ELTE EÖTVÖS LORÁND TUDOMÁNYEGYETEM

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Software Evaluation and Analysis Platform with Script Execution Engine

Supervisor

Viktória Zsók, Ph.D

Assistant Lecturer

Author

Zayar Htet

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Agenda

SEAP

1. Motivation and Problem Statement
2. Software Solution and Architecture
3. Tech Stacks and User Role in SEAP
4. Software Evaluation and Analysis Platform (SEAP)
5. Script Execution Engine (SEE)
6. Unit Testing
7. Future Work
8. Conclusion

1. Motivation and Problem Statement

SEAP

Reduce human effort in correcting assignments

Application of software engineering principles at the software level

Automation

2. Software Solution and Architecture

SEAP

the assignment system called the Software Evaluation and Analysis Platform (SEAP)

SEAP

the execution system called Script Execution Engine (SEE) with the plugin development feature

SEE

the standard library and the template for the SEE plugins

SEELibrary

SEAP Rest API

- is the main server of the SEAP
- can be integrated into WebUI, Desktop and Mobile app

SEE is the standalone implementation module

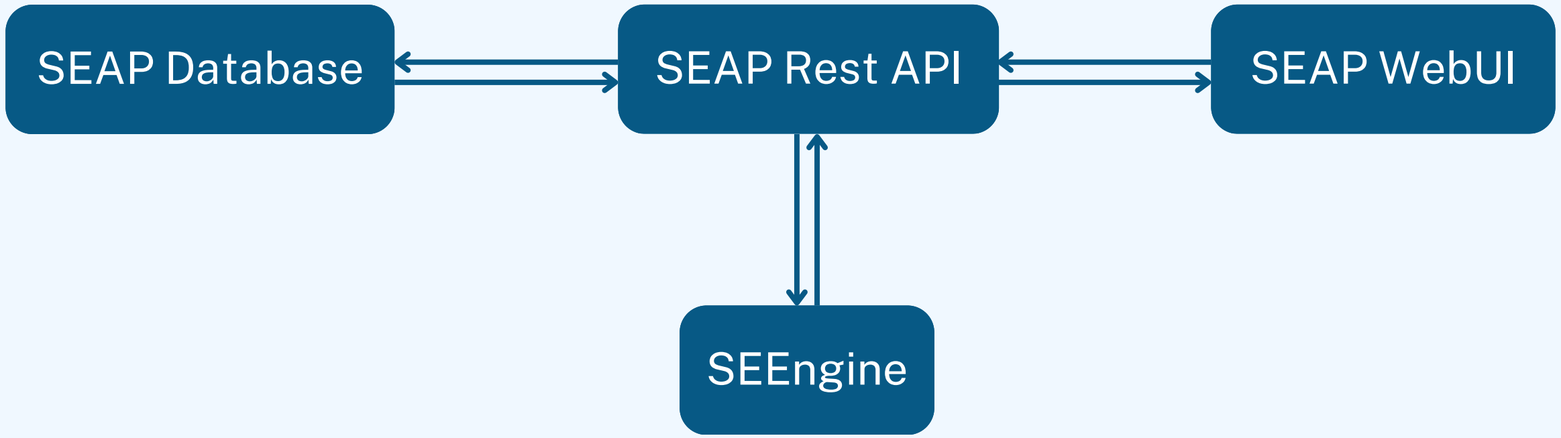

Fig: Micoservice architecture for SEAP

3. Tech Stacks and User Role in SEAP

SEAP

Go for the Rest API server and the SEE

Angular for the WebUI

MySQL for the database

User Role in SEAP

- Each user account can have either a Tutor or a Tutee role.
- Upon registration, only the tutee role will be assigned.
- The admin account can grant a tutor role.
- A tutor account can create the family.
- A Tutee account can do nothing but just get assigned to the family.

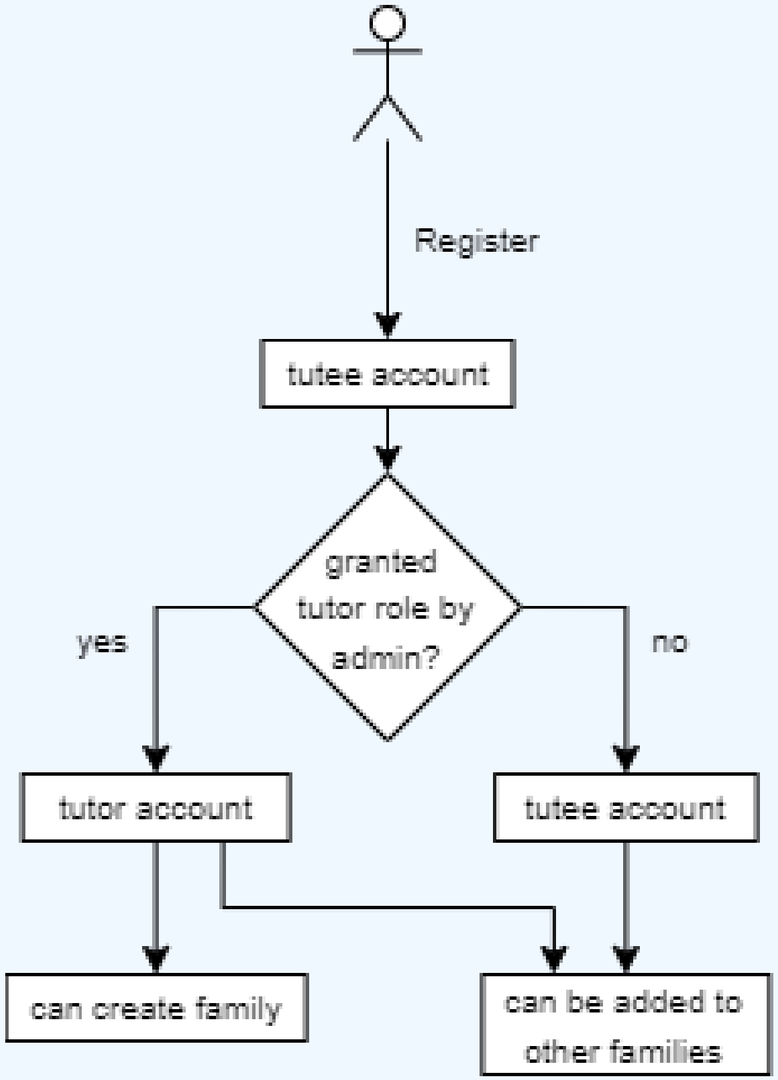

Fig: User Account Role Diagram

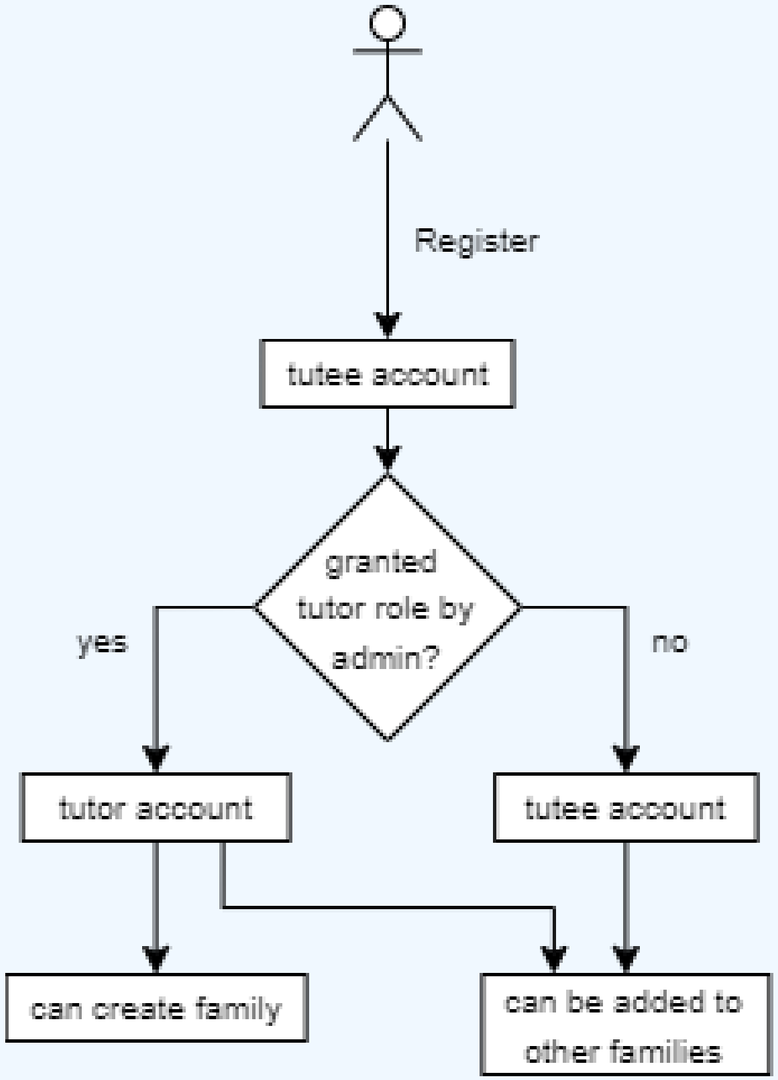

Fig: User Account Role Diagram

4. Software Evaluation and Analysis Platform (SEAP)

SEAP

The Rest API server and WebUI are implemented with a layered architecture, MVC, Model View Controller.

Features of the SEAP

- create families
- manage members
- schedule duty
- choose a plugin for the duty
- see the members’ submission
- review the report
- grade the submission

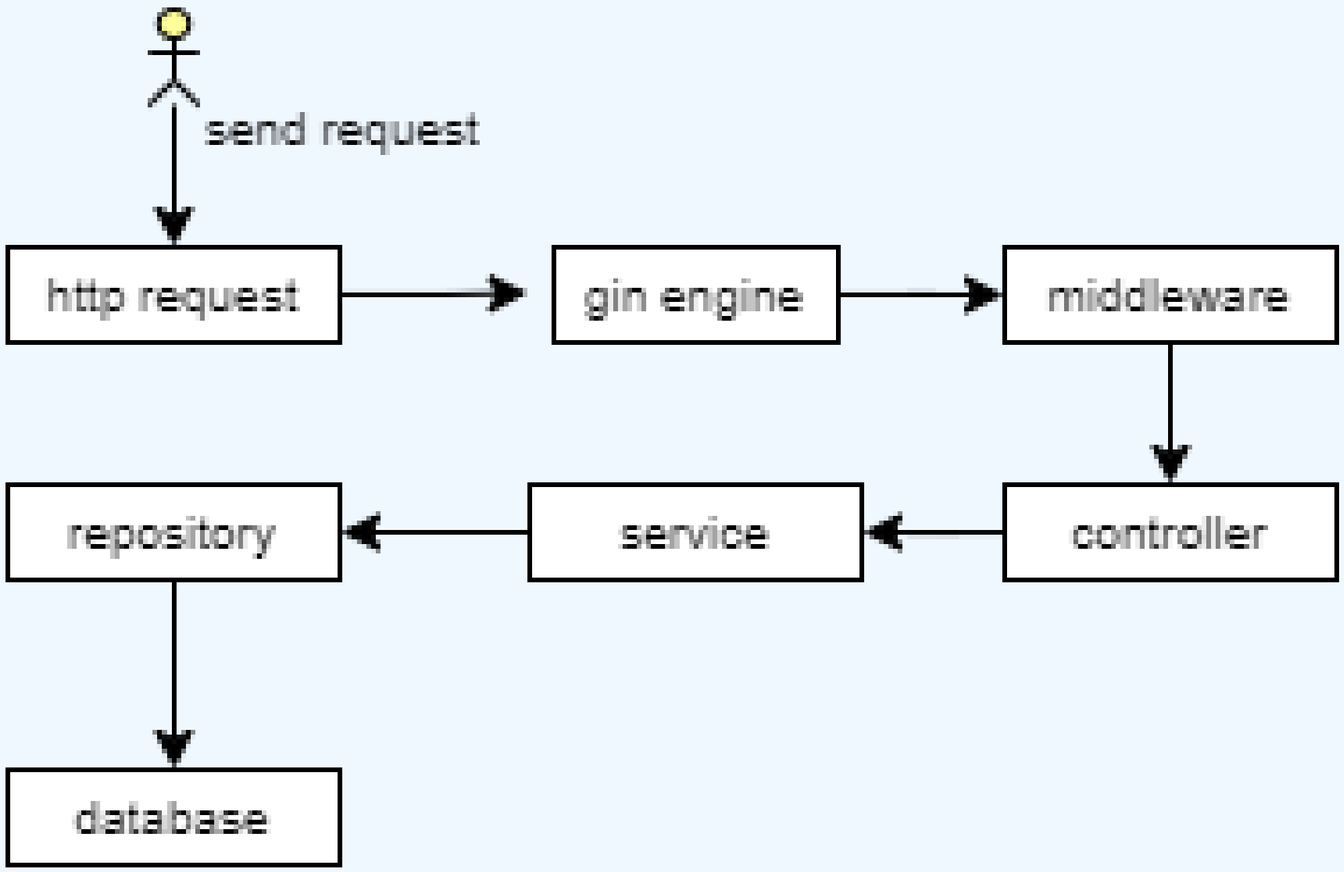

Fig: SEAP Rest API Workflow

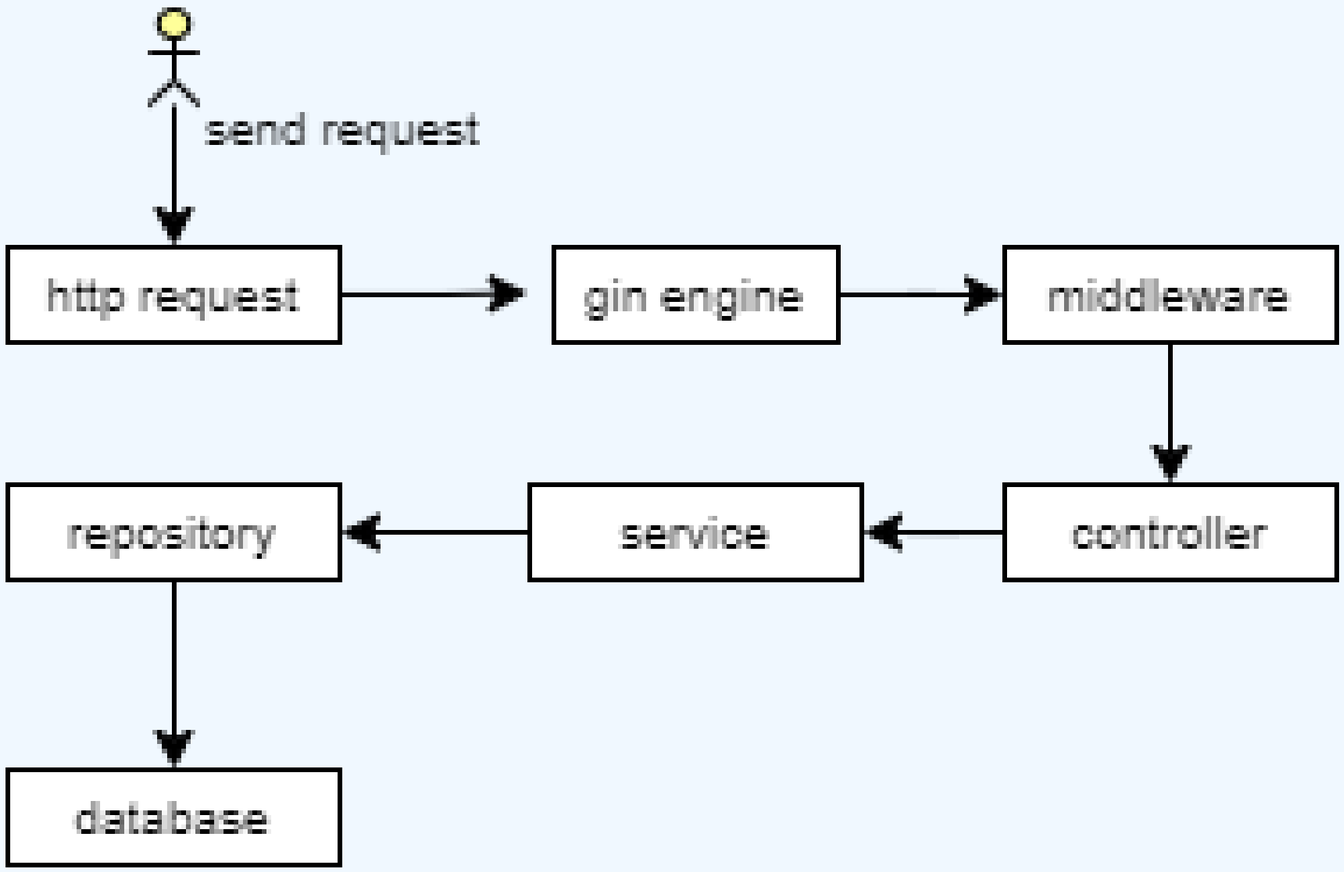

Fig: SEAP Rest API Workflow

5. Script Execution Engine (SEE)

SEAP

- The selected plugin is executed concurrently for each submission.
- The plugin execution generates the report for each submission and shown in the WebUI.
- Plugin development is restricted with the plugin template and SEE Plugin Standard Library.

6. Unit Testing

SEAP

- Test package for each layer of SEAP Rest API server
- Mock implementation for each layer
- Mocking the HTTP requests for the controller layer testing
- Dummy data for the repository layer testing

7. Future Work

SEAP

The authentication mechanism for the SEAP is to be replaced with Rotational JWT Auth

The execution of the submitted file must be in the sandbox container with the application-level kernel by using Docker and GVisor.

The SEE plugin standard library API is to be extended to create and manipulate the container.

8. Conclusion

SEAP

- We cannot create software that covers every possible scenario.
- However, we can create a centralised framework with the extensibility feature.
- Collect the similarities among the possible scenarios and use case stories.
- Collect the differences between different scenarios and make the software customizable.
- Remove any duplication and set up the centralised independent reusable components.
- Open for extension closed for modification principles.

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Thank you very much for your attention!

Thank you, ELTE and Professors!

Zayar Htet, Computer Science BSc