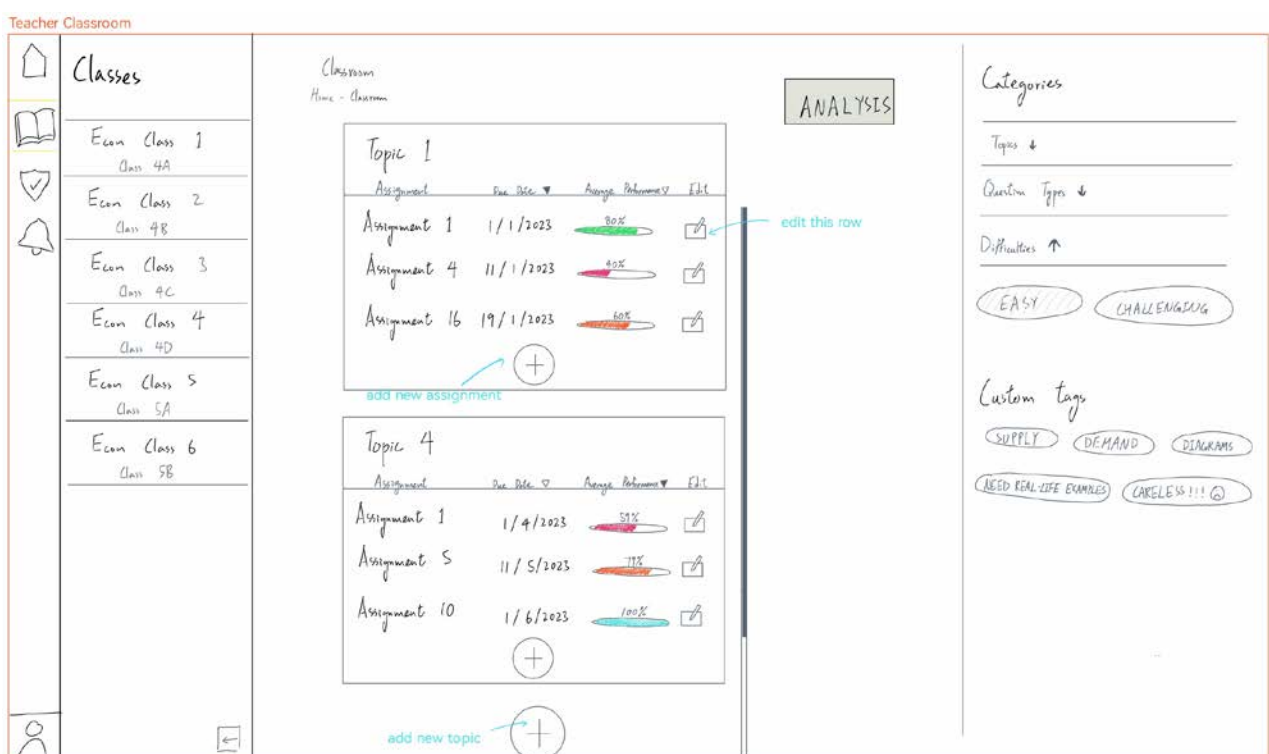
**NEED REAL-LIFE EXAMPLES** **CARELESS!!!**

## B3.5 – Teacher

### 3.5.1 – Teacher\_Dashboard



### 3.5.2 – Teacher\_Classroom



### 3.5.3 – Teacher\_Assignment

#### Teacher Assignment

**Classes**

- Econ Class 1  
Class 4A
- Econ Class 2  
Class 4B
- Econ Class 3  
Class 4C
- Econ Class 4  
Class 4D
- Econ Class 5  
Class 5A
- Econ Class 6  
Class 5B

Assignment  
Home - Classroom - Assignment

text box, to enter mark awarded

Question 1 1/5 SIMPLE EXPLAIN +

In a school, there are a total of 5760 boys and girls ...  
How many ... ? Please explain your answer

(student's work)

(marking scheme)

(teacher comments) textbox

+  
add new question

**ANALYSIS**

Status	Students	Mark
marked	4A01	1/5
marked	4A02	1/5
marked	4A03	1/5
not marked	4A04	1/5
not marked	4A05	1/5
not marked	4A06	1/5
not handed in	4A07	1/5
not handed in	4A08	1/5

go to previous/next student's work

RETURN

**Categories**

Topics ↓

Question Types ↓

Difficulties ↑

EASY CHALLENGING

**Custom tags**

SUPPLY DEMAND DIAGRAMS

NEED REAL-LIFE EXAMPLES CARELESS !!!

### 3.5.4 – Teacher\_Analysis

#### Teacher Analysis

**Classes**

- Econ Class 1  
Class 4A
- Econ Class 2  
Class 4B
- Econ Class 3  
Class 4C
- Econ Class 4  
Class 4D
- Econ Class 5  
Class 5A
- Econ Class 6  
Class 5B

Analysis  
Home - Analysis  
(scatter chart)

students, group by classes in different colours

(area chart)

**Classes**

- ☐ Select All
- ☒ Econ Class 1
- ☒ Econ Class 2
- ☐ Econ Class 3
- ☐ Econ Class 4
- ☐ Econ Class 5
- ☐ Econ Class 6

**Categories**

Topics ↓

Question Types ↓

Difficulties ↑

EASY CHALLENGING

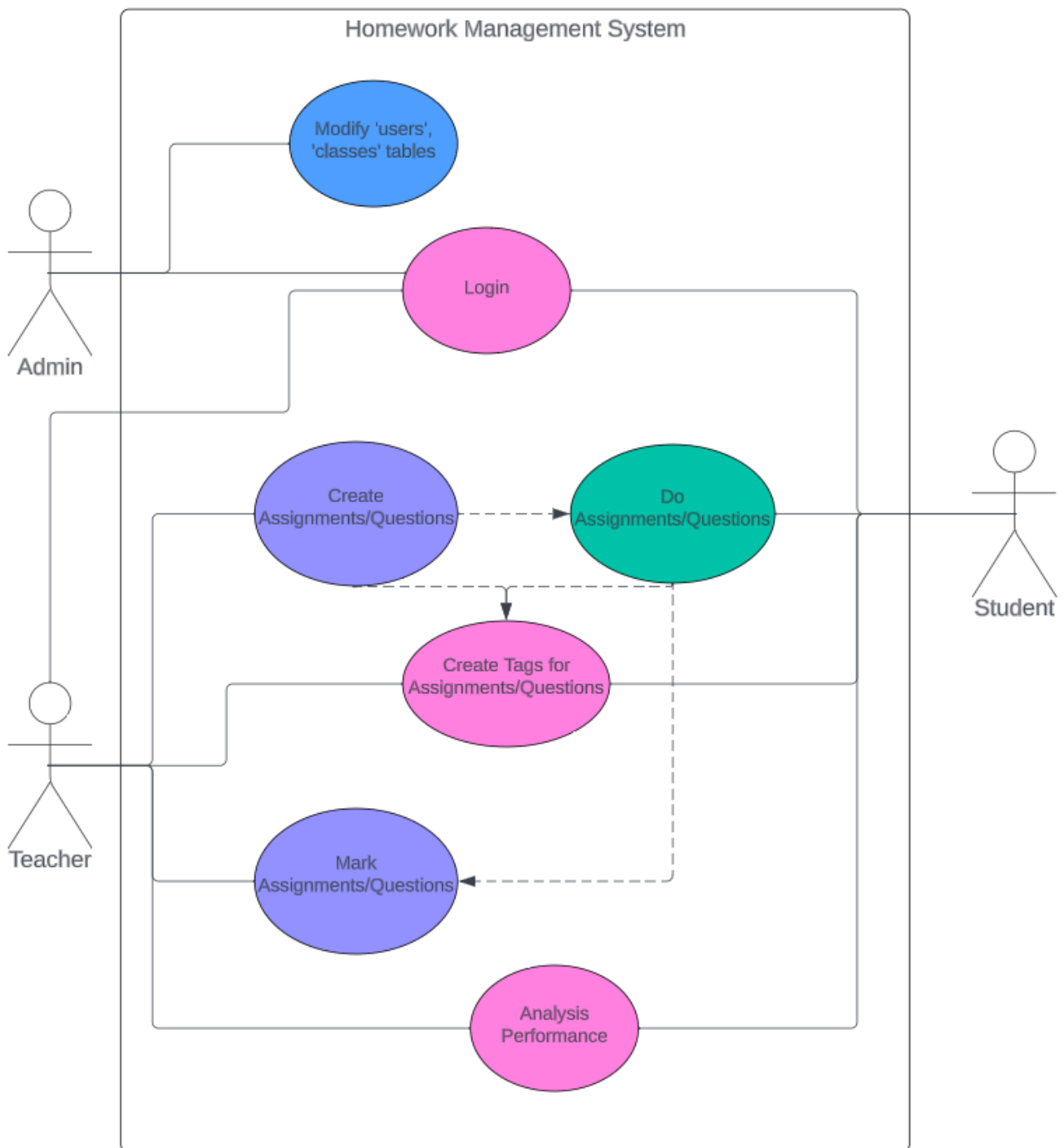
**Custom tags**

SUPPLY DEMAND DIAGRAMS

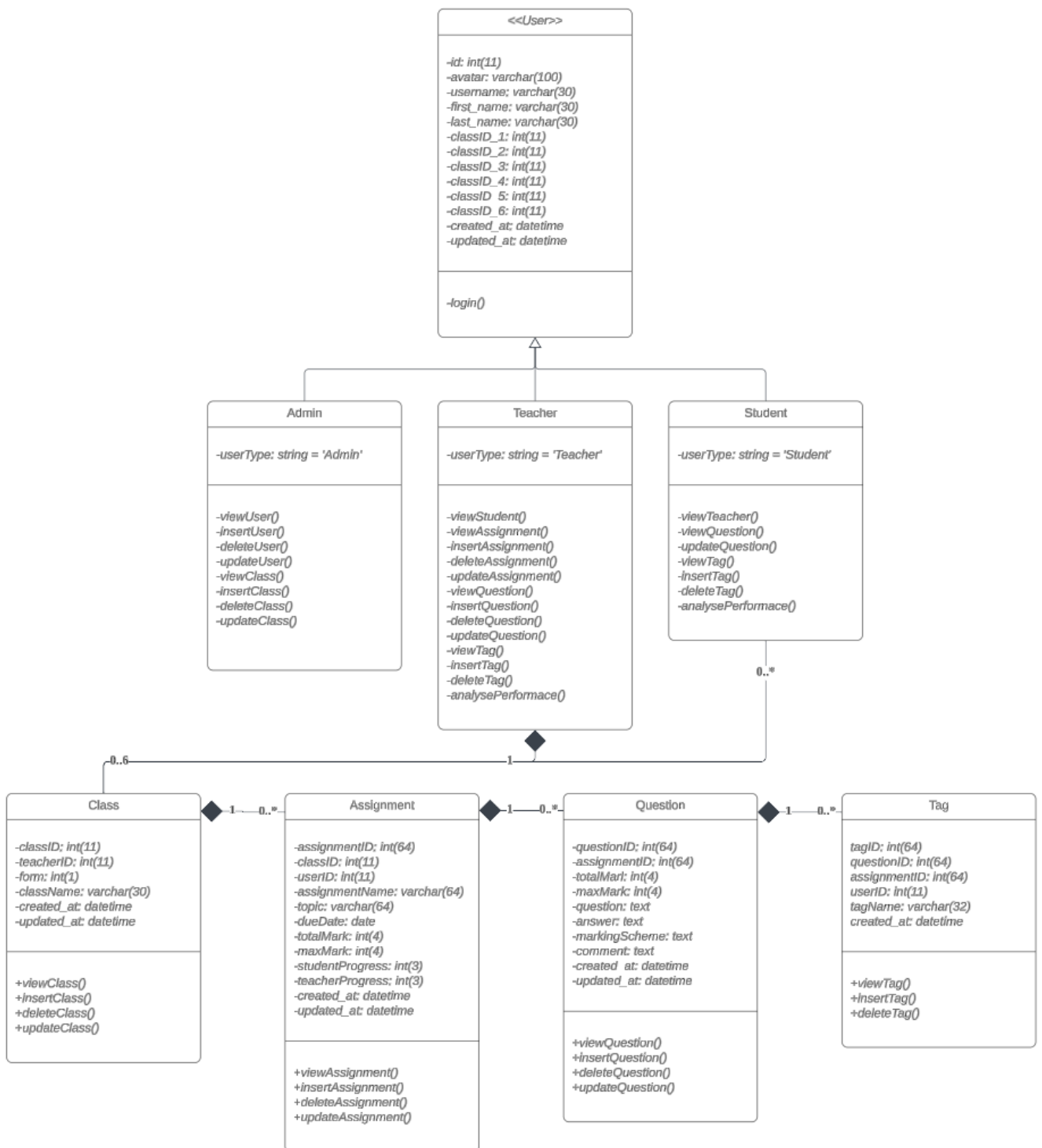
NEED REAL-LIFE EXAMPLES CARELESS !!!

## B4 – System Overview

### B4.1 – System UML Use Case Diagram



## B4.2 – System UML Class Diagram





## B5 – Test Plan

Test #	Action	Method	Successful Criteria
#1	Test SSO authentication, and user access control	Login with 3 different school Google accounts (1 admin account, 1 teacher account, 1 student account) and 1 outsider Google account, check if each of them are redirected to their corresponding webpages.	#1
#2	Test CRUD on users and classes	Using an admin account, CRUD records in the User table and Class table, then check the database if corresponding actions are performed.	#12, #13
#3	Test if all classes of a user are recognized	Login as a student/teacher; after adding classIDs of existing classes to the student/teacher, check if all corresponding classes are displayed in the Sidebar-Classes.	#2
#4	Test if assignments can be posted	Using a teacher account, create an assignment in a class; then, login to a student account in that class, check if the assignment is loaded in to-do list; next, by clicking on the assignment in the to-do list, check if corresponding page is redirected, and check if the assignment loaded is exactly the same with the assignment initially created.	#7, #3
#5	Test if assignments can be done	Using a student account, work on an assignment and submit it; then, login to the responsible teacher account, check if changes are made to the student's assignment.	#9
#6	Test if assignments can be marked	Using a teacher account, mark a student's work, then give some comments, marking schemes; then, login to that student's account, check if the assignment is marked, and the comments with marking schemes can be viewed.	#8, #10
#7	Test if tags can be attached to questions/assignments, and filter the webpage correctly	Using a student/teacher account, add different tags on questions in multiple assignments, then check if questions/assignments are correctly filtered in the webpages.	#5, #6
#8	Test if charts and analyses are correctly displayed	By verifying and changing the data on the database, check if the charts and analyses on the webpages are correct and up-to-date	#4
#9	Test if email is sent to remind student on the overdue assignments	By creating an assignment that will overdue soon, check if any email is sent to the mailbox of the student after a while.	#11