Software CPU

Team Members

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Repository

The complete source, documentation, schematics, example programs, assembler, emulator, and demo video are hosted at:

https://github.com/ganeshsjsu/softcpu

Download, Compile, and Run

Prerequisites: C++20 compiler (Homebrew `g++-15` or `clang++`), `make`.

Get the code:

```
git clone https://github.com/ganeshsjsu/softcpu.git
cd softcpu
```

Build:

```
make
```

Assemble samples:

```
./softcpu assemble programs/hello.asm -o build/hello.bin
./softcpu assemble programs/fibonacci.asm -o build/fib.bin
./softcpu assemble programs/timer.asm -o build/timer.bin
```

Run:

```
./softcpu run build/hello.bin  --trace
./softcpu run build/fib.bin
./softcpu run build/timer.bin  --cycles 20 --trace
```

Notes: Omit `--trace` for clean program output.

Team Contributions

Ganesh led architecture definition, ISA spec, memory map, emulator entry-points, and CLI tooling.

Tushar implemented core CPU logic: ALU, status flag semantics, and control-unit sequencing.

Jeevan authored the assembler, directive/label resolution, and example programs (Hello, Fibonacci, Timer).

Sindhura produced documentation (architecture/emulator/assembler/programs), the schematic, demo video, and compiled the report.