Computer Organization - Project I

MIPS Simulator in Java

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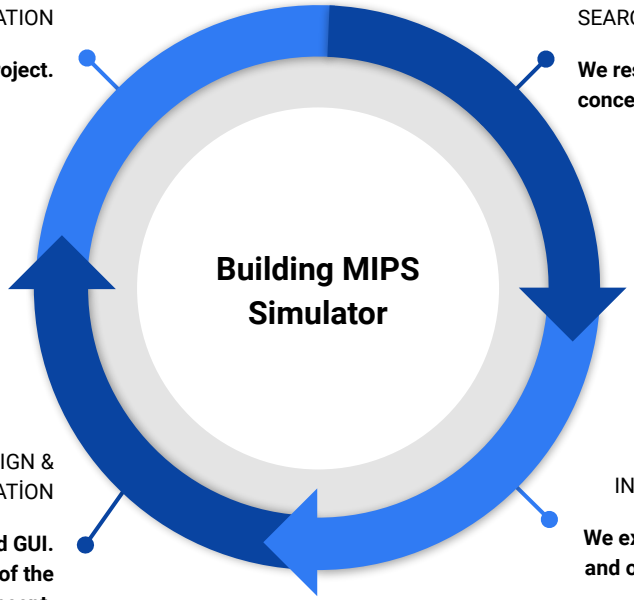
https://github.com/SevcanDogramaci/MIPS-Simulator/tree/devm

Project Phases



SEARCH & STUDY

We researched about main MIPS concepts and studied them.

INVESTIGATING EXAMPLE PROJECTS

We examined SPIM simulator functionalities and other MIPS simulator projects to utilize.

DESIGN & DISCUSSION ABOUT IMPLEMENTATİON

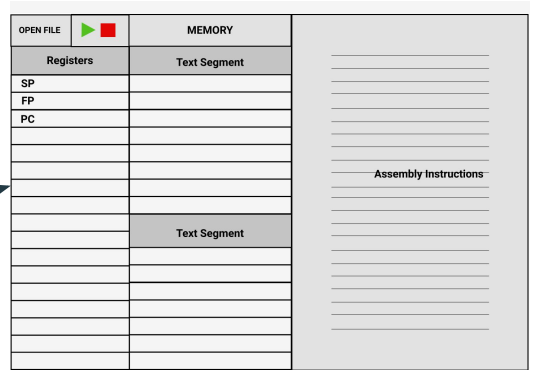
We designed GUI.
We formed main structure of the program by brainstorming each concept.

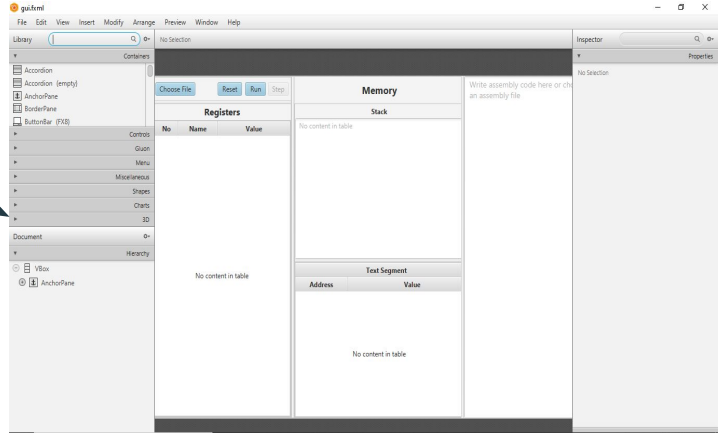
IMPLEMENTATION

We built and coded the project.

GUI Operations

- We made a prototype of program in **Figma**.
- We used **JavaFX software platform** to develop GUI.
- We utilized **Scene Builder Visual Layout Tool** integrated with JavaFX, in development.

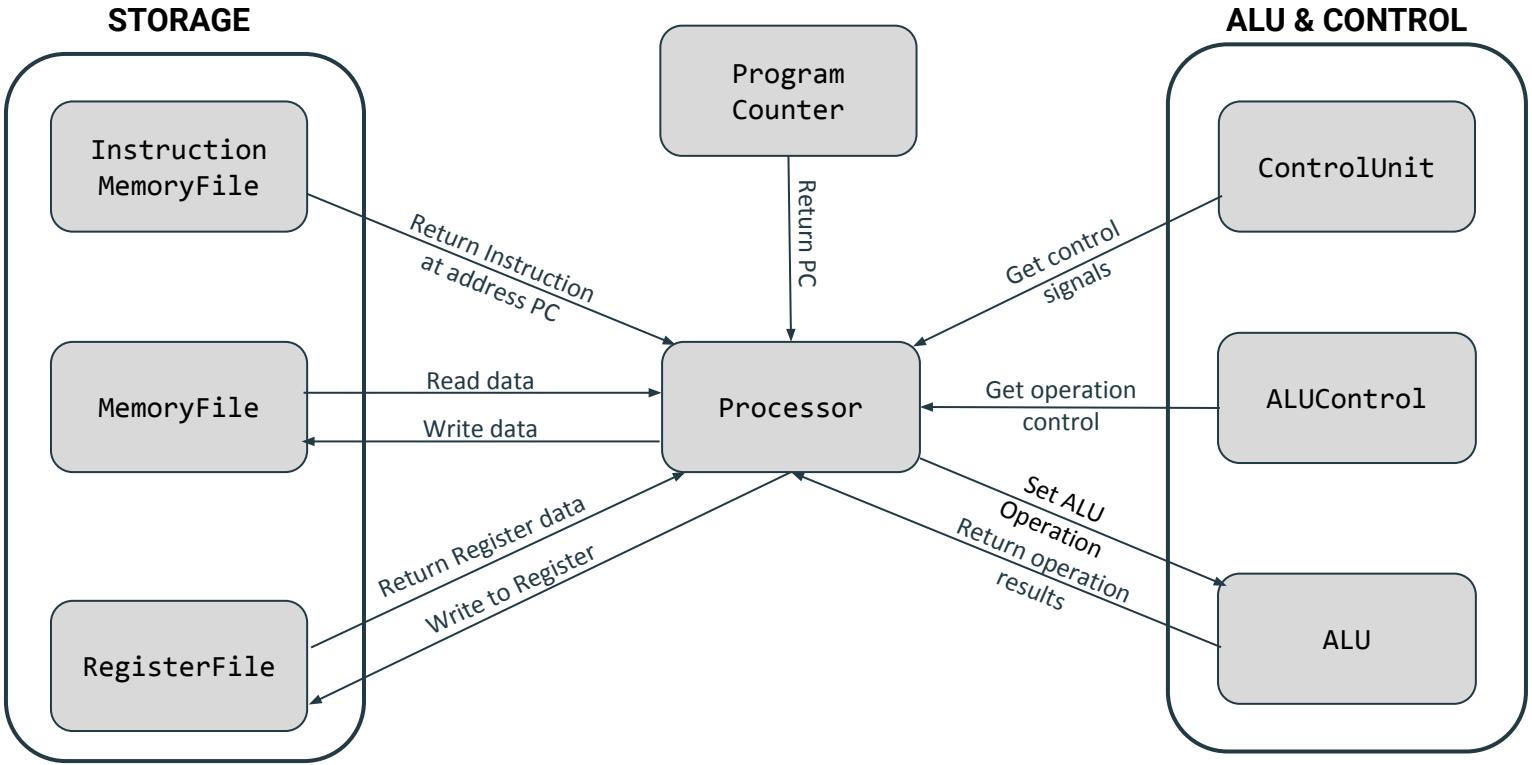


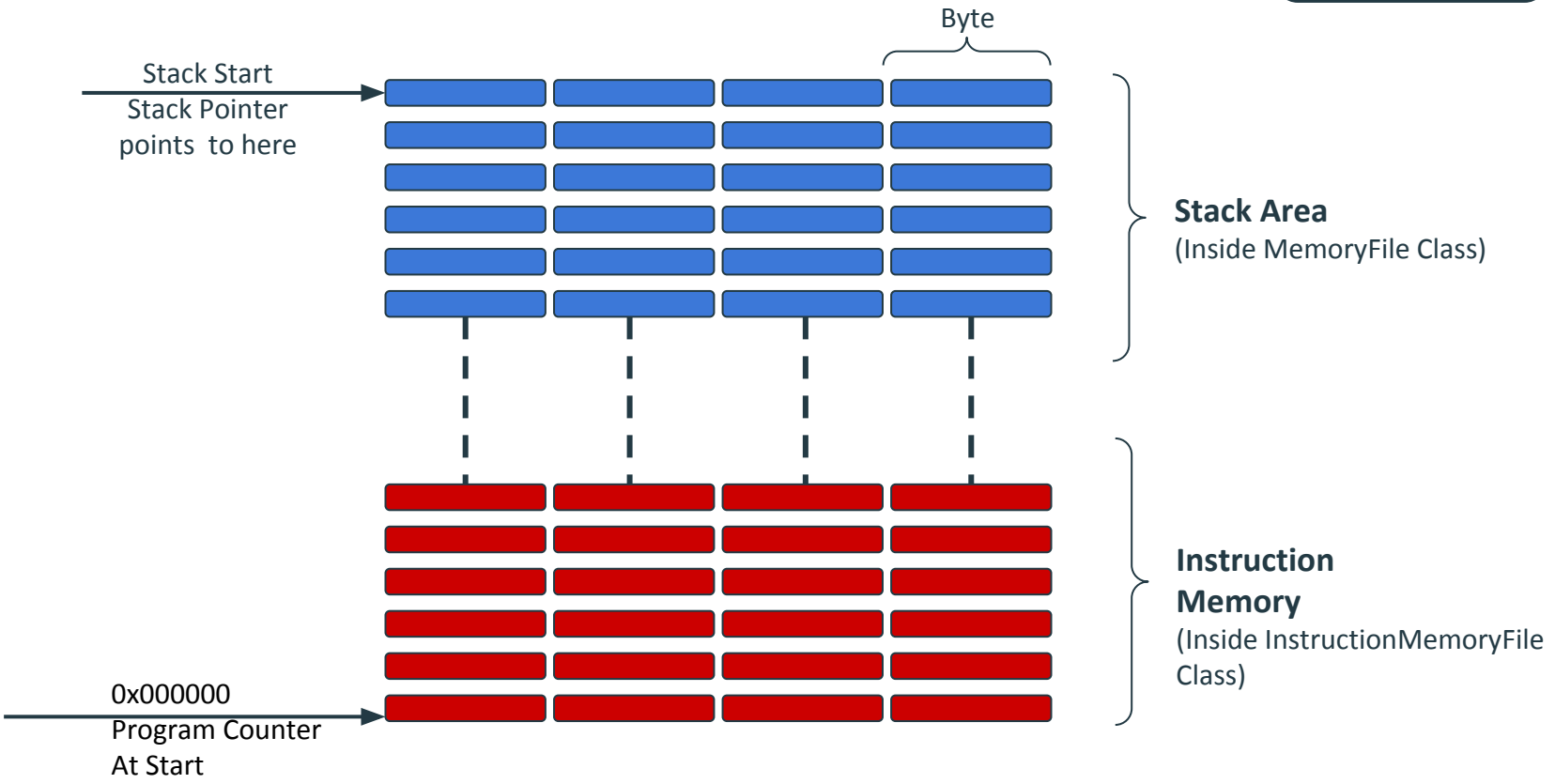


Classes

- `Main` — Entry point
- `Instruction`
- `ProgramCounter`
- `Register`
- `Controller` — Track GUI operations & program execution
- `RFormatInstruction`
- `ALU` — Performs arithmetic & logic operations
- `RegisterFile` — Keeps registers
- `Parser` — Parse assembly code
- `IFormatInstruction`
- `ALUControl` — Determine operation
- `MemoryFile` — Keeps stack data
- `Processor`
- `JFormatInstruction`
- `ControlUnit` — Manage control signals
- `InstructionMemoryFile` — Keeps instructions

General Flow Of Processor



Memory

We used Little Endian structure.