



# SOFTWARE ENGINEERING PROJECT

JAN 2025 TERM - TEAM 1

PROJECT PRESENTATION

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# OUR PRESENTATION TOPICS

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**Team  
Introduction**

1

**Problem  
Statement**

2

**Identified  
Users**

3

**User Stories**

4

**Demonstration  
with  
Storyboard**

5

**Tech Stack**

6

# THE TEAM

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**Siddharth Umathe**



**Anjali Galav**



**Amit Kulkarni**



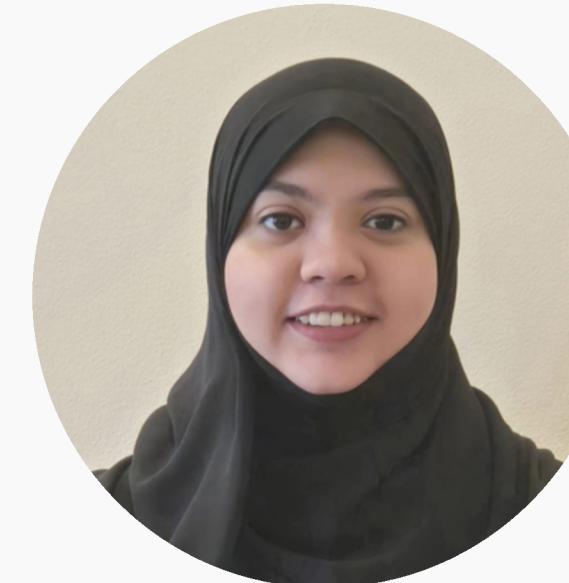
**Sandeep Kumar**



**Kajol Singh**



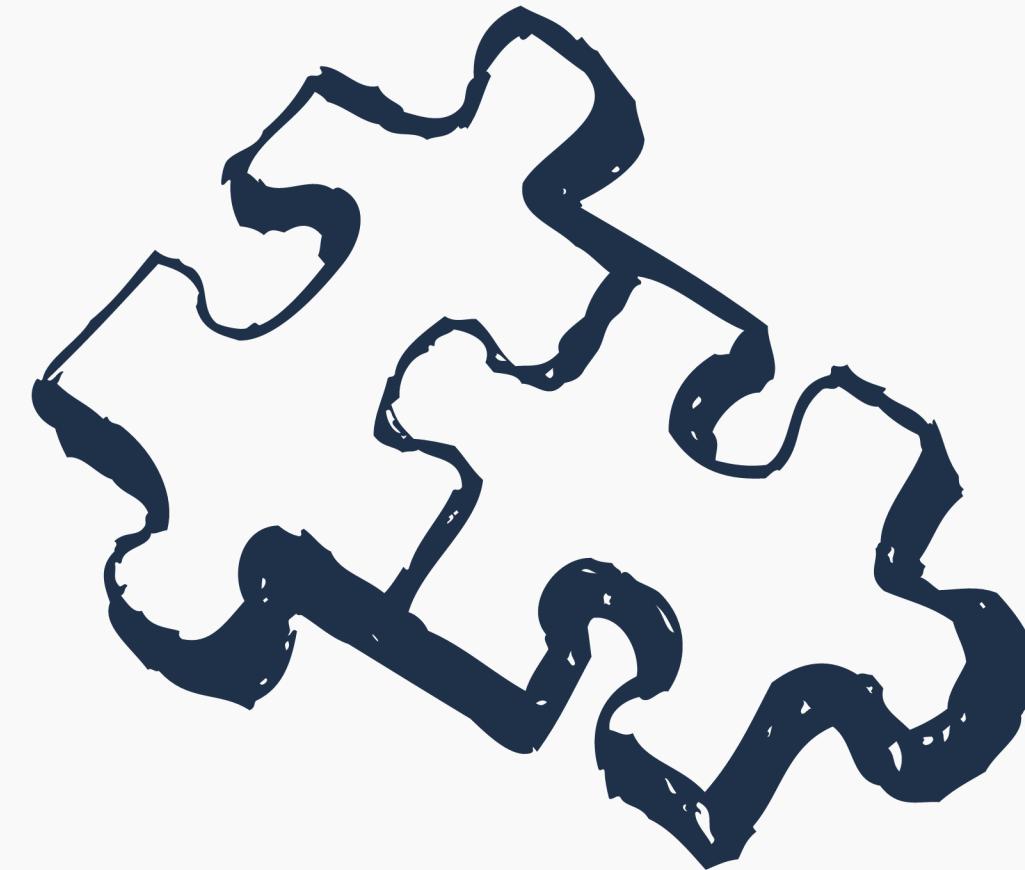
**Jyotiraditya Saha**



**Saima Shroff**

# PROBLEM STATEMENT

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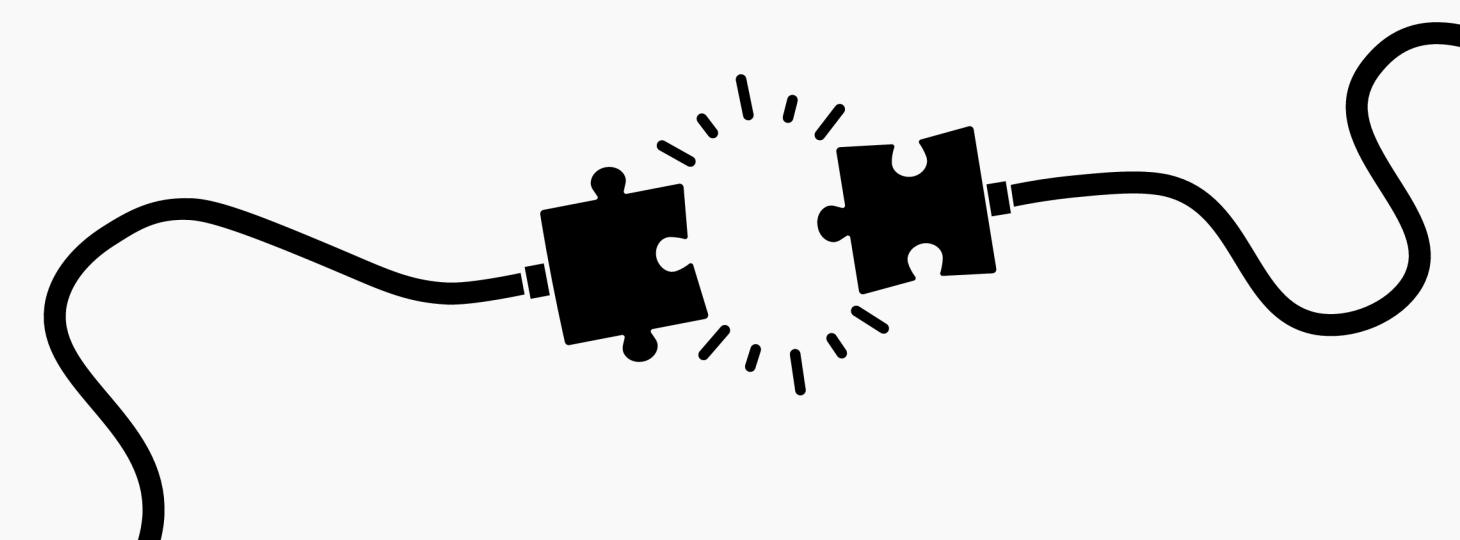


## CHALLENGE

With the rapid advancement of generative AI technologies, there is a need to integrate these technologies into the SEEK portal to enhance the learning experience for students. The current system lacks personalized guidance and support, which can hinder students' ability to navigate course material effectively, improve study habits, and maintain academic integrity.

## OBJECTIVE

Develop an AI agent that serves as a virtual guide for students enrolled in the IITM BS program.

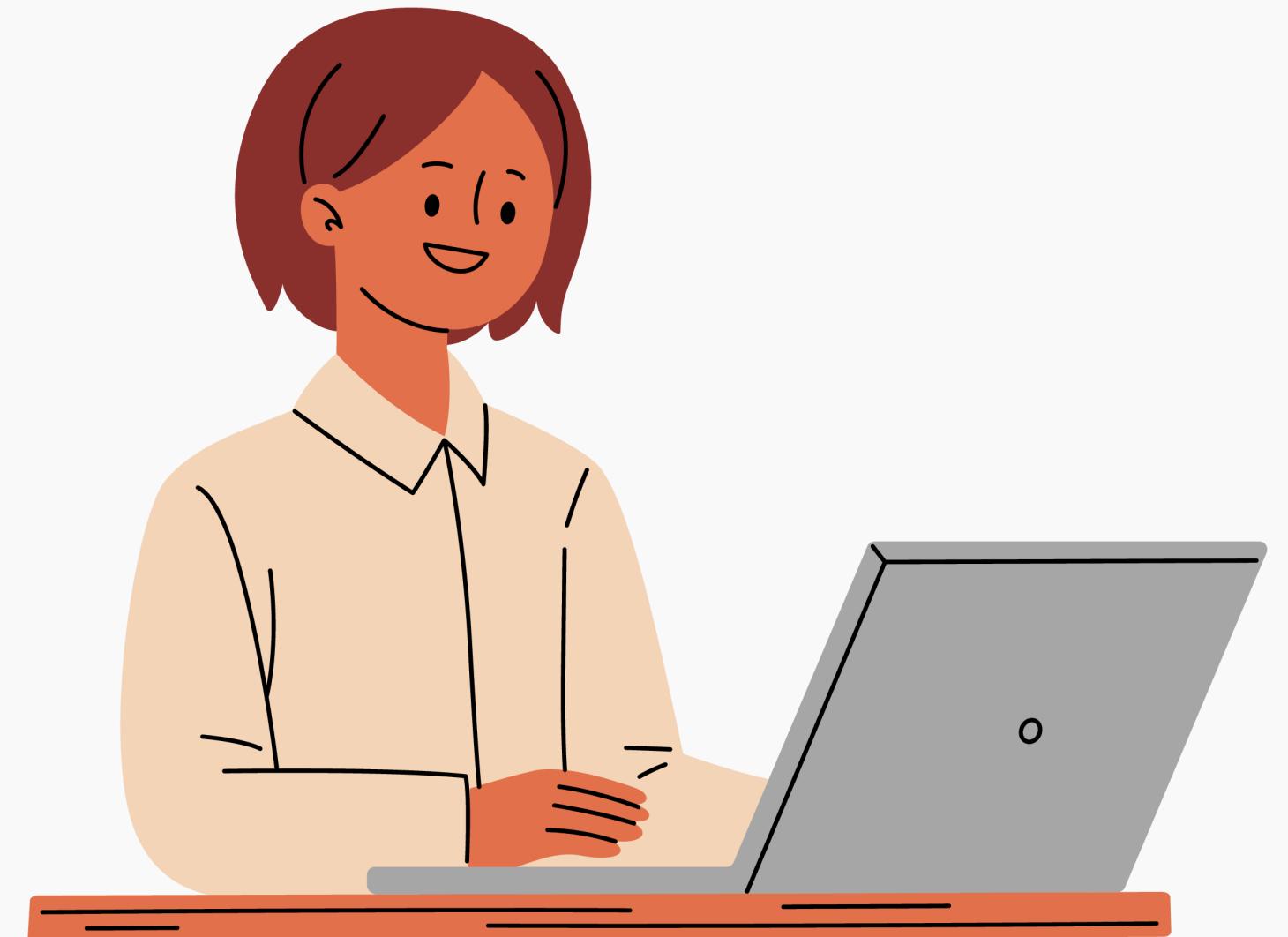


# IDENTIFIED USERS

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## PRIMARY USERS: STUDENTS

The primary audience who use the AI agent to get guidance on course materials, assignments, and quizzes. They rely on the agent to enhance their study strategies and locate relevant resources without receiving direct answers, fostering self-learning.



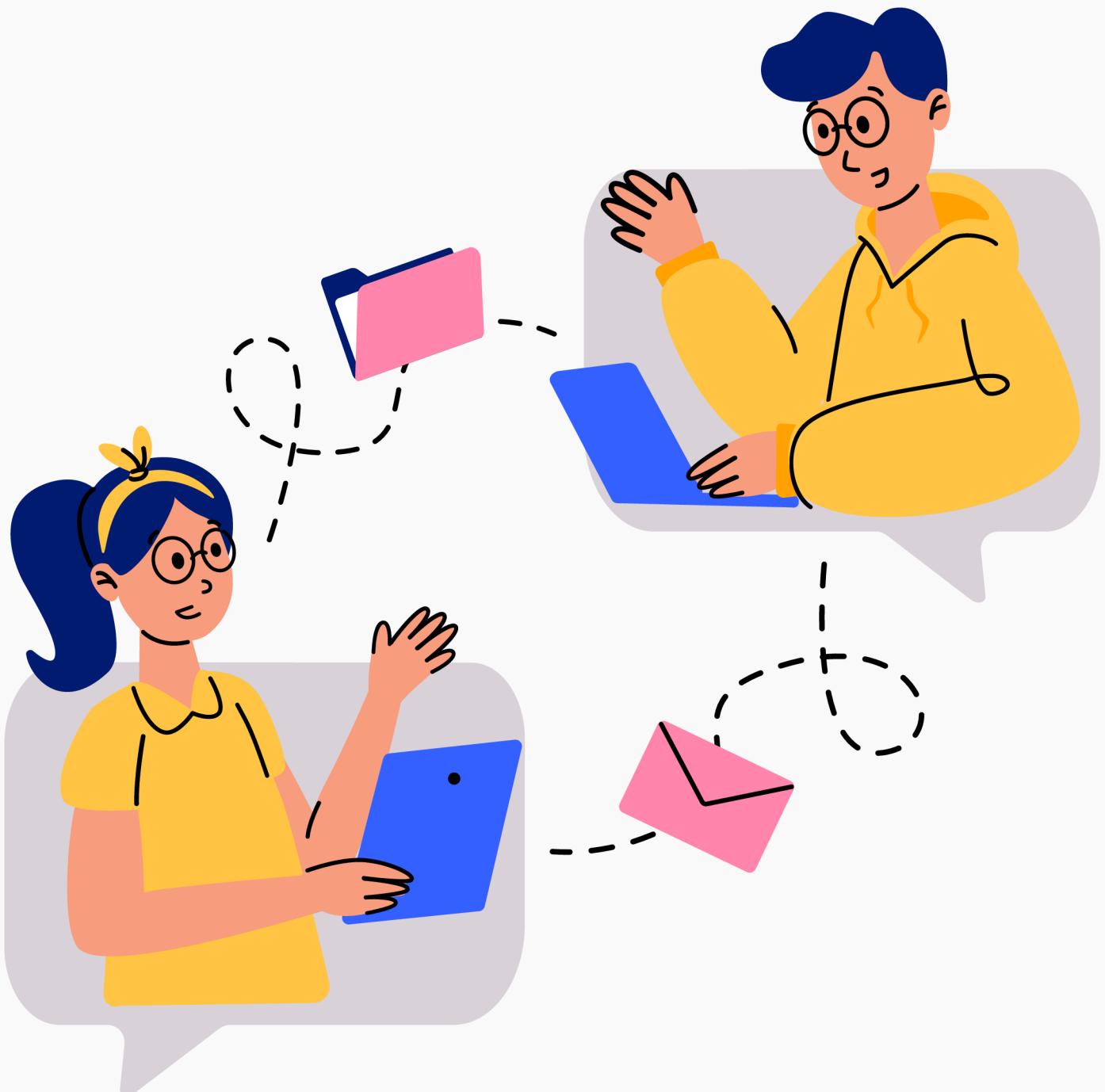
# IDENTIFIED USERS

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## SECONDARY USERS: COURSE INSTRUCTORS & TEACHING ASSISTANTS

**Course instructors** indirectly interact with the AI agent by relying on its ability to guide students effectively. Instructors benefit from the agent's role in addressing routine queries and nudging students toward effective study practices, which supports their teaching efforts.

**TAs** may refer students to the AI agent for routine academic guidance, allowing them to focus on more complex or personalized student needs.



# IDENTIFIED USERS

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## TERTIARY USERS: PROFESSORS, SUPPORT TEAM & DEVELOPERS

**Professors** deliver lectures and play an essential role in designing and overseeing the course content but do not interact with the SEEK portal directly.

The **support team** manages technical issues and addresses students' non-academic concerns related to the AI agent or SEEK portal.

The **developers and maintainers** are responsible for building, testing, and ensuring the ongoing functionality of the AI agent.



# USER STORIES

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01

**As a student,**  
**I want** the AI agent to summarize key concepts from lecture videos into bullet points,  
**so that** I can review and understand the main ideas without re-watching the entire content.

02

**As a student,**  
**I want** the AI agent to provide a comprehensive summary of all the content covered during the week, including key concepts and activities,  
**so that** I can review the entire week's material at once without needing to revisit individual lectures or resources.

03

**As a student,**  
**I want** the AI agent to persistently remember my last 5 queries and maintain the context of our conversations,  
**so that** I can have seamless and coherent conversations without repeating information and avoid redundant discussions.

04

**As a student,**  
**I want** the AI agent to answer academic queries related to specific topics,  
**so that** I can quickly access relevant course material and deepen my understanding without wasting time searching through multiple resources.

# USER STORIES

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05

**As a student,**  
**I want** the AI agent to generate 10 practice questions tailored to the specific topics I request,  
**so that** I can effectively test my understanding and address my weak areas with focused practice.

06

**As a student,**  
**I want** the AI agent to create mock quizzes or end-term exam simulations tailored to the course content,  
**so that** I can practice under exam-like conditions and identify areas for improvement.

07

**As a student,**  
**I want** the AI agent to generate concise notes with bullet points for the specific topics I request,  
**so that** I can quickly and effectively review key concepts to prepare for assignments and quizzes.

08

**As a student,**  
**I want** the AI agent to recommend specific topics to review if my performance in a mock quiz is below 80%,  
**so that** I can focus on weak areas and improve my understanding quickly.

# USER STORIES

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09

**As a** student,  
**I want** the AI agent to analyze my programming assignment errors and explain the underlying issues,  
**so that** I can understand what went wrong and learn how to fix them effectively.

10

**As a** teaching assistant,  
**I want** the AI agent to handle routine academic queries from students,  
**so that** I can focus on providing personalized support for more complex issues.

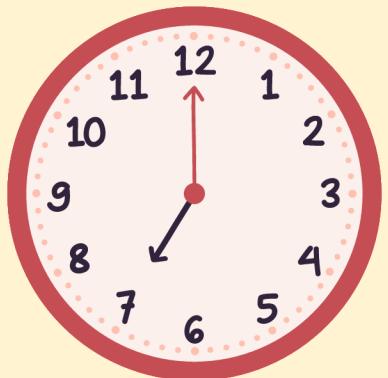
11

**As a** course instructor,  
**I want** the AI agent to generate mock quizzes and end-term exams tailored to the course syllabus and difficulty levels,  
**so that** students can effectively practice and improve their readiness for the actual exams.

12

**As a** support team member,  
**I want** to track and analyze usage statistics for the AI agent's features,  
**so that** I can monitor feature adoption, identify user preferences, and investigate underutilized functionalities.

# DEMONSTRATION WITH STORYBOARDS



This lecture was so long.  
I can't afford to spend  
another hour  
rewatching this. There  
has to be a better way  
to review!

## Machine Learning Practices

### Course Introduction

#### Week 1

1.1: Intro to MLP

**1.2: Scikit-Learn**

Week 1 Summary

Programming Assignment 1

Graded Assignment 1

#### Week 2

#### Week 3

#### Week 4

Generate Mock Quiz 1

#### Week 5

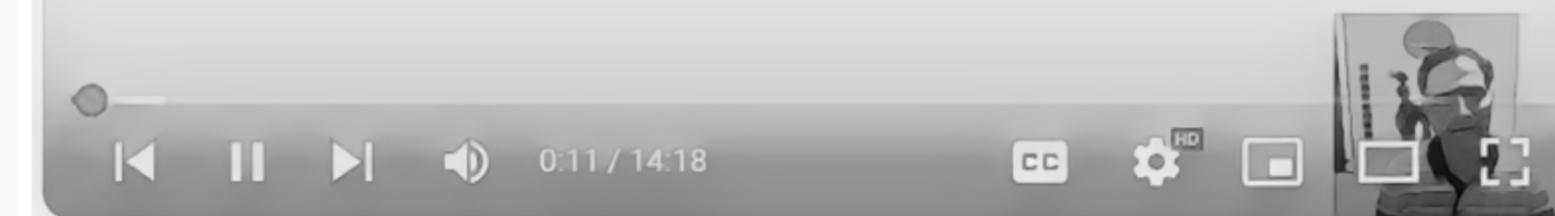
#### Week 6

#### Week 7

## 1.2: Scikit-Learn



# Introduction to Scikit-Learn (sklearn)



Summarize Lecture

### Lecture Summary

Scikit-learn is a Python library for machine learning, built on NumPy, SciPy, and Matplotlib. It supports tasks like classification, regression, clustering, and preprocessing through a simple API. Key steps include:

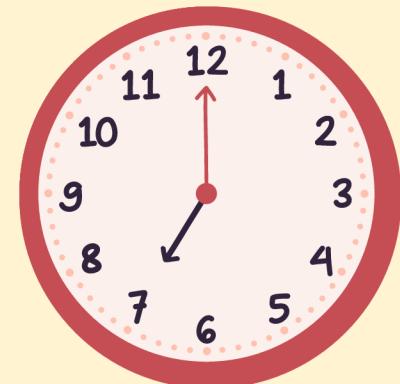
**1. Install:** pip install scikit-learn.

Copy Text

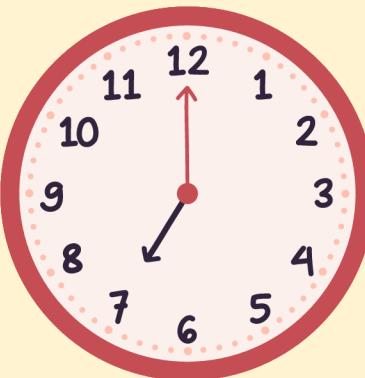
Ask Kia



This saved me so much time! I understand the main points now, and I'm ready for the assignment.



To be Revised  
Week 1  
Week 2  
Week 3  
Week 4



So many lecture  
videos to revisit  
before Quiz 1!



## Machine Learning Practices

### Course Introduction

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#### Week 1 Summary

Programming Assignment 1

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### Week 2

### Week 3

### Week 4

#### Generate Mock Quiz 1

### Week 5

### Week 6

### Week 7

# Week 1 Summary

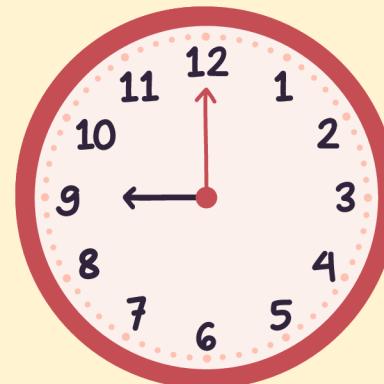
Week 1 Summary goes here ...

- Bullet point 1
- Bullet point 2

Download as PDF 

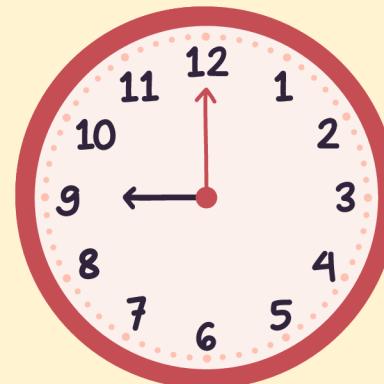
To be Read  
Week 1  
Week 2  
Week 3  
Week 4

Ask Kia 



Finally, a way to catch up without losing sleep!"

To be Revised  
Week 1 ✓  
Week 2 ✓  
Week 3 ✓  
Week 4 ✓



## Machine Learning Practices

Course Introduction

Week 1

Week 2

Week 3

Week 4

Generate Mock Quiz 1

Week 5

Week 6

Week 7

Week 8

Generate Mock Quiz 2

Week 9

Week 10

## Mock Quiz 1

1. What is the full form of ML?

1 point

Machine Language

Machine Learning

Macro Learning

2. Which of the following is a type of supervised learning?

1 point

Clustering

Regression

Dimensionality Reduction

Association Rule Mining

Check Score

Your Assignment Score Is 1/2

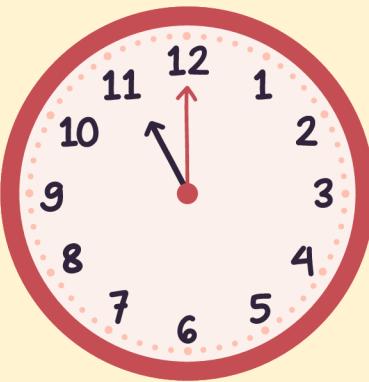
Topics For Review:

Kia's Feedback Here

Download Report

Ask Kia

Topics to Review  
Regression  
RFC  
Tensorflow





# Hello, Anjali!

I am KIA, your virtual companion at SEEK.

You may click on one of the options below or type in your query.



## Academic Queries

Ask academic doubts or questions



## Generate Notes

Get topic-specific bullet-point notes



Ask Kia anything here...





## Generate Topic-Specific Notes

Regres

Search

Regression

Auto-regressive model

Linear Regression

Probabilistic Regression Model

Logistic Regression

Reset Session



## Notes on Regression

Topic notes go here...

- Bullet point 1
- Bullet point 2

Download as PDF 

Topics to  
Regression  
RFC  
Tensorflow

Reset Session

## Machine Learning Practices

Course Introduction

Week 1

Week 2

Week 3

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Week 9

Week 10

Week 11

Week 12

Generate Mock End-Term Quiz

Supplementary Content

Generate Topic-Specific Questions

## Generate Topic-Specific Questions



regress

Search

Regression

Auto-regressive model

Linear Regression

Probabilistic Regression Model

Logistic Regression

# Wrong output

Ask Kia

## Machine Learning Practices

Course Introduction

Week 1

Week 2

Week 3

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Week 9

Week 10

Week 11

Week 12

Generate Mock End-Term Quiz

Supplementary Content

Generate Topic-Specific Questions



## Practice Questions on **Regression**

1. Which of the following is NOT a type of regression?

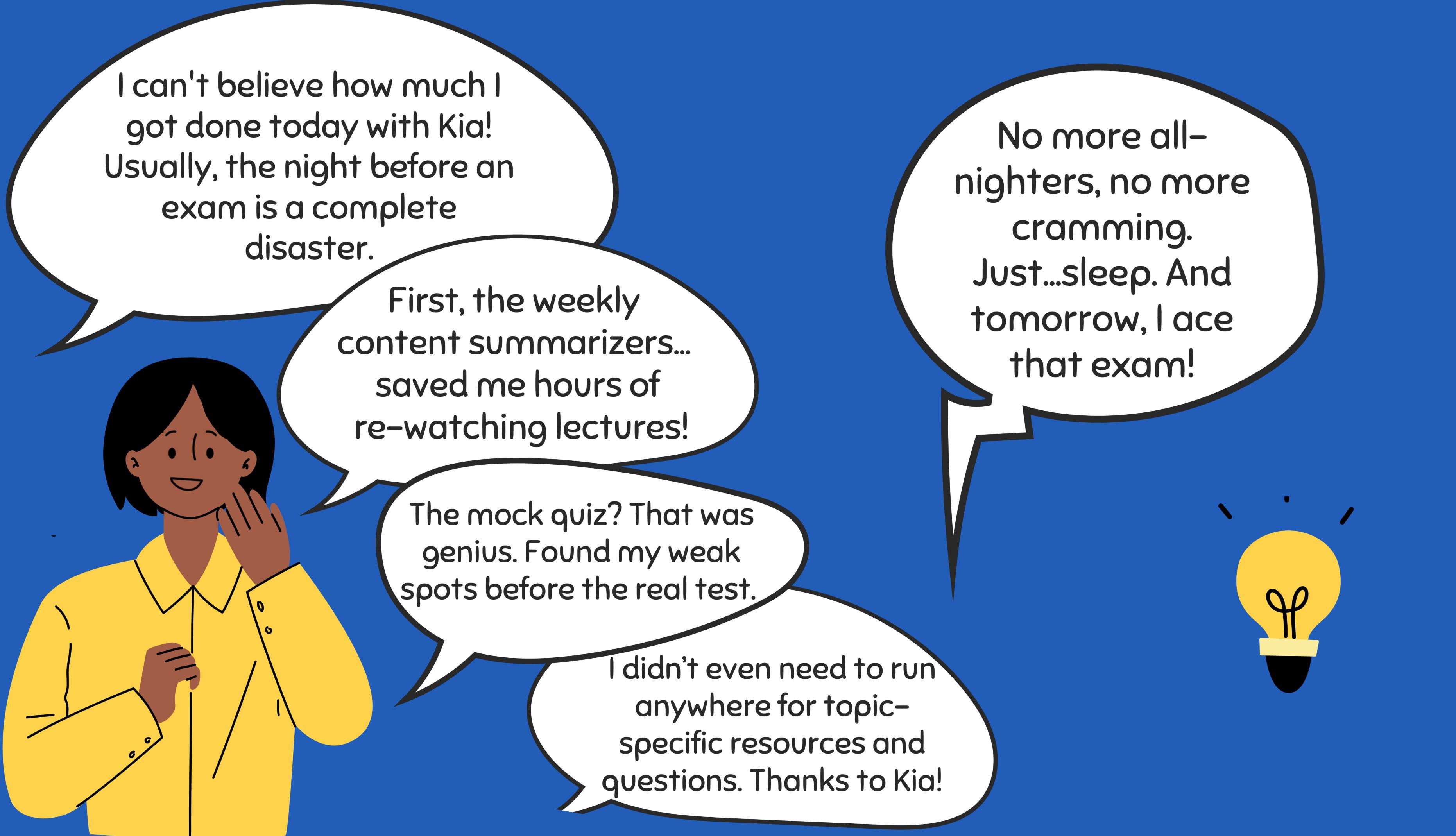
- Polynomial Regression
- K-Means Regression
- Random Forest Regression

2. Which of the following statements about Linear Regression are true?

- It assumes a linear relationship between independent and dependent variables
- It can be affected by multicollinearity among features
- It works well with categorical target variables
- It minimizes the sum of squared errors

Check Score

Ask Kia



I can't believe how much I got done today with Kia! Usually, the night before an exam is a complete disaster.

First, the weekly content summarizers... saved me hours of re-watching lectures!

The mock quiz? That was genius. Found my weak spots before the real test.

I didn't even need to run anywhere for topic-specific resources and questions. Thanks to Kia!

No more all-nighters, no more cramming. Just...sleep. And tomorrow, I ace that exam!





I don't fully understand how  
multiple regression works.  
Searching through all these  
lecture slides is taking forever!

If only I could get a quick and  
clear explanation without  
digging through multiple  
resources.



## Hello, Anjali!

I am KIA, your virtual companion at SEEK.

You may click on one of the options below or type in your query.



### Academic Queries

Ask academic doubts or questions



### Generate Notes

Get topic-specific bullet-point notes



Ask Kia anything here...



# Academic Query Support



Hey There! How can I help you today?

When should I use simple versus multiple regression?



Simple and multiple regression are both techniques used to model relationships between variables, but they differ in complexity and purpose. Here's when to use each:

## **When to Use Simple Regression**

- Single Predictor Focus:**

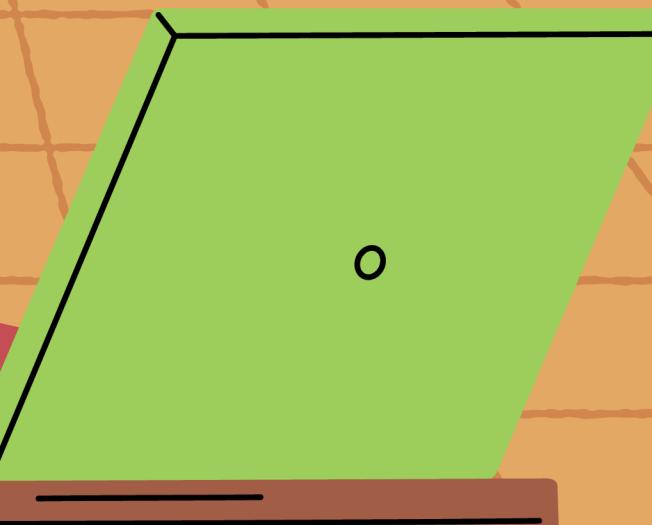
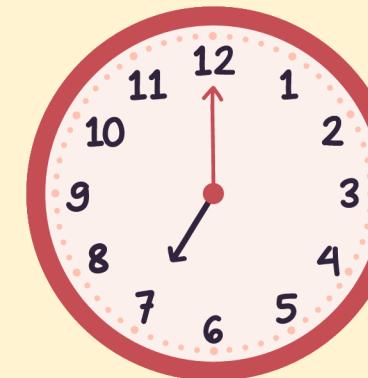
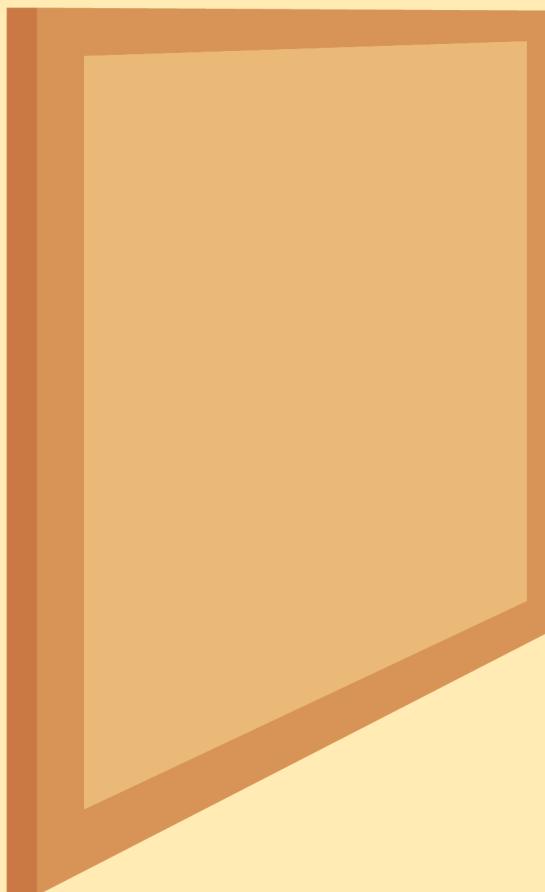
Use simple regression when you believe that one independent variable is the primary driver of your

Ask a question



Reset Session

Yesterday Kia explained when to use simple vs. multiple regression. But now I need to know how to decide which independent variables are important in multiple regression. Will I have to explain everything again?





## Academic Query Support



Hey There! How can I help you today?

How do I decide which independent variables to include in multiple regression?



Since you **previously asked** about when to use simple and multiple regression, let me build on that.

To select the right independent variables for multiple regression, consider:

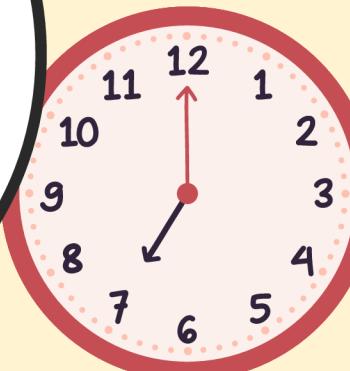
- **Correlation Strength:** Use variables that show a

Ask a question



Reset Session

Kia is just amazing! I don't have to keep re-explaining my doubts, it keeps track of what I ask.



From now on, I'll use this for all my study queries. No redundant discussions!

What does this error  
mean? 'TypeError:  
NoneType object is not  
callable'? I have no idea  
where this went wrong!

## Machine Learning Practices

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Week 6

Week 7

## Programming Assignment 1: Train an SVM Classifier

Write a code in Python to train an SVM Classifier with specific parameters and datapoints.

# Wrong code

0/4 Test cases passed

 Submit

### Output

# Wrong output

 Explain Error

 Ask Kia

## Machine Learning Practices

Course Introduction

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Week 6

Week 7

## Programming Assignment 1: Train an SVM Classifier

Write a code in Python to train an SVM Classifier with specefic parameters and datapoints.

# Wrong code

0/4 Test cases passed

Submit

### Output

TypeError: NoneType object is not callable

Explain Error

#### Here's what this error means:

- A function or variable in your code is being treated as something that can be called, but it's actually **None**.
- This usually happens when you accidentally overwrite a function with a variable of the same name or forget to return a value from a function.

Ask Kia



Finally! Now I know what this error means and how to debug it if I see it again.

Kia makes error messages so much easier to understand. It's like having a tutor who explains things in simple English!

# TECH STACK

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## Frontend

- Vue 3 CLI
- Vue Router
- VueMarkdown
- JavaScript
- Bootstrap
- HTML and CSS
- ESLint
- Axios

## Backend

- Flask
- SQLAlchemy ORM
- JWT Authentication
- Werkzeug Security
- Google OAuth2 API
- PDFKit
- Pytest
- Thunderclient

## GenAI

- LangChain
- Gemini 1.5 Flash
- HuggingFace
- ChromaDB

## General Technologies

- GitHub
- Jira
- Discord
- Figma
- PlantUML
- Swagger Editor

# THANK YOU