

Canvas LTI Student Climate Dashboard Mark II

Team Number: sdmay23-42

Team Members:

Joshua Harvey – Team Manager & Resonance Scoring

Colin Hasbrook – Canvas API Wrapper & Sentiment Analysis

Elias Simpson – Kubernetes, Docker, Server, Infrastructure

Howard Chi – UI

Hailee Leonard – UI

Jonathan Giblin – Okta Authentication, Infrastructure, CI/CD

Client: Henry Duwe

Advisor: Nick Fila

Date: 5/4/2023

Project Overview



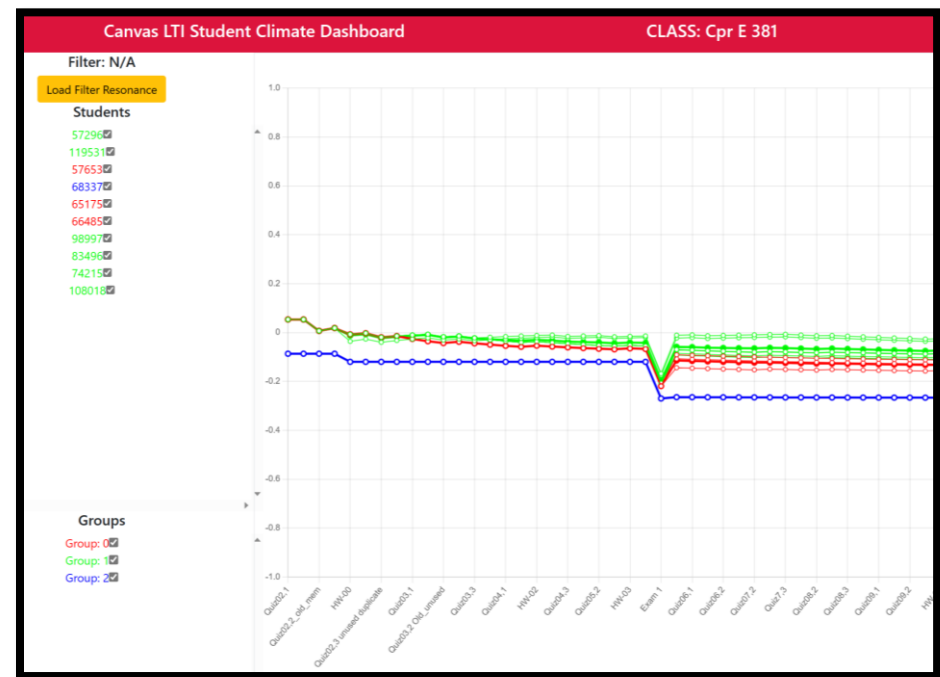
Problem Statement | Solution

Problem Statement:

- Instructors and students lack tools that analyze student and course data to provide users with a better understanding of student experiences throughout the duration of a course

Solution:

- Improve Journey Map Algorithm
- UI Efficiency
- New Student Facing Visualization



Purpose

- **Instructors:**
 - Understand students' experiences
 - Empathizing with students
 - Improving student interactions
- **Students:**
 - Reflect on class performance
 - Basis for instructor communication and personal development
- Automate the process to be effectively beneficial



Project Implementation



Architecture

Application Components

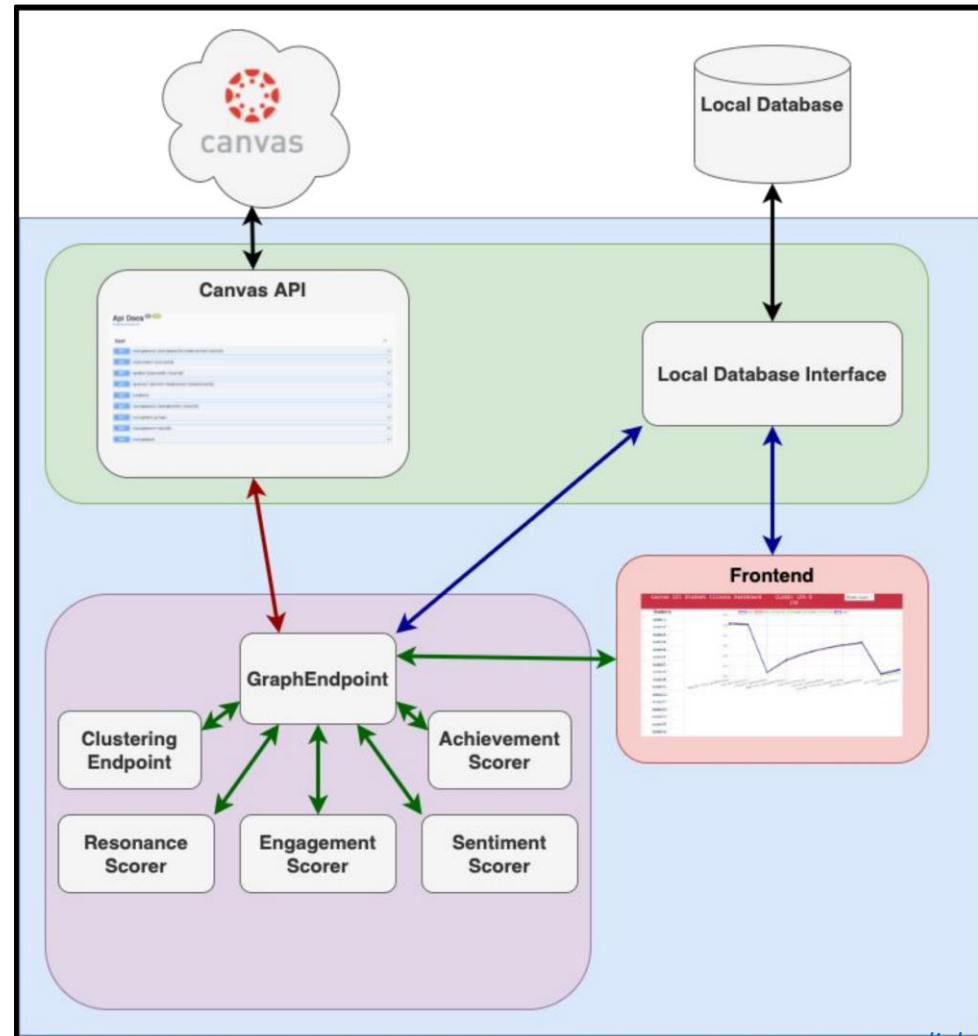
- Canvas API Wrapper (green-left)
- Data Analysis Pipeline (purple)
- Data Storage (green-right)
- Frontend UI (red)

Implementation

- Microservice-Based Architecture
- Containerized Modules
- Deployed in Kubernetes Cluster on ETG VM

Communication (arrows)

- Protobufs (green)
- JSON (red)
- TCP/IP (blue)



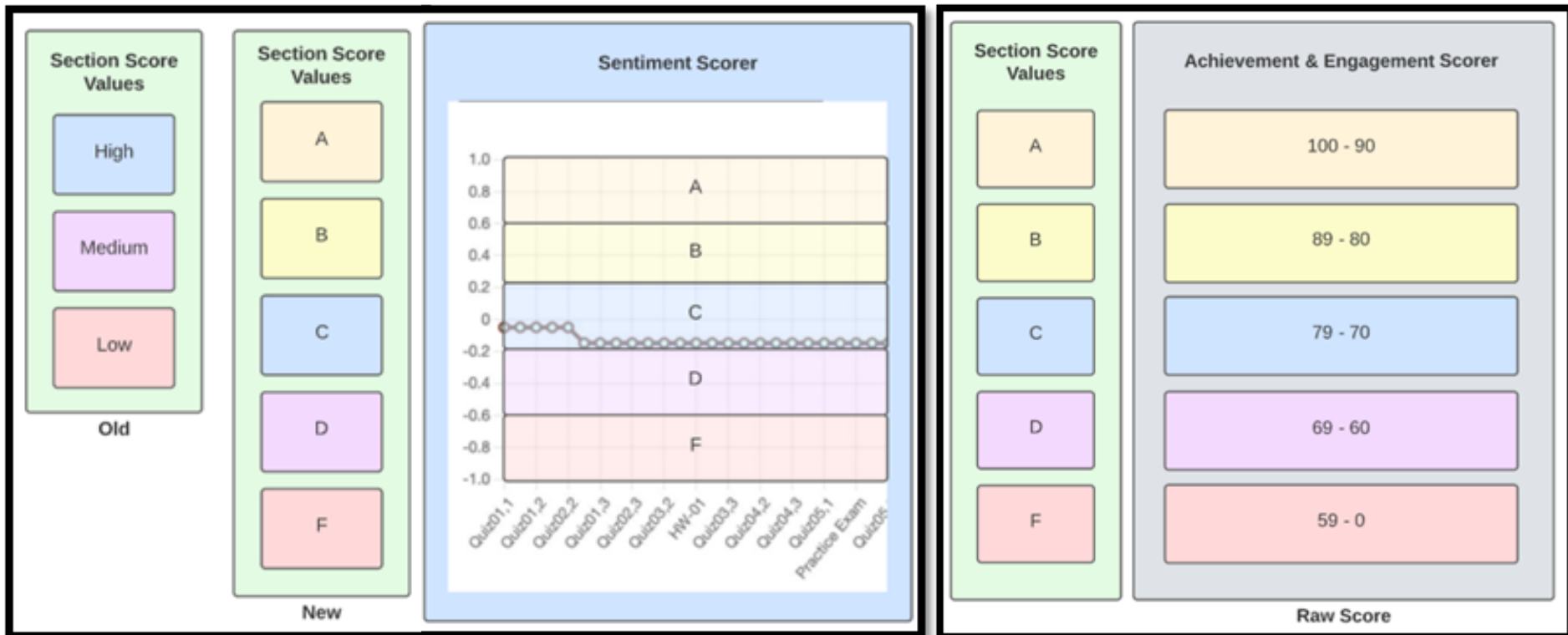
Canvas API Wrapper

1. Wrapper that utilized the Canvas API
2. Uses Canvas Token to allow data collection
3. Create objects/endpoints to retrieve data
4. Does not store data for security and FERPA purposes



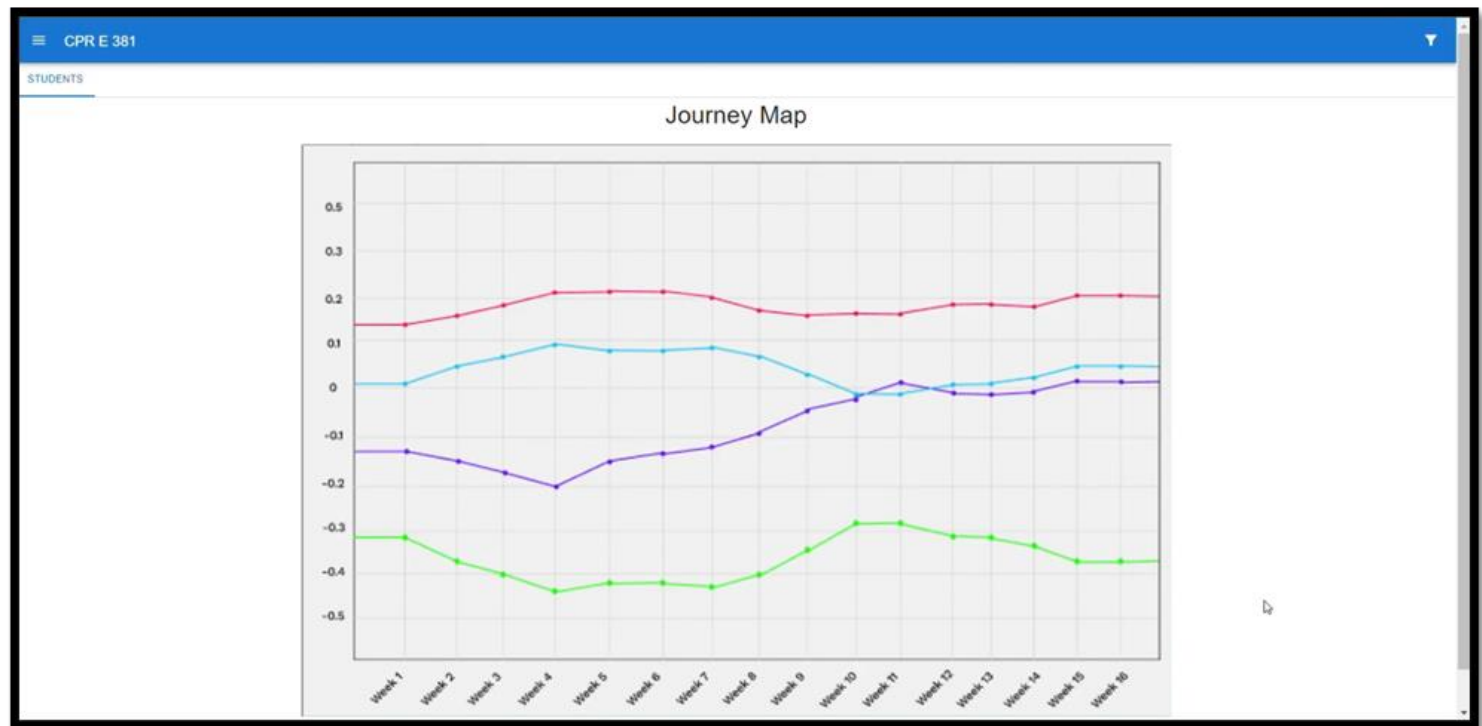
Resonance Scoring

- New Section Score Model



Frontend

1. Bigger Journey Map
2. Immersive UI
3. Modernize libraries and frameworks used



Kubernetes, Docker

1. Kubernetes
 - a. Deprecated packages
 - b. Server requirements (Protoc, grpc-web)
 - c. Kontainer-runtime
2. Docker
 - a. Missing Dockerfile
 - b. Missing statements in script
 - c. Dev infrastructure mixed with prod
3. Runtime (tokens, IDs, SQL access)

```
vm-user@sdmay23-42:~$ sudo kubectl get deployment --all-namespaces
NAMESPACE          NAME                READY   UP-TO-DATE   AVAILABLE   AGE
achievement-scorer  achievement-scorer  1/1     1             1           25d
canvas-api          canvas-api          1/1     1             1           25d
clustering-endpoint clustering-endpoint  1/1     1             1           25d
engagement-scorer   engagement-scorer   1/1     1             1           25d
frontend            frontend            1/1     1             1           25d
graph-endpoint-envoy graph-endpoint-envoy 3/3     3             3           25d
graph-endpoint      graph-endpoint      3/3     3             3           25d
kube-system         coredns             2/2     2             2           25d
resonance-scorer    resonance-scorer    1/1     1             1           25d
sentiment-scorer    sentiment-scorer    1/1     1             1           25d
sql-connection      sql-connection      1/1     1             1           25d
```

Filter: N/A

Load Filter Resonance

Students

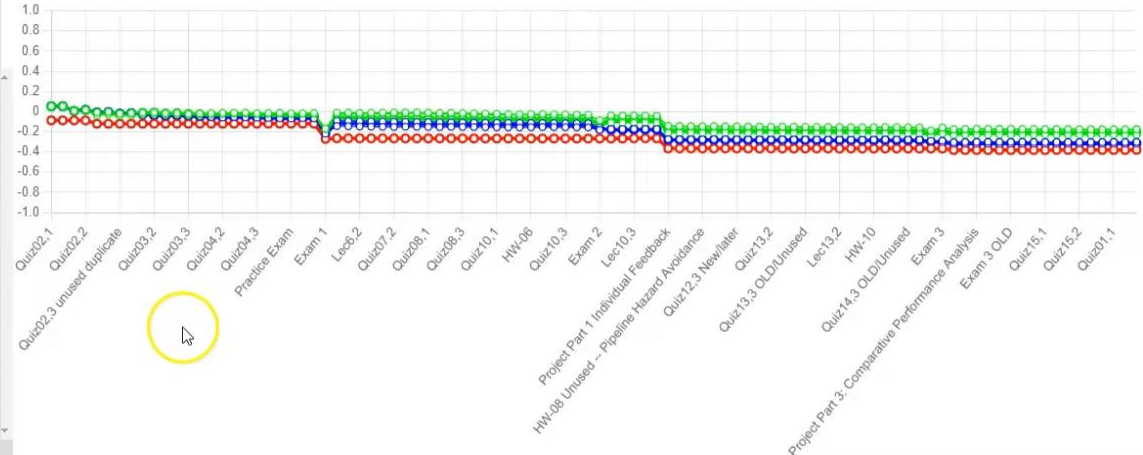
- 57296
- 119531
- 57653
- 68337
- 65175
- 66485
- 98997
- 83496
- 74215
- 108018

Groups

- Group: 0
- Group: 1
- Group: 2



Student Resonance



Graph Manipulation

Recalculate Student Resonance

Assignment Weights

Assignments	<input type="text" value="5"/>
Sentiment	<input type="text" value="0"/>
Project	<input type="text" value="30"/>
Labs	<input type="text" value=""/>

Resonance Weights

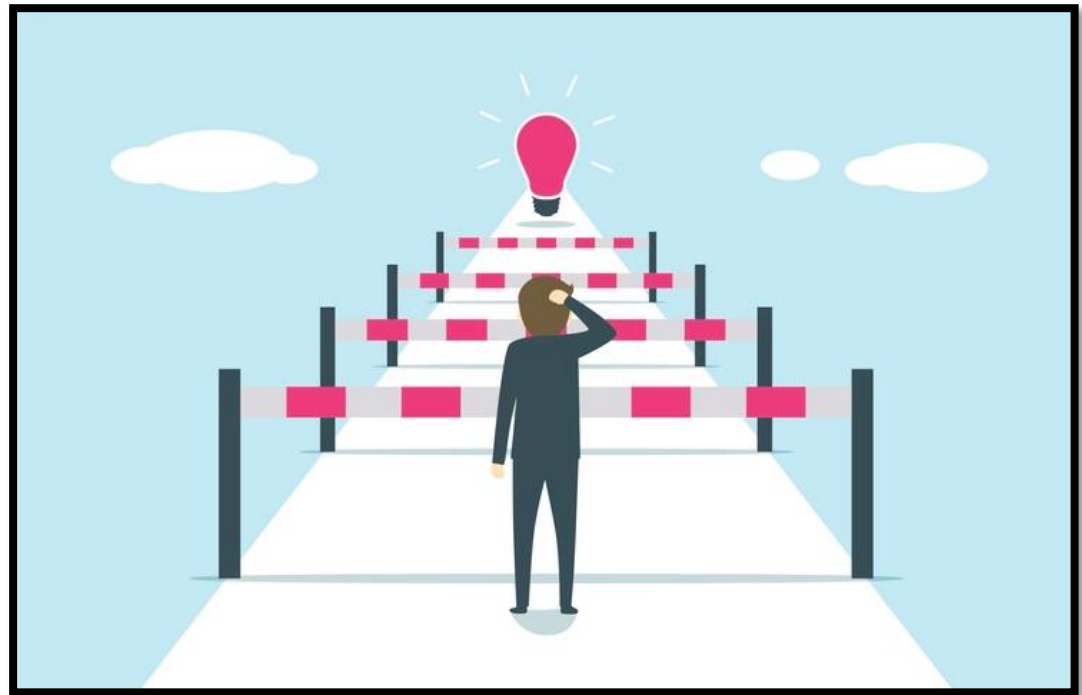
Achievement	<input type="text" value="33.3"/>
Sentiment	<input type="text" value="33.3"/>
Engagement	<input type="text" value="33.3"/>

Key Contributions

- Joshua Harvey – Course Management & Resonance Scoring
- Colin Hasbrook – Canvas API Wrapper and Sentiment Analysis
- Elias Simpson – Kubernetes, Docker, Server, Infrastructure
- Howard Chi – UI changes
- Hailee Leonard – UI changes
- Jonathan Giblin – Okta Authentication, Infrastructure, CI/CD

Challenges

- Project Inheritance
- Infrastructure (technologies)
- Retrieving data from Canvas
- Okta Integration
- UI connection
- Team Cohesion



Future Work

- FERPA & ISU Certification
- Additional Resonance Features
- Further UI Improvements
- Backend Stability & Operation
- Student Facing Visualization

Conclusion

- Strengthened Project State
- Valuable Experience
- Improvements:
 - Working Application
 - Infrastructure
 - Canvas API
 - Resonance Scoring
 - UI Improvements

A photograph of a university campus with a red overlay. The image shows a large building with a dome on the left, a row of trees in the middle ground, and a large building with a portico on the right. The text "Questions?" is centered in white.

Questions?