Dynamic Computational Graph Framework

An Advanced Programming Project –

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Goals

- **Develop a web application with an intuitive and visually pleasing UI that enables interactivity in ease.**
- **Gain experience in advanced programming methods and real-world development practices.**
- **Learn advanced programming methods and best practices.**
- **Experience real-world development, concepts, methodology and difficulties.**

Technologies and Architecture

- **Creating project in layers to ensure modular and maintainable code:**
  - **HTTP Server as the controller, in MVC model.**
  - **Data: Interaction with the file system for configurations and exporting results.**
  - **HTML and JavaScript for client-side development – created last for good practice.**

Key Functionality

- **Load configurations and display computational graph.**
- **Post messages by topic and update the table accordingly.**
- **Move the graph, zoom in or out.**
- **Export data.**

Roadmap Features

- Host web application publicly.
- Host database in FireBase.
- Support log in authentication (also via FireBase).
- Drop-down and auto complete in “Topic Name“ field.
- Clicking on an agent node will highlight it (exists already) and will display the calculation being done.
- Implement an agent that can handle a complex formula and will break it down into smaller agents.
- Generate additional agent offering advanced functionality (not necessarily simple mathematical calculations).
- Implement advanced error handling protocol.

Summary

- Learned best practices in development like SOLID.
- Utilized data objects, files, streams, communication, and threads.
- Developed GUI to showcase our work.
- Learned architectures like MVC and MVVM.
- Learned web development using SOA and REST.
- Learned scalability and Android development in Kotlin.
- Used modular, maintainable and flexible code.


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