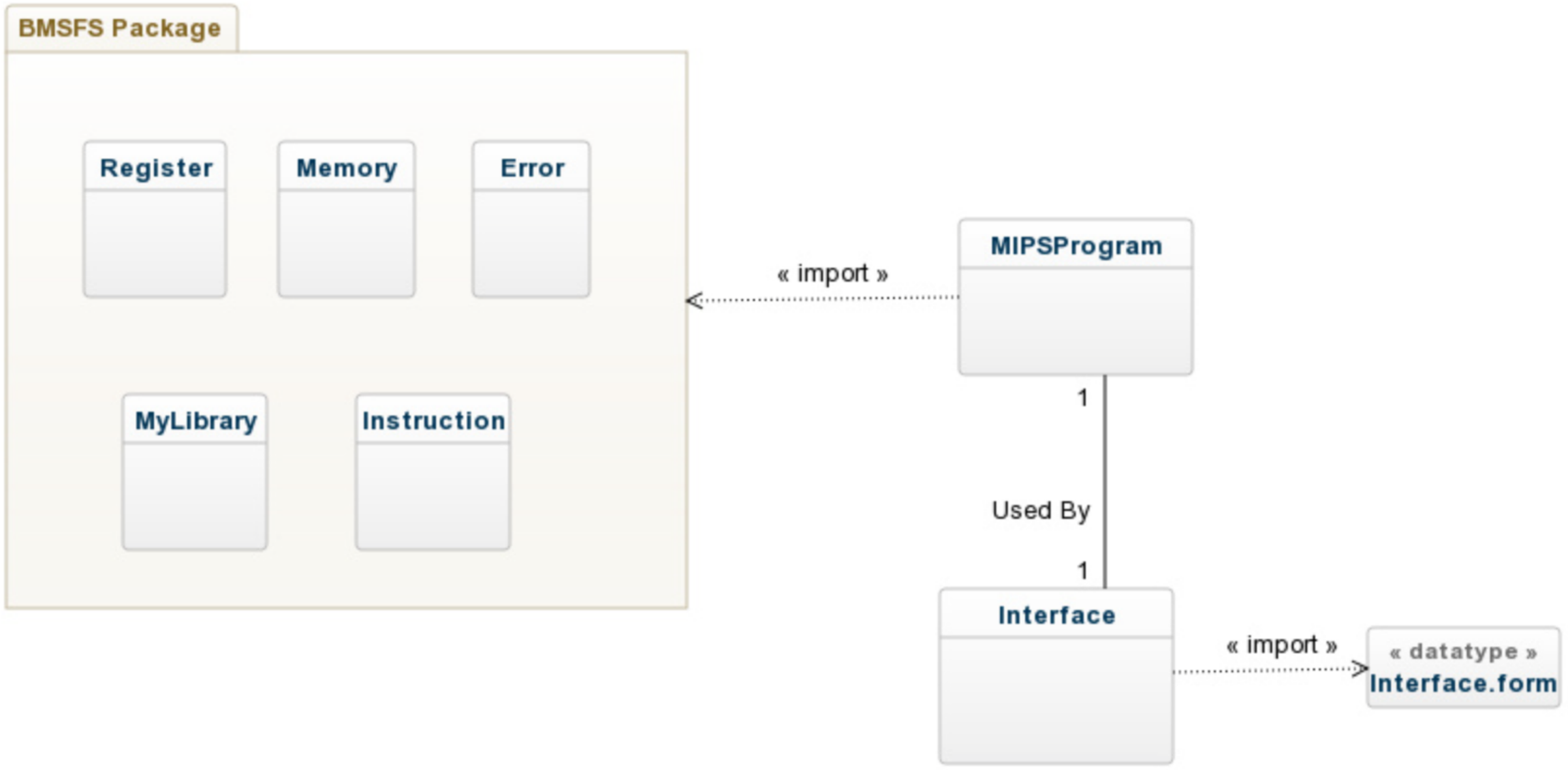
Code Report

Experiment - MIPS Assembly Language II
Team 9

Introduction

- MIPS II - A Virtual Lab experiment.
- Aim: Online/Browser-based experiment to aid learning
- Scale: 1 core module, 1 interface, 7 classes and over 2700 LOC
- Problems:
  - Java Plug-in required.
  - Use of legacy/deprecated functions
  - No documentation


BMSFS Package
Register
Memory
Error
MyLibrary
Instruction
« import »
MIPSProgram
1
Used By
1
Interface
« import »
« datatype »
Interface.form

Metrics (I)

Class/Metric	Functions/ class	Parameters/Fn	Statements/Fn	Cyclometric	LOC	LOC-Comment ratio
Memory.js	12	1	8	3	205	25.25
Error.js	7	1	10	1	50	25.0
MyLibrary.js	12	1	4	1	35	17.5
Register.js	14	1	2	1	156	32.0
MIPSProgram.js	26	0.5	8	3	432	25.82

Code Smells

- Error - Divergent change, Switch statements, Lazy class, Shotgun surgery.

- Instruction - Conditional Complexity, Combinatorial Explosion,

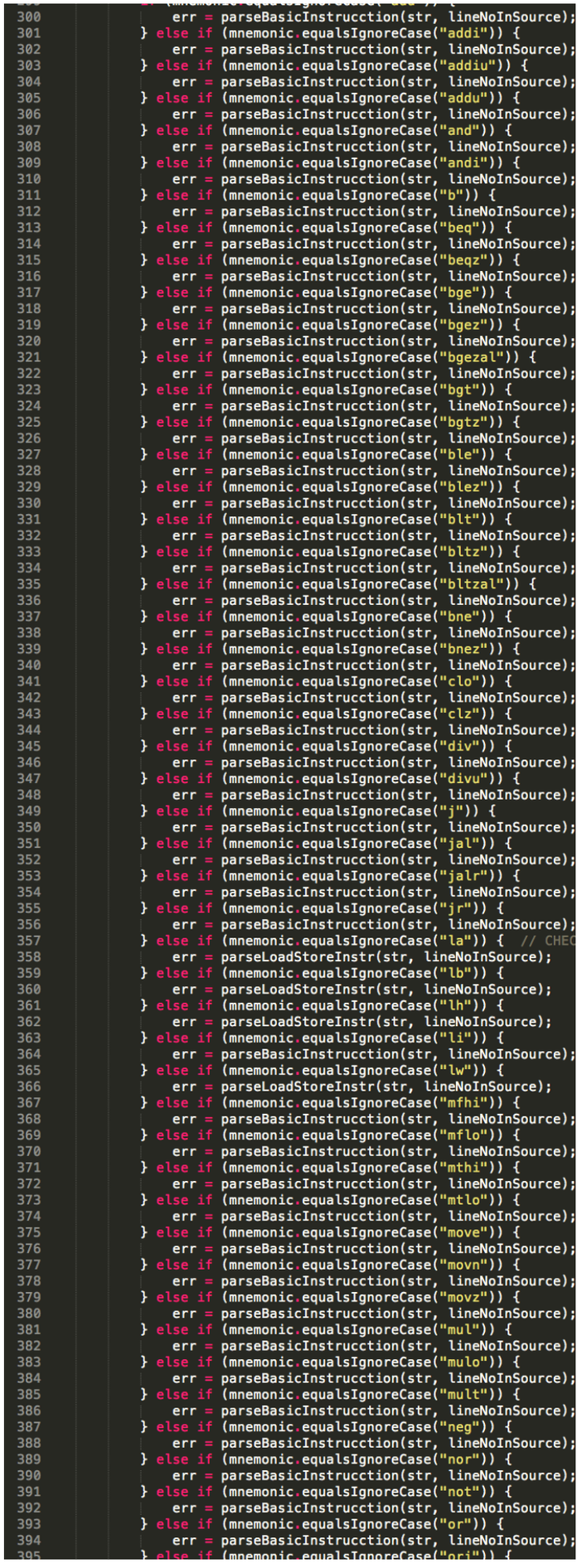
- Memory - Dead code, Methods too big, Hardcode

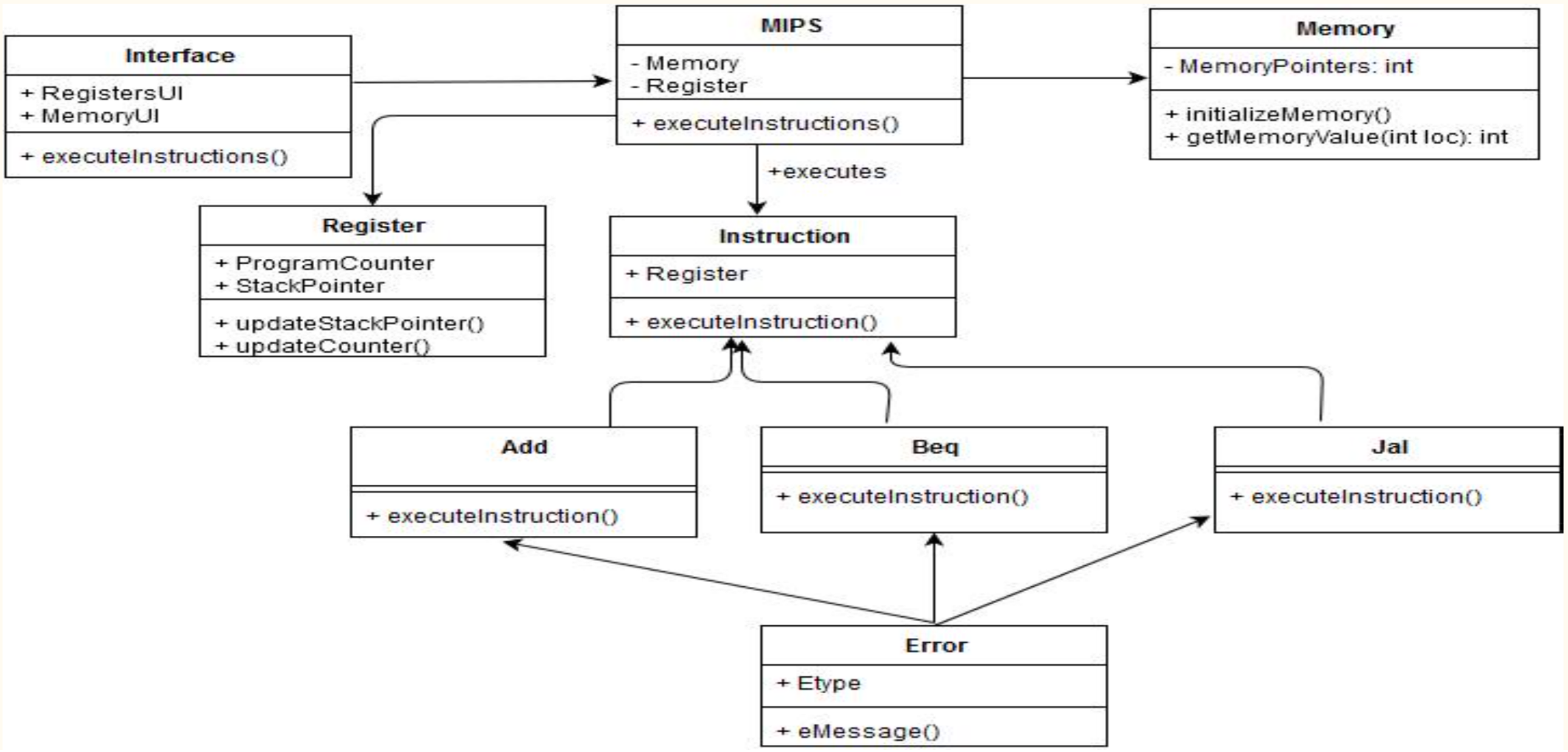
- Register - Conditional Complexity, No comments.

- MyLibrary - Class/Variables names, Scope too wide, Inconsistent method/argument conventions, Incomplete Library Class.

Code Smells (II)

- Combinatorial Explosion
- Indecent Exposure:
- Message Chains
- Solution Sprawl





Proposed Structure

Design Patterns

- Builder pattern -

```
if (operands[numOperands - 1] == -1) { // invalid register
    err = new Error("Syntax error @ line : " + lineNoInSource, Error.ASSEMBLE_TIME_ERROR);
```

- Interpreter pattern - Instruction is used to interpret ‘language’ from GUI before processing.
- Observer pattern - GUI subscribes to changes in BFSFS objects.
- Chain of Responsibility - Instruction is used to comm. between GUI and core.
- Iterator - Implemented in Instruction module to execute one at a time.

Take-aways

- Time required !~ Lines of code
- 1) Think/Design 2) Code. Not the other way round.
- Need to have common coding standards when working in a team.
- No free lunch

“I'm not a great programmer; I'm just a good programmer with great habits.”

– Martin Fowler