



IMPLEMENTATION OF SQL QUERY CONSTRUCTION TO IMPROVE DATABASE CONCEPT UNDERSTANDING WITH CLOSE-ENDED APPROACH

Research Team

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01 INTRODUCTION





Background



In academics, the learning role of databases includes **understanding the database concepts that are relevant to industry requirements** and database management.

(Zhuoyi et al., 2012)





Background



The **SELECT clause is the main concept** in learning SQL. because the **transition of students' understanding** in exploring other clauses will be **faster**.

(Garner, 2015).



01 To make an effective query, **students need to understand how to extract them**, and **it becomes harder** as the database complexity grows.

(Phillip Garner, 2015).

02 The query complexity is **limited to the short-term memory of the code writer** when retrieving data.

(de Jong, 2010)

03 **SQL Query Formulation can be a challenging task** due to its declarative form of SQL syntax.

(Taipalus, 2019)

Problems



01 To increase understanding, the **practice should** not only be limited to code creation but also **reflects the student's thinking by case study descriptions and problem-solving.**

(Marion et al., 2007)

02 A close-ended approach that has **predefined answers allows students to think logically** about solving case studies within the appropriate context and scope of the problem.

(Lin & Lien, 2013).

03 A **drag-and-drop implementation reduces typing errors** and gives flexibility for the users to adjust code in order.

(Heift, 2003; Price & Barnes, 2015; C.Phewkum, 2019)



Main Reference

01 Online Judge MySQL for Learning Process of Database Practice Course by Dwi Puspitasari (2019)

The implementation of **database practices** in one of the DBMS such as MySQL is very **important as basic skills in the informatics field**

02 A Novel Drag-and-drop SQL Learning Tool by C. Phewkum (2019)

Drag-and-drop are used in many programming environments because it **can improve beginner performance** significantly



Research Objective

To **observe the effect of SQL code construction implementation** with a drag-and-drop method and close-ended approach **to students' understanding** of the overall database concept.

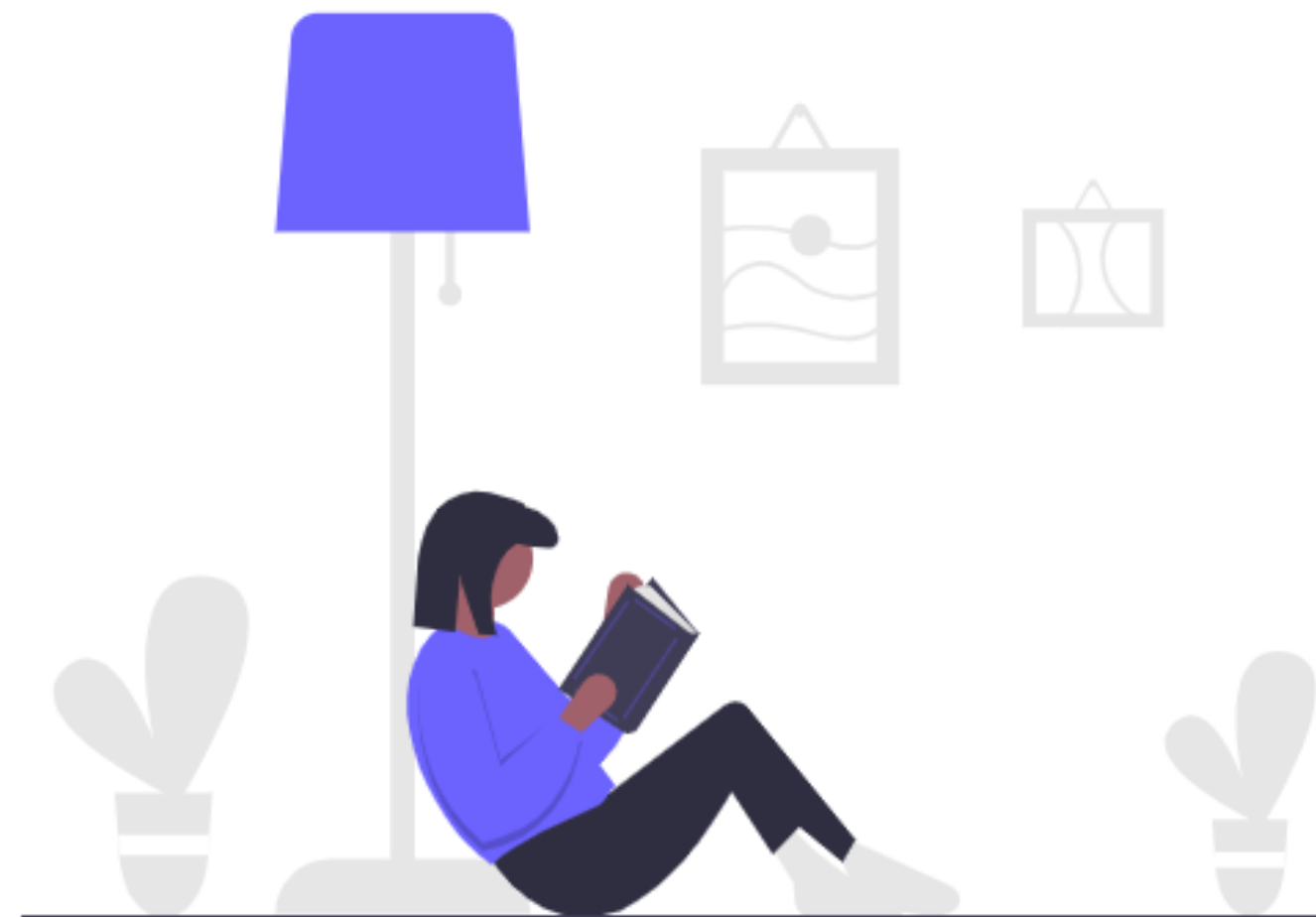




Research Benefits

- 01 **For Researcher :**
Identify whether students who are involved in learning SQL using the drag-and-drop and close-ended approach have an increased understanding of the overall database material
- 02 **For Students:**
Can be used to enhance understanding and experience in learning database concepts, especially in SQL queries.

Research Scope



The application runs on a web platform

Using MySQL database



SQL queries is focused on SELECT statements



The application will be used by **students and lecturers** in Information Technology Major in State Polytechnic of Malang





Research Problem

How is the effect of SQL Code construction with drag-and-drop and close-ended approach on students' understanding of overall database concepts?



02

LITERATURE REVIEW



Literature Review

Drag and Drop Concept

- 01 **The benefit** of drag-and-drop implementation is **to make students more focused on logic** in solving the case studies without worrying about syntax errors (Cheung et al., 2009)
- 02 With a drag-and-drop concept, **students tend to understand the syntax better** with an average of 3.90 out of 5. (Phewkum et al., 2019)



Past Research - Application Concept

Keyword

SELECT

DISTINCT

FROM

JOIN

ON

USING

LEFT

RIGHT

OUTER

WHERE

AND

OR

NOT

BETWEEN

LIKE

GROUP BY

HAVING

ORDER BY

ASC

DESC

ALL

ANY

Keyword Value
NYC
NYC

Symbol

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Table

customers

orderdetails

orderNumber

productCode

quantityOrdered

priceEach

orderLineNumber

payments

products

orders

employees

productlines

offices

SELECT

*

FROM

customers

WHERE

city

=

NYC

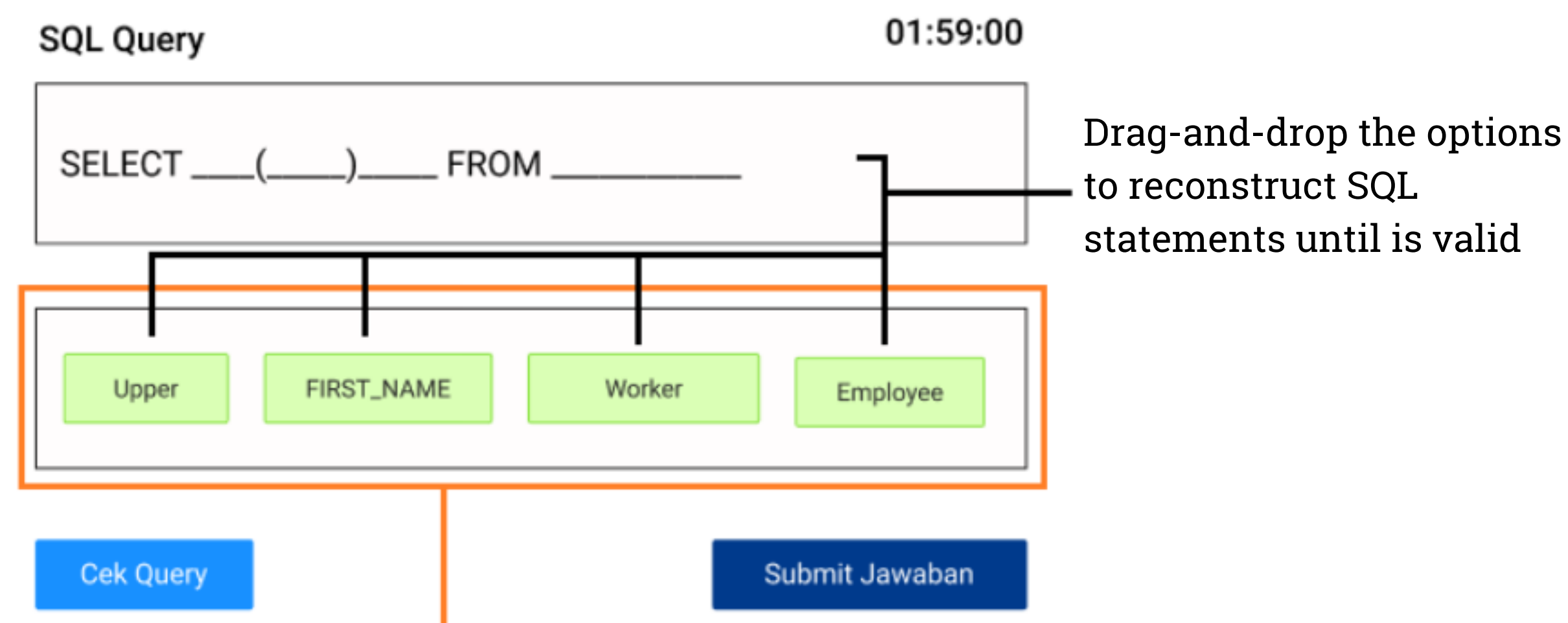
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131	Land of Toys Inc.	Lee	Kwai	2125557818	897 Long Airport Avenue		NYC	NY	10022	USA	1323	114900
151	Muscle Machine Inc	Young	Jeff	2125557413	4092 Furth Circle	Suite 400	NYC	NY	10022	USA	1286	138500
181	Vitachrome Inc.	Frick	Michael	2125551500	2678 Kingston Rd.	Suite 101	NYC	NY	10022	USA	1286	76400
424	Classic Legends Inc.	Hernandez	Maria	2125558493	5905 Pompton St.	Suite 750	NYC	NY	10022	USA	1286	67500
456	Microscale Inc.	Choi	Yu	2125551957	5290 North Pendale Street	Suite 200	NYC	NY	10022	USA	1286	39800

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Application Concept - Students



Predefined answers
(Close-ended approach)



Application Concept - Lecturers

Create New Practice Set

Query

SELECT ×

COUNT ×

Nama ×

Mahasiswa ×

Murid ×

Answer

Correct SQL query . . .

SQL Parts that will be dragged and dropped by students

Define Correct SQL Query

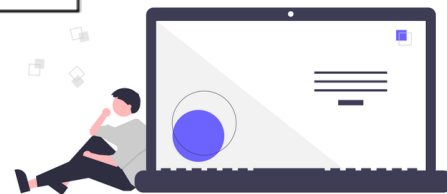
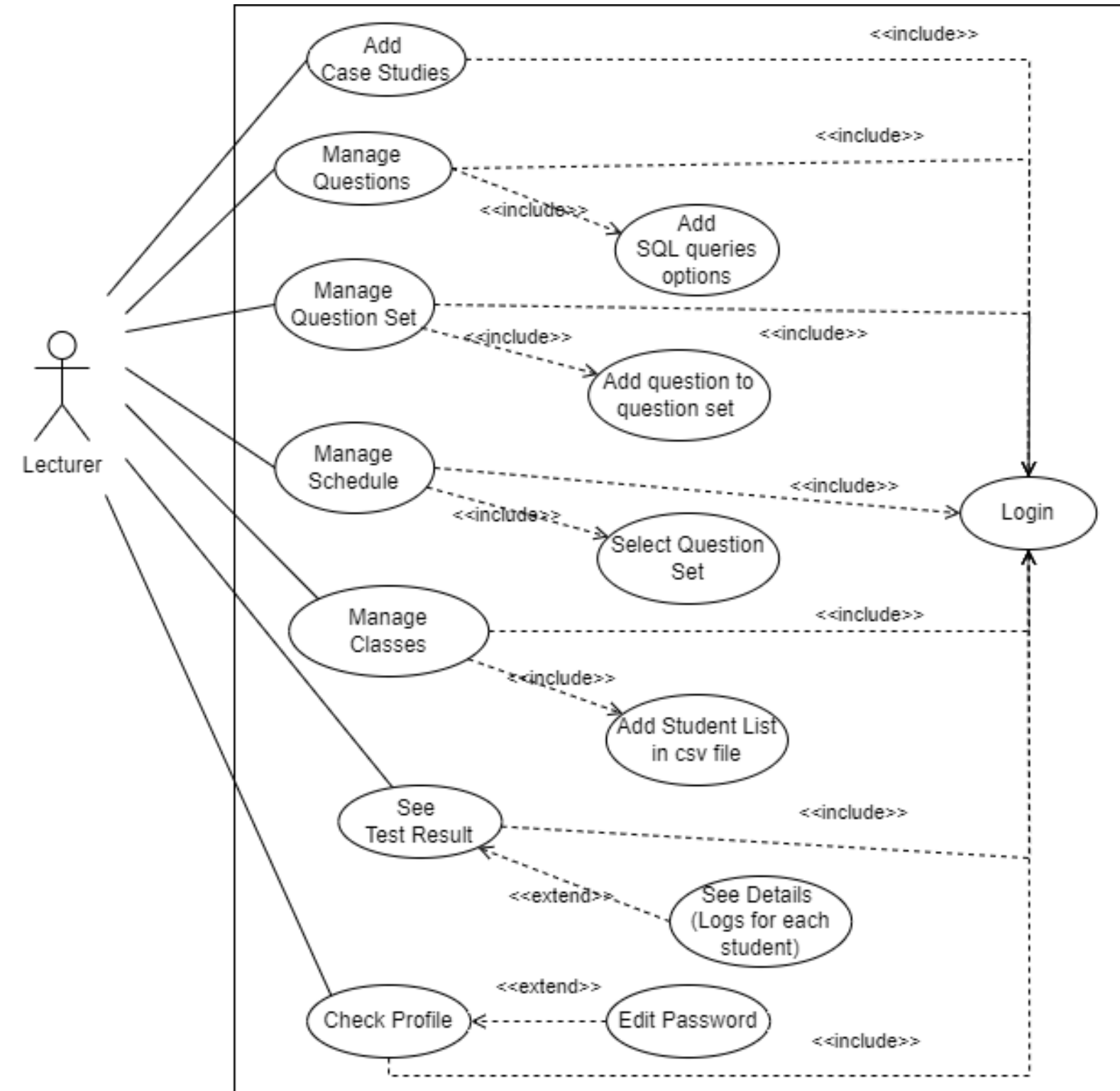
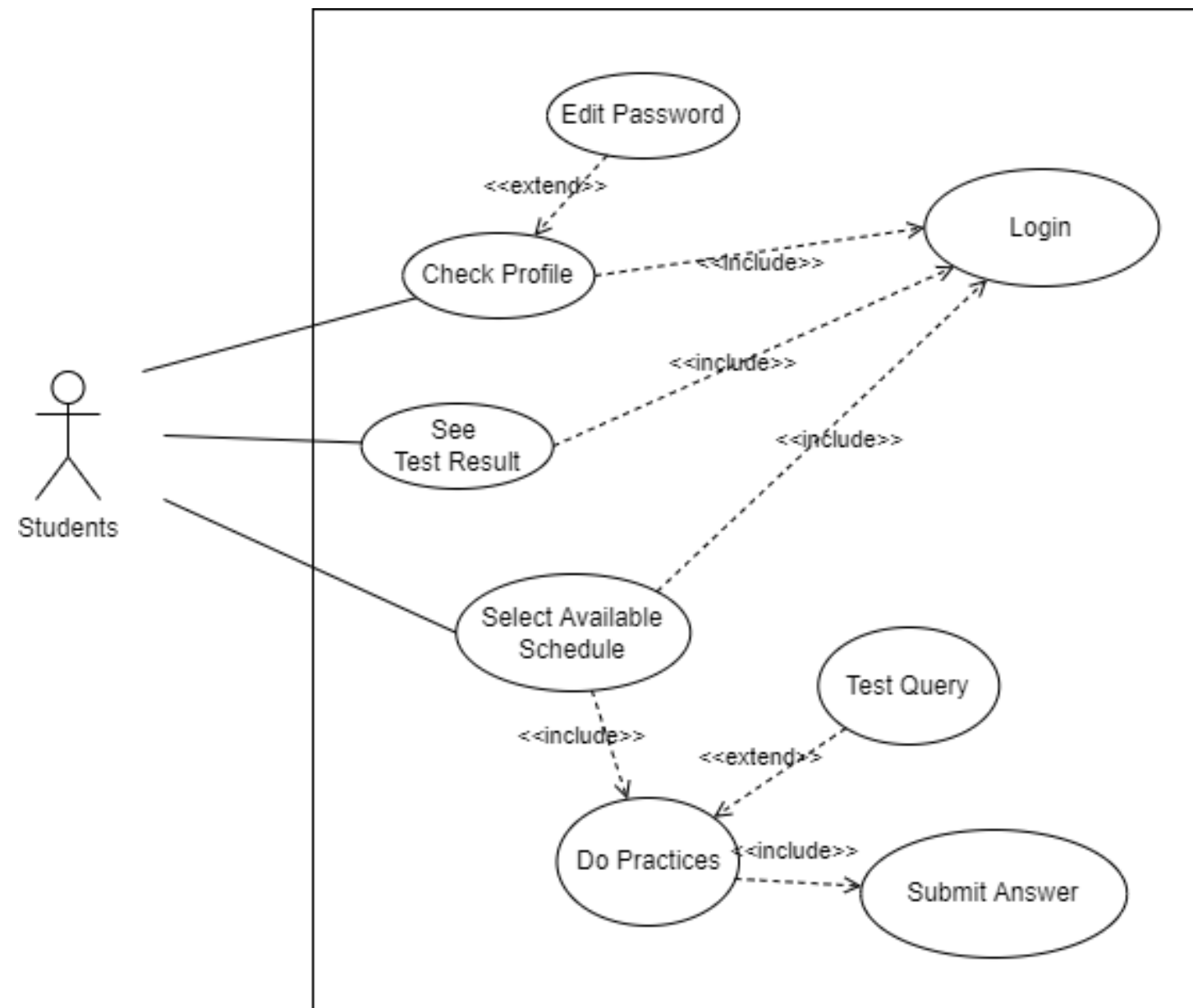


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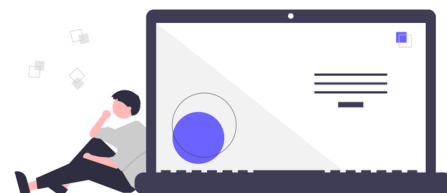
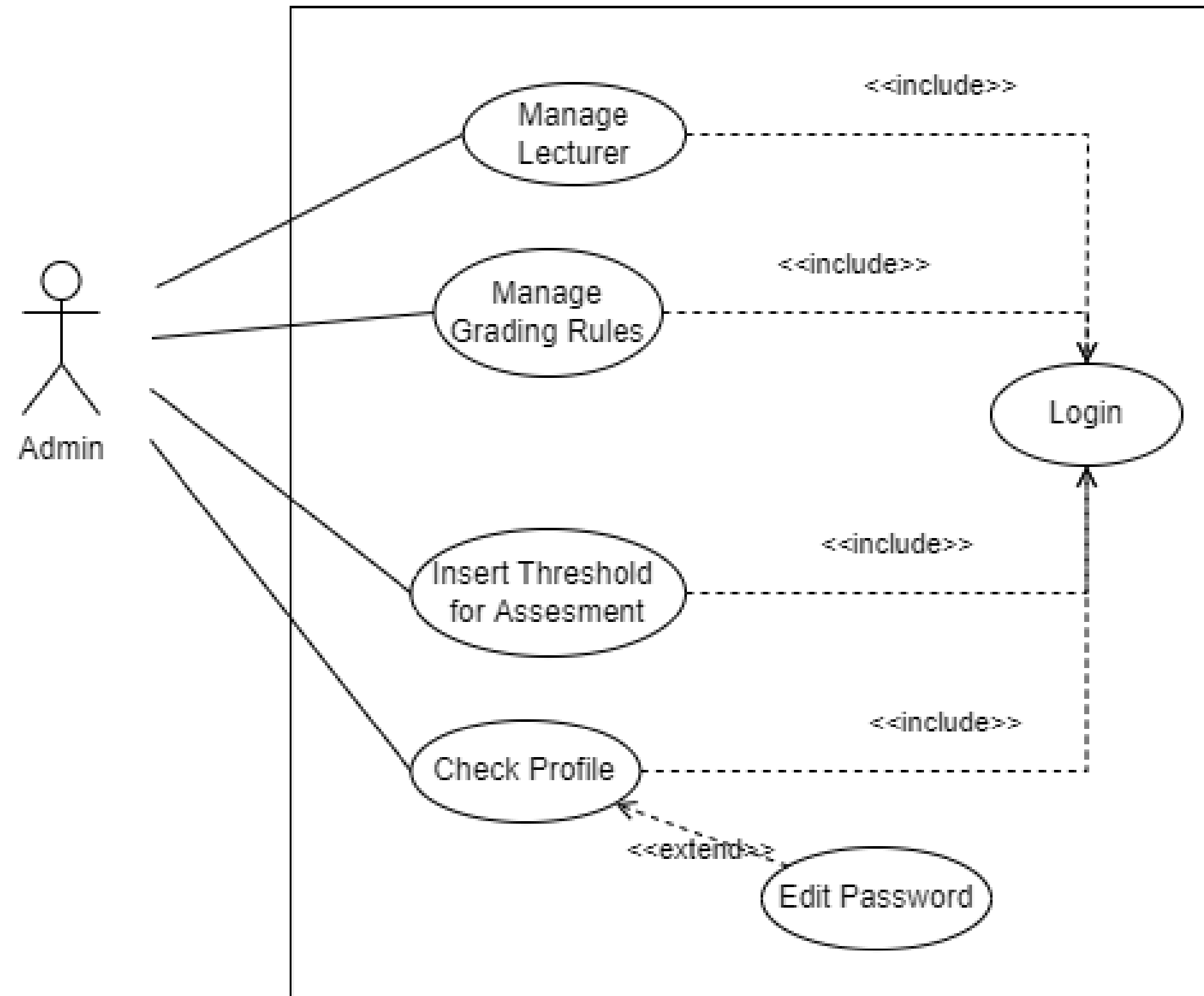
SYSTEM METHODOLOGY



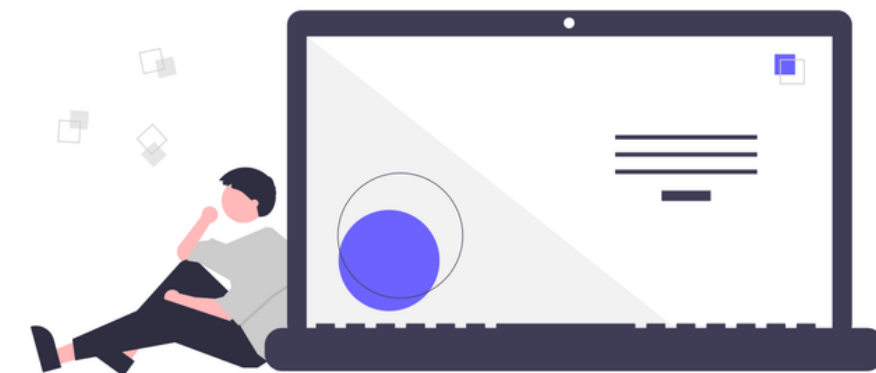
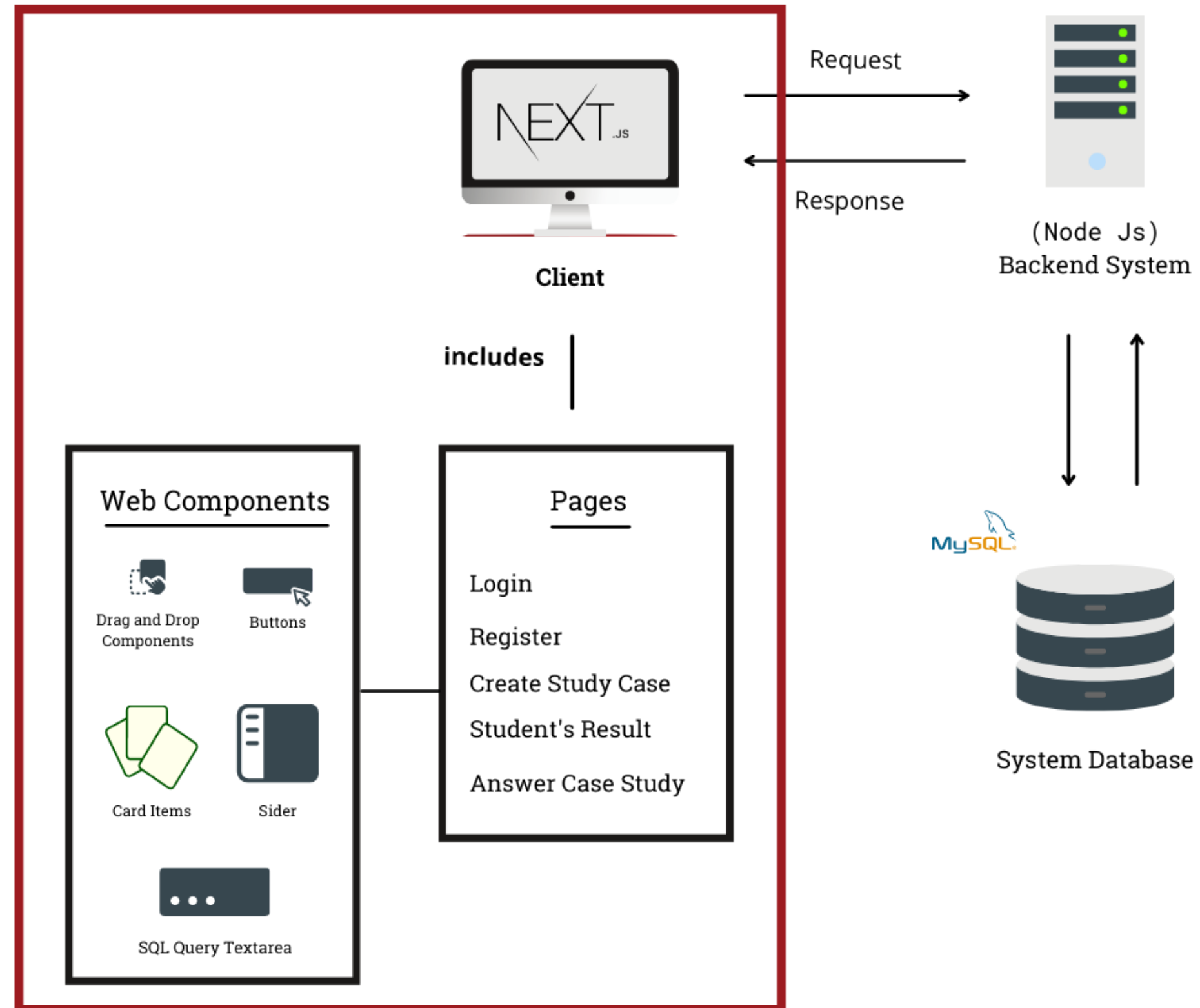
Use Case Diagram



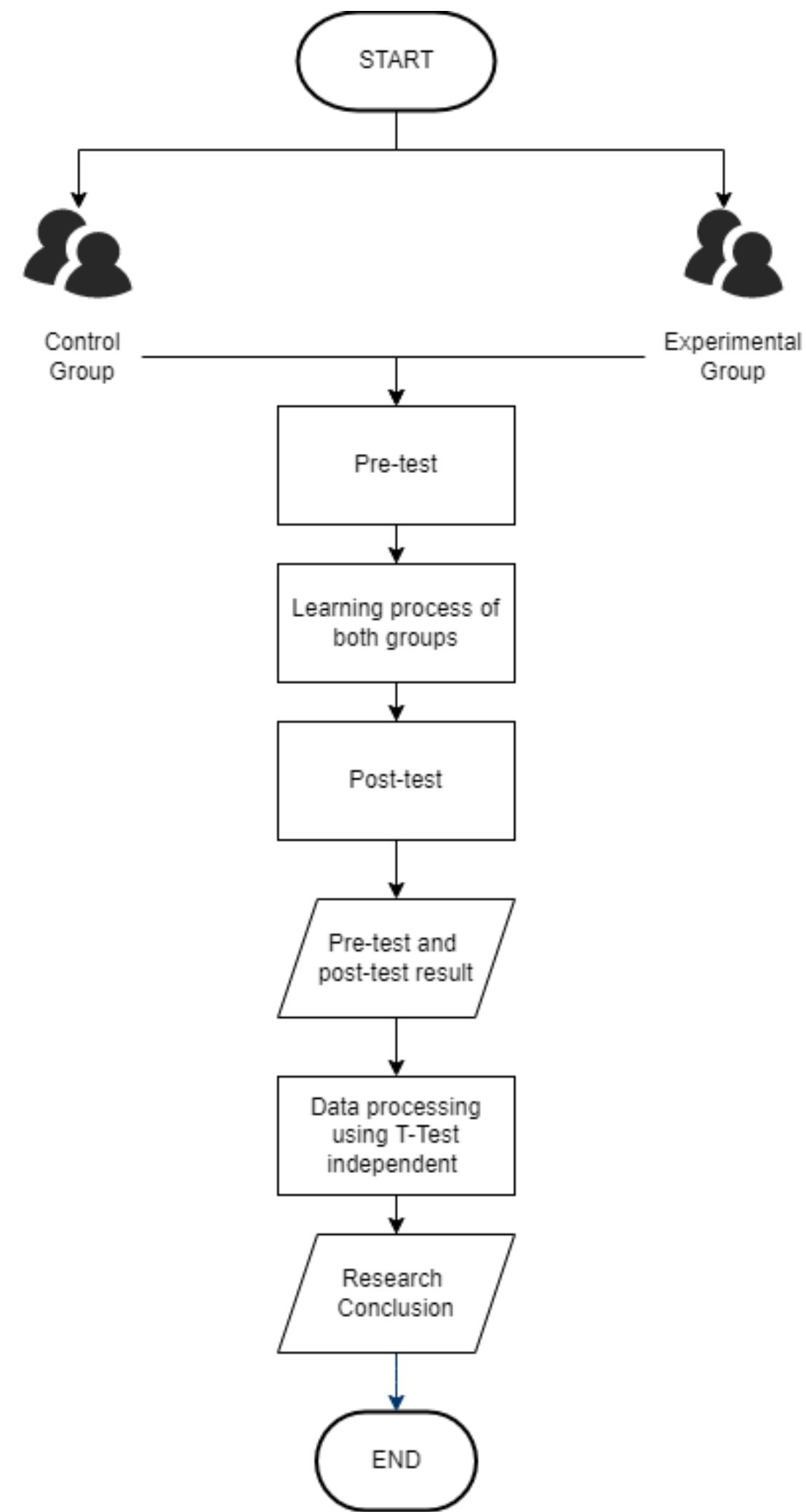
Use Case Diagram



System Architecture



System Testing





Thank you

