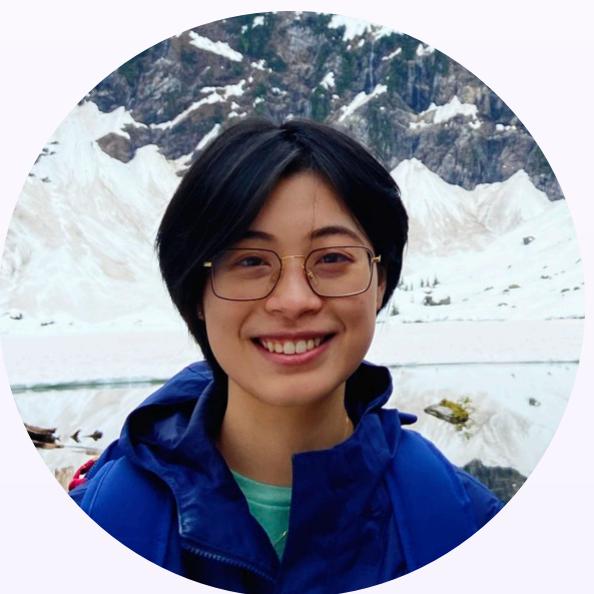


# Final Presentation

## Educational Process Mining Team

December 15 2021

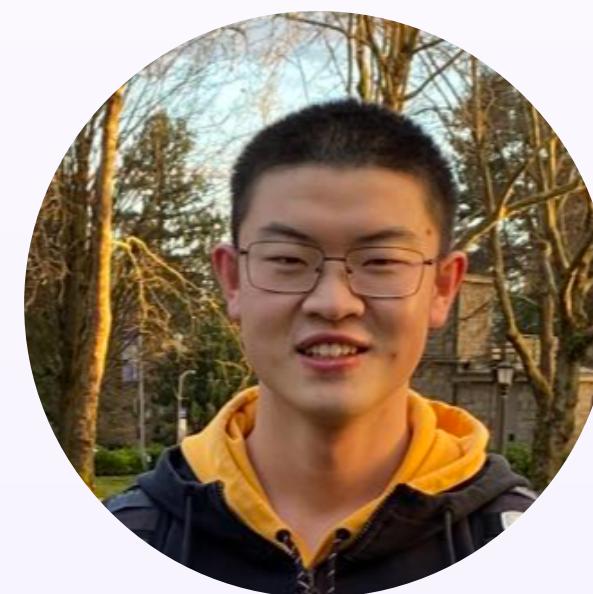
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**Web Development Team**

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# Background



## Popularity of **Online Education** ↑

**Benefits** compared to traditional education:

- It enables students to set their own learning pace
- It allows for a customized learning experience.



### To realize/maximize benefits:

it is essential to make good use of the **log data** generated from online learning platforms.

**Log data** are time-stamped records of student actions (e.g., mouse clicks, online duration, keystrokes...)

Making sense of log data can help educators and students gain insight into

- Problem-solving behaviors
- Metacognitive processes
- Motivation, persistence, and engagement



### Challenges:

it is difficult to interpret large amounts of log data

# Objective

Our group focuses on developing a **web-based tool** that presents log data in meaningful and useful way for instructors and students.

# Dataset

Our [dataset](#) is publicly available on the UCI machine learning repository website.

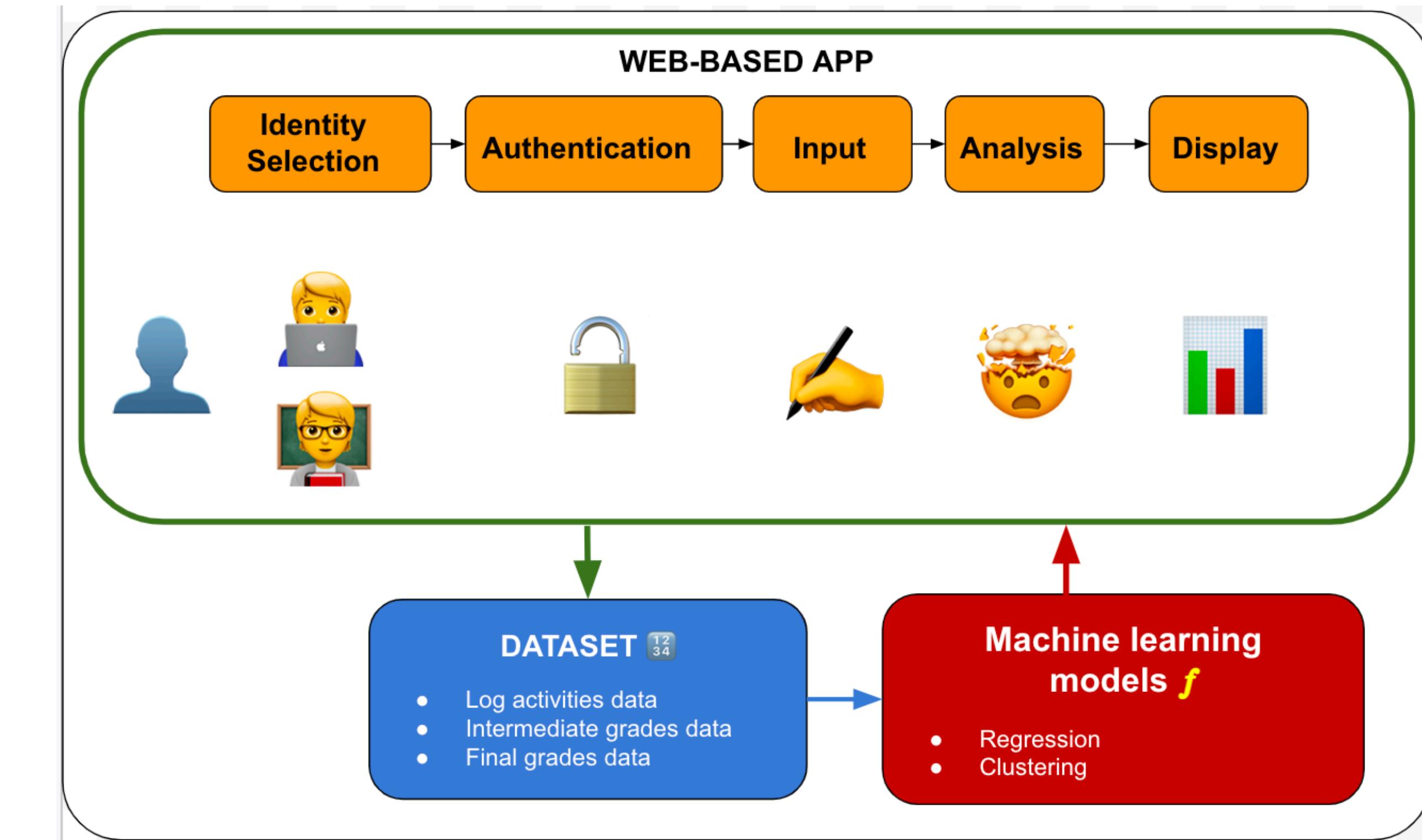
- It includes the log activities, such as idle time and mouse clicks, of 115 engineering students across 6 sessions.
- It also includes their session grades and final exam grades.

# Schematics

Final product: **Web-based App**

## 3 main components:

1. Machine Learning
2. Visualizations
3. Web Development



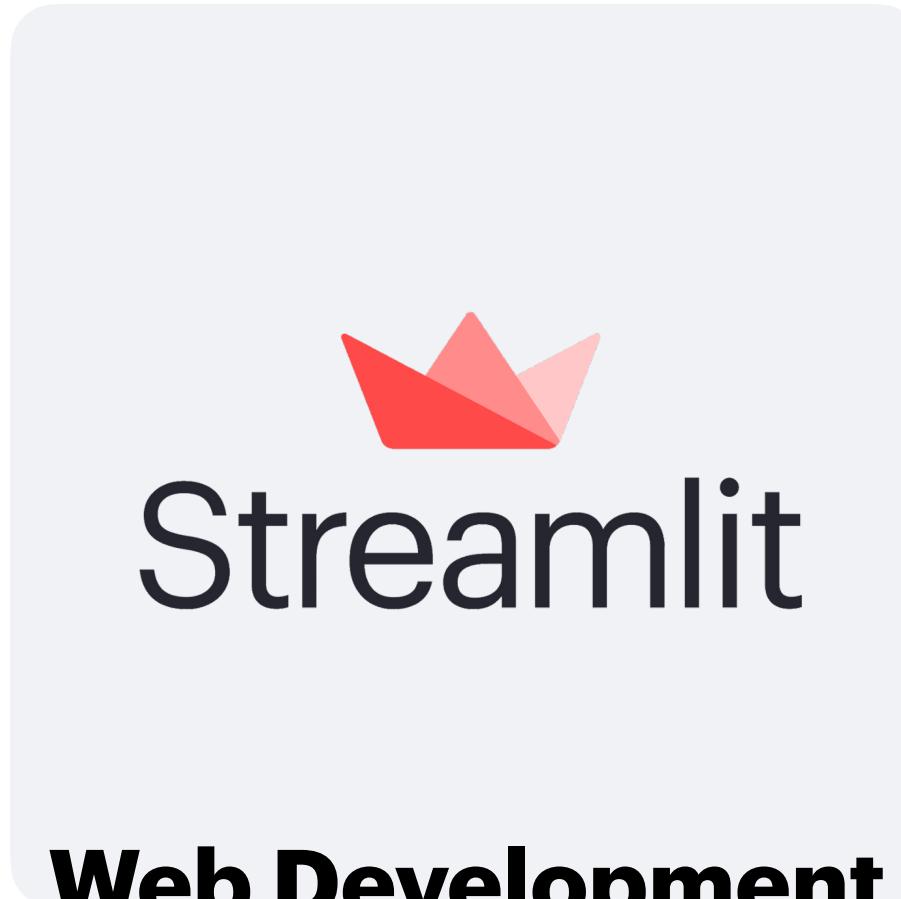
# Technologies Employed



**Machine Learning**



**Visualizations**



**Web Development**

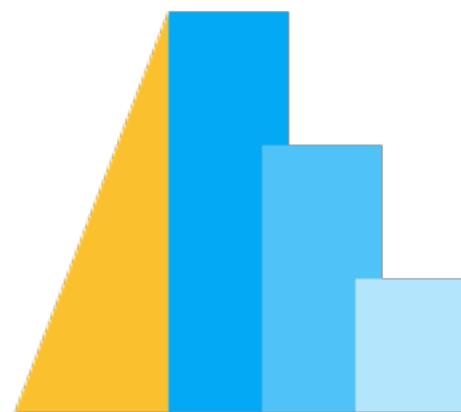


**Virtual Environment**

# Reasons for Technologies Selected



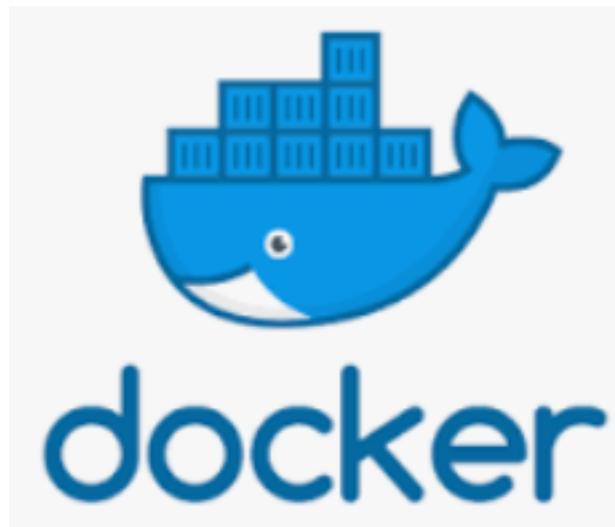
- Sufficient to achieve our goals
- We are familiar with this library
- Popular; solutions can be easily found online



- Works well with streamlit
- Easy to format altair graphs and add interactive elements to the graphs
- Minimal amount of coding



- User-friendly to people who have minimal experience in web development
- Contains built-in interactive widgets for visualizations
- Machine learning models can be embedded into the website



- Creates a virtual container compiling for both Windows and IOS system

# Team Work



## Strategies

We have three **subgroups** that can work independently.

Using channels on Slack to communicate

## Challenges

Not familiar with **Github functions** such as git branch

Hard to come up with **better solutions** for current problems

**Virtual environment:** although we implement docker, the runtime is not very ideal.

## Lessons Learned

We should **consult experts** on a specific tool/issue before implementing tools/solutions right away

- Spent too much time in exploring alternative tools
- We didn't know about pickle until we asked David

Using **test-driven development** next time

**Streamlit** has its limitations. (Buttons and multiple pages)

## Future Work

Deployment Strategy

# Project Demo

The screenshot shows a Streamlit application running locally at `localhost:8501`. The interface includes a top navigation bar with a back button, forward button, refresh button, and a Streamlit logo. A sidebar on the left contains a "Menu" section with a dropdown set to "Home" and a checkbox labeled "Delete UserDB". The main content area features a large, stylized illustration of a laptop displaying a checklist with items 1 through 8. To the right of the laptop, there are three small figures: a person in a graduation cap, a person in a yellow shirt, and a person in a blue dress. Below the illustration, the text "Welcome! Instructors and Students!" is displayed in bold. A descriptive paragraph follows, stating: "This website aims to provide visualizations and predictions based on our machine learning model to help you make sense of log data representing your online learning behaviors." It also encourages users to visit the [GitHub Repo](#) for suggestions. The final section, "Services Provided:", lists two main services: "Behavioral Analysis" and "Grades".

This website aims to provide visualizations and predictions based on our machine learning model to help you make sense of log data representing your online learning behaviors.

If you have any suggestions, please visit our [GitHub Repo](#) and raise a new issue!

**Services Provided:**

1. **Behavioral Analysis:** Showing the distribution of log activities across different types of activities for each session.
  1. Which activity you engaged with the most
  2. Which session you spent most time on
2. **Grades:** Showing the distribution of grades in one session, and the changes of session grades across 6 sessions. You'll know
  1. For each session, how you performed compared to the whole class