

Automating Database Question Generation and Marking with PrairieLearn

Minimum Viable Product

Nishant Srinivasan: Project Manager

Matthew Obirek: Client Liaison

Skyler Alderson: Technical Lead

Andrei Zipis: Integration Lead

Project Overview

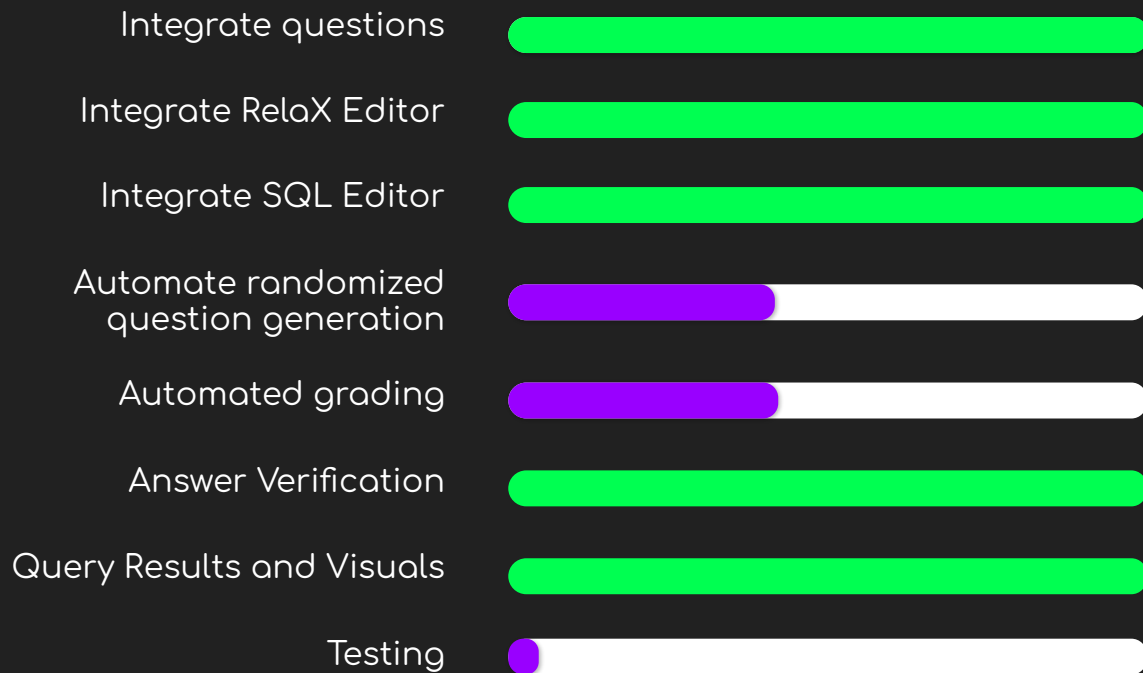
The Problem:

Students in COSC 304 are reliant on using multiple different platforms for their coursework - including time-sensitive evaluations such as midterms and final examinations. Tools include:

- Canvas
- PrairieLearn
- RelaX
- GitHub
- Squirrel DBMS

The Solution:

- Integrate questions from existing labs (1-3) for COSC 304 into PrairieLearn
- Integrate the RelaX editor and all its features and functionality
- Integrate an SQL editor with SQL formatting functionality
- Automate randomized question generation
- Automate the grading process - (partial marking is a stretch goal)
- Implement a feature that allows students to verify their answers on PrairieLearn



** MVP is complete*

Integrating Editors

RelaX

- Tree rendering
 - Outpt table
 - Execution
 - Error rendering
 - Rel.Alg. Buttons
-
- + *“Click to add” functionality*
 - + *DB Schema rendering*
 - + *Hovering over operations in editor for their names*

SQL

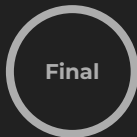
- Outpt table
 - Execution
 - Error rendering
 - SQL Code Formatting and color-coding
-
- + *“Click to add” functionality*
 - + *DB Schema rendering*

+ *Not a requirement but added for enhancement*



String-Matching

Cross-reference submitted answer with pre-defined solution and grade by similarity + matches



Output Matching

Compare output tables generated by student's response with the expected output to allow for multiple approaches



Beyond Matching

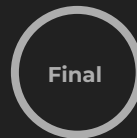
Partial grading based on multiple factors

Autograding



Initializing Question Generation Process

Separate lab questions from questions in need of auto generation and structure everything accordingly



Extending

Making all the appropriate questions autogeneratable by varying difficulties

Autogeneration

Unit Testing

~5% Complete

SQL Autogenerator - 21.4%

SQL Autograder - 0%

RelaX Autogenerator - 0%

RelaX Autograder - 0%

* Certain files are untestable due to the codebase setup , hence these are what we are able to test as of right now

Integration Testing

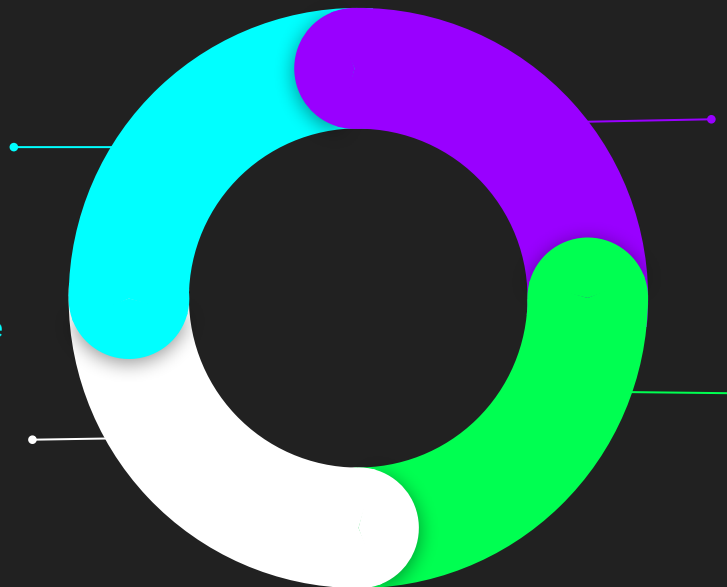
0% - Have not started yet

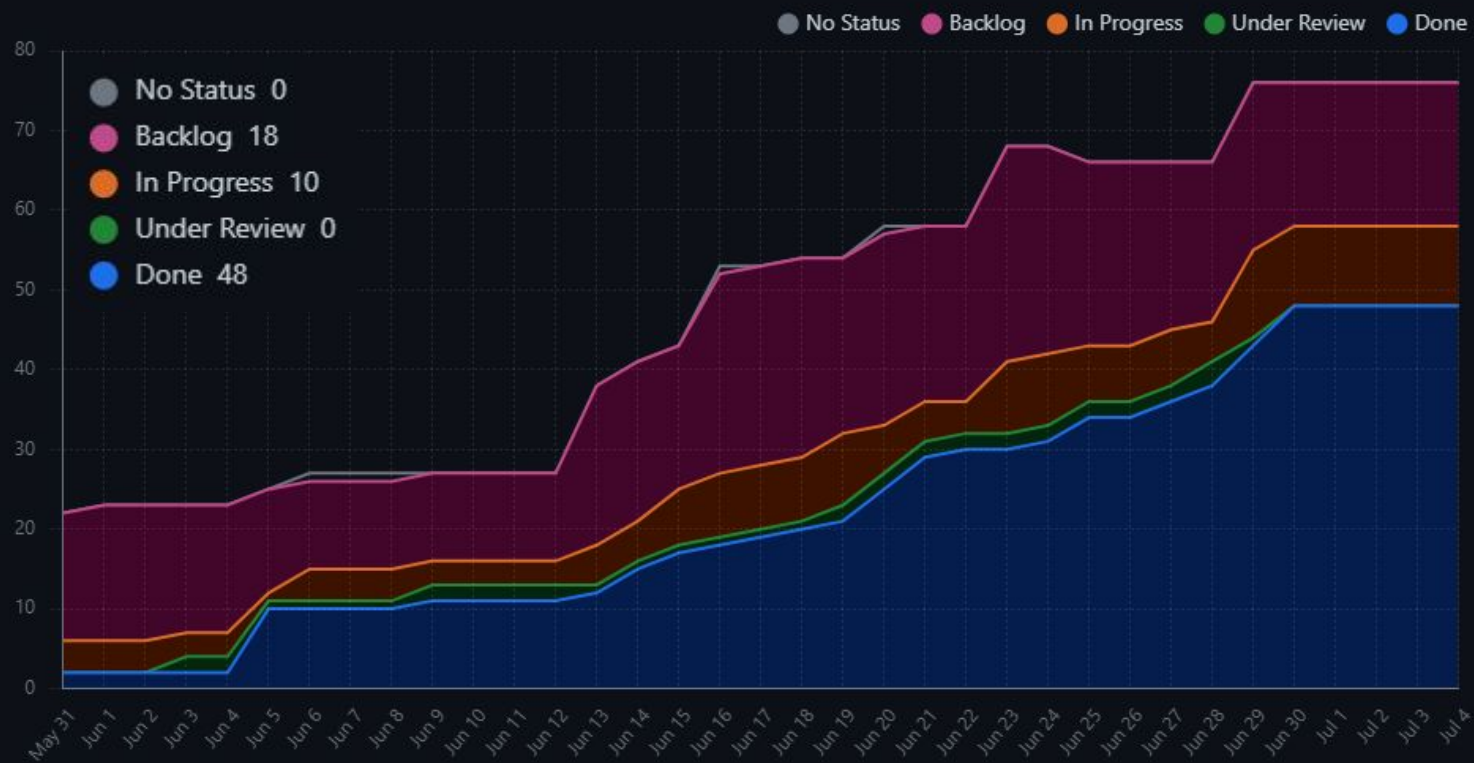
Performance Testing

0% - Have not started yet

UI Testing

* Facing **issues** with running them on **Drone** as of right now , need to find a work-around before proceeding further

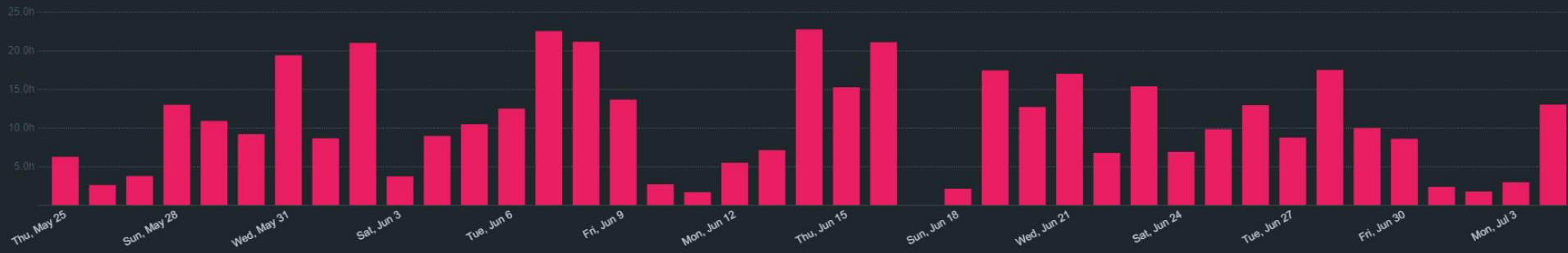
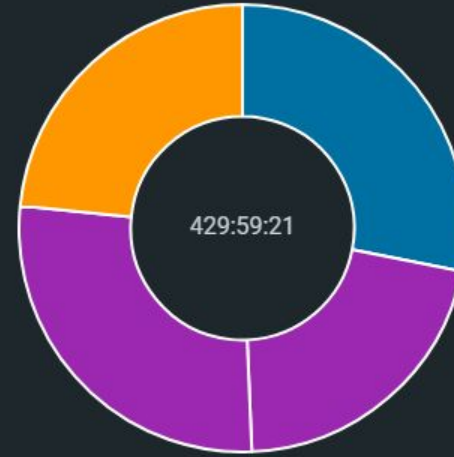




Hours (May 25th - July 4th)

Nishant - 117:14:51
Matthew - 91:21:16
Skyler - 100:37:18
Andrei - 120:45:56

Total - 429:59:21



DEMO