

SCORE

Student Code Online Review and Evaluation

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Advisor/Client: Dr. Mohan

Goals and Motivations

Goals

- Develop a more robust submission platform
 - Automatic testing
 - Test case specific feedback
- Streamline the submission process
 - OAuth student authentication
 - No control code
 - Canvas integration
- Develop skills in full-stack development

Motivations

- Student perspective
 - Dislike the use of control codes
 - Seperate from Canvas
 - Lack of immediate feedback
- Professor perspective
 - Difficulty with Canvas submission file names
 - Kattis doesn't support custom problems

Approach (Features)

Auto Testing

- Student
 - Code is automatically tested against hidden test cases
- Professor
 - Configures the auto-testing environment
 - Supplies sample (visible) and hidden test cases
 - View scores for student submissions

Immediate Feedback

- Student
 - View the number of test cases passed/failed
 - View case specific feedback from the professor
 - View all previous submissions scores
- Professor
 - Attach helpful feedback to specific test cases
 - Control how much feedback a student receives

Grading Portal

- Professor
 - Modify scores to match grading criteria
 - Have grades automatically uploaded to canvas
 - Export grades as a .CSV file

MOSS Integration

- Professor
 - View a student submissions MOSS score
 - Set acceptable limits to the MOSS score

User Authentication

- Access the platform through OAuth
 - Officially decided to move from TRACKS to OAuth
 - We felt OAuth would be more streamlined
- Students will not have to register and maintain a control code

Web-App / Shell Client

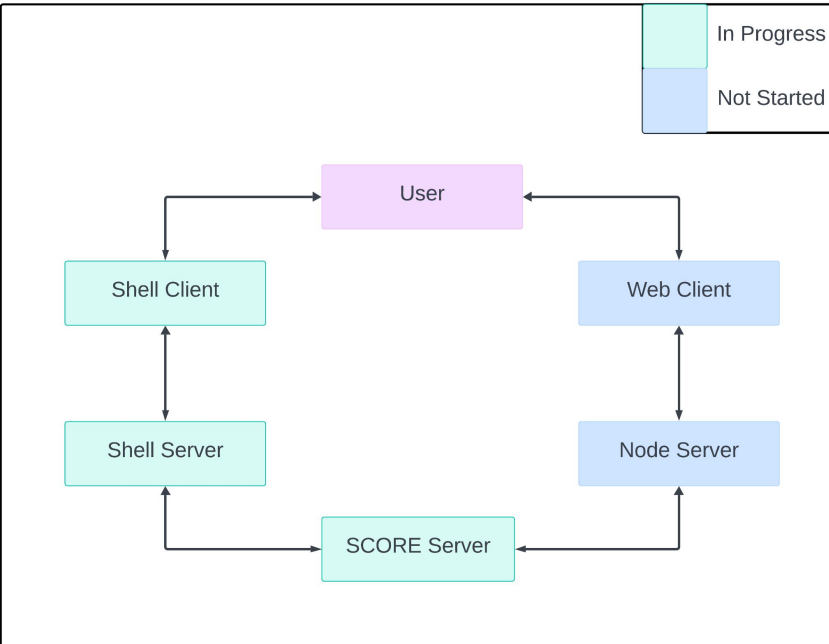
- Student
 - Upload C, C++, Java, or Python files
 - View assignment grades
 - View auto test scores and feedback
- Professor
 - Create new assignments, test cases, and feedback
 - View student submissions with auto test scores
 - View a submission's MOSS score

Novel Features

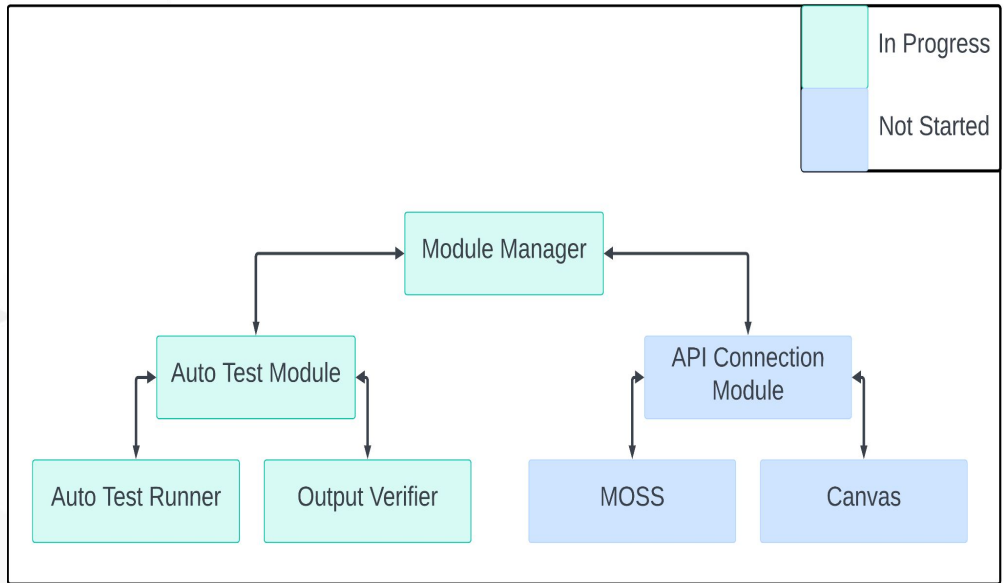
- Automatic MOSS Calculation
 - Automatically calculates the MOSS similarity score for each submission to an assignment
- Assignment creation
 - Kattis does not allow the professor to create new assignments
- Test case feedback
 - None of the platforms allow professors to attach feedback to test cases

Design

System Architecture



SCORE Server



Progress summary

Module/Feature	Completion	To do
Auto testing	80%	Auto test caller and output checker
Immediate feedback	50%	Professor feedback
Grading portal	0%	Not started
API integration	0%	Not started
User Authentication	0%	Not started
Shell Client	90%	Man page
Web app	0%	Not started
SCORE server	80%	Integrate components

Potential Tools

- MERN - MongoDB, Express, React, Node
- API
 - Canvas
 - MOSS
 - OAuth
- Python
- Rust
- Docker
- SFTP

Technical Challenges

- Communication between server component without concurrent modifications
- Atomicity of server actions
- Student user authentication using OAuth

Evaluation

- Load testing
 - Ensure we can handle enough concurrent users
 - Number of concurrent users without crashing
- Test accuracy
 - Ensure the auto test module accurately scores the submissions
 - The percent of accurately scored submissions
- User demo
 - In class demo with Dr. Mohan to ensure usability
 - Survey to rank the key features usability out of 10

Milestone 4

- Finish implementing auto testing and feedback
- Implement, test, and demo front end web app
- Implement, test, and demo user authentication
- Integrate server components

Milestone 4 Task Matrix

Task	Tommy	Logan	Michael	Charlie
Auto testing & feedback	50%	50%	0%	0%
Web app front end	0%	50%	25%	25%
User Authentication	40%	0%	30%	30%
Integrate server components	0%	0%	50%	50%

Milestone 5

- Implement, test, and demo web app backend
- Implement, test, and demo grading portal
- Conduct evaluation and analyze results
- Create poster for senior design showcase

Milestone 6

- Implement, test, and demo Canvas integration
- Implement, test, and demo MOSS integration
- Test/demo the entire system
- Create user/developer manual
- Create demo video