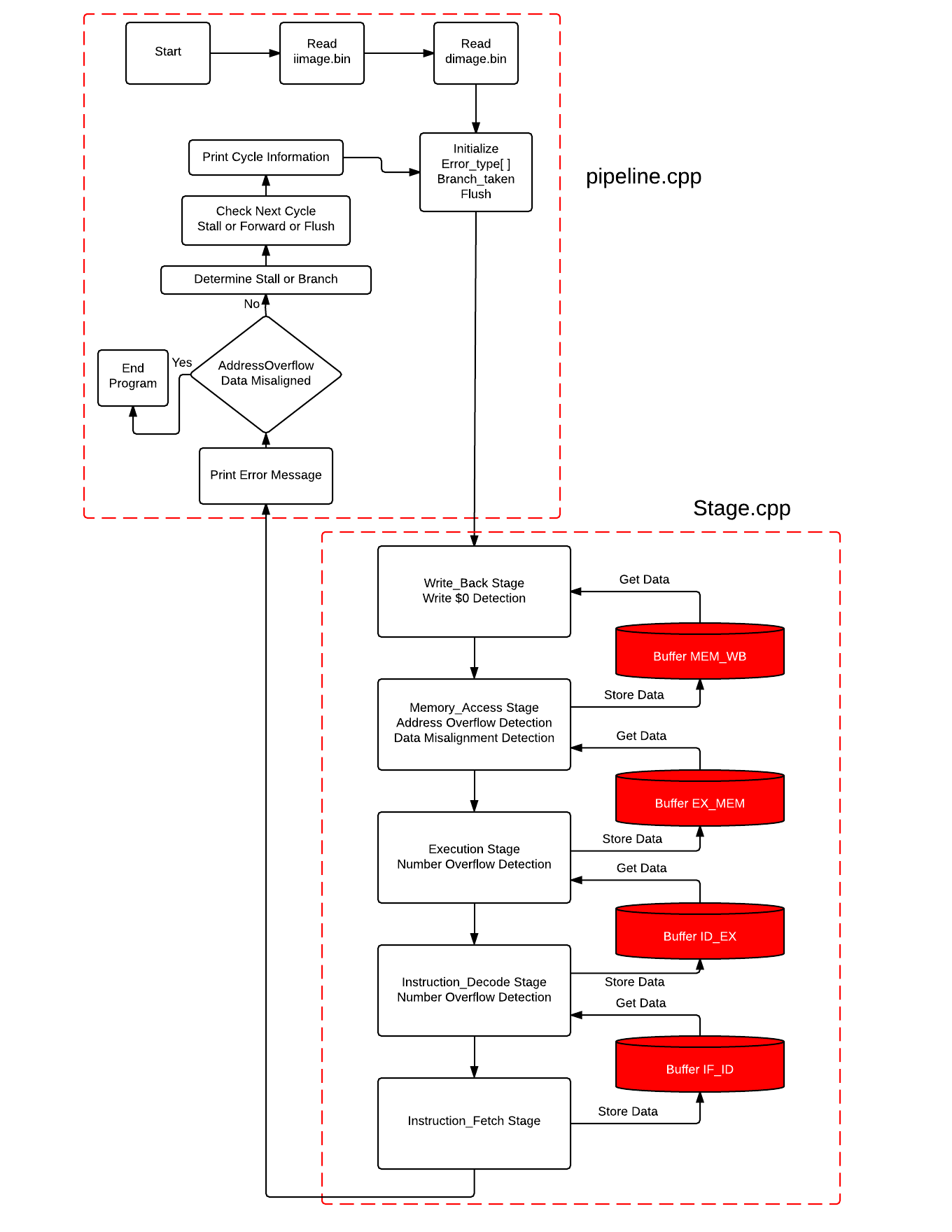
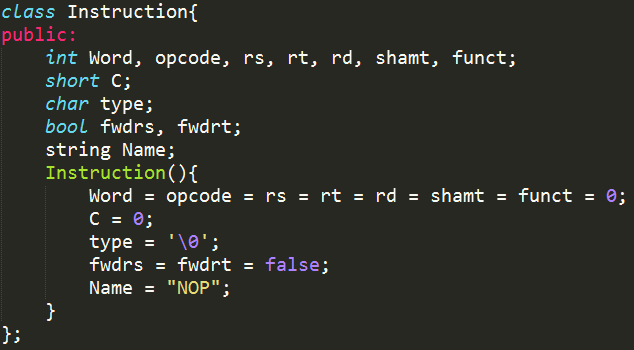
103062331 Archi\_Project1\_Report

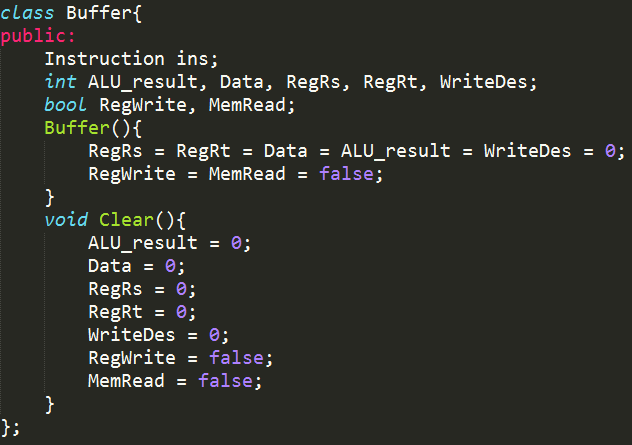
1. Project Description
   1. Program Flow Chart

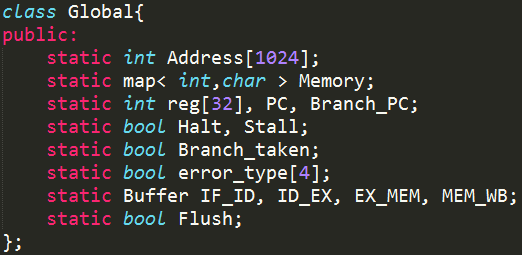


* 1. Detailed Description

1. Classes Define







Memory (Store Data), reg[32] for 32 registers

PC for Program Counter, Branch\_PC for PC to be branched

Halt for ending the program, Stall for whether to stall

Branch\_taken for whether to branch.

error\_type[4] for four types of errors.

1. Read iimage.bin

Int Word (Store Instruction). Use get() to get a char each time

Word = (Word << 8) | (unsigned char) ch ; (Four times to get a 32-bit)

Store Program Counter into PC

Store Word into (map<int, int> Address), which is easier to access.

1. Read dimage.bin

The same as (2.)

Store Stack Pointer into reg[29] ($sp)

Store Data into (map<int, char> Memory), which is easier to access.

1. Write\_Back Stage

Take instruction from MEM\_WB buffer.

Write data back to register.

1. Memory\_Access Stage

Take instruction from EX\_MEM buffer.

Access the memory to get data and store data

Store data and instruction into MEM\_WB beffer.

1. Execution Stage

Take instruction from ID\_EX buffer.

Use ALU to do calculation.

Store data and instruction into EX\_MEM beffer.

1. Instruction\_Decode Stage

Take instruction from IF\_ID buffer.

Decode the instruction.

Store data and instruction into ID\_EX beffer.

1. Instruction\_Fetch Stage

Fetch instruction from Address[PC]

Store data and instruction into IF\_ID beffer.

1. Print Error Messages

Use for loop to check error\_type[0 to 3], if error occurs, output the error messages.

1. Check Halt

If Halt is true, end the program.

Else check next cycle’s stage whether to Stall or Forward or Flush

Output the register and PC status at this cycle, and continue.

1. Close File

Close snapshot.rpt and error\_dump.rpt.

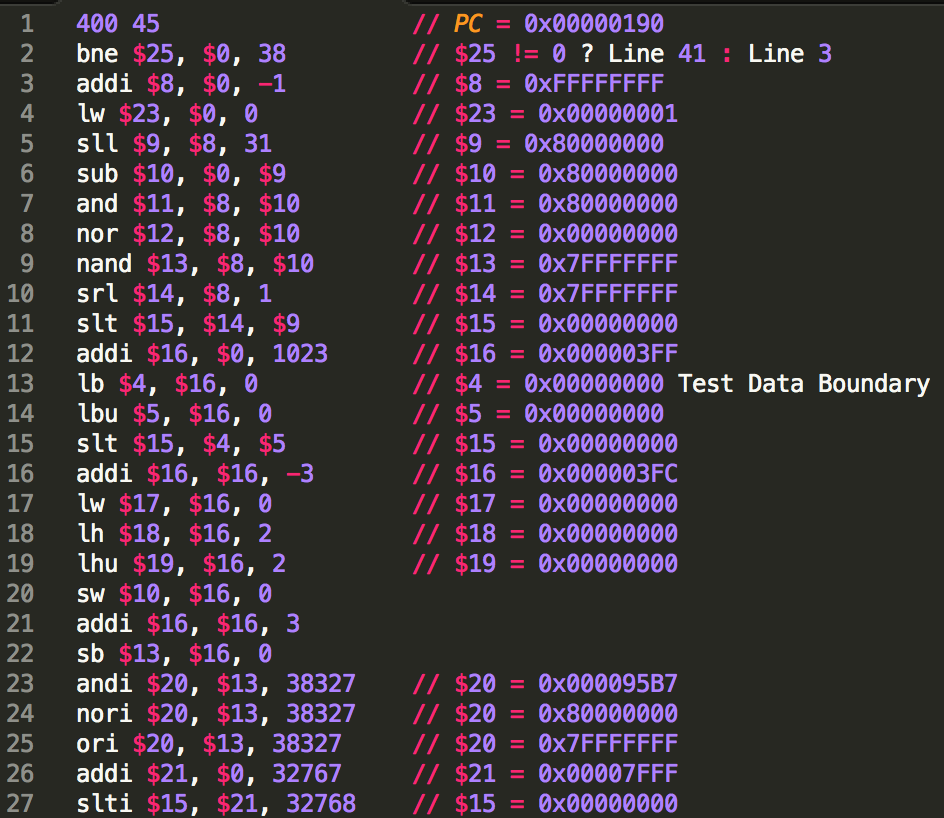
1. Test case Design

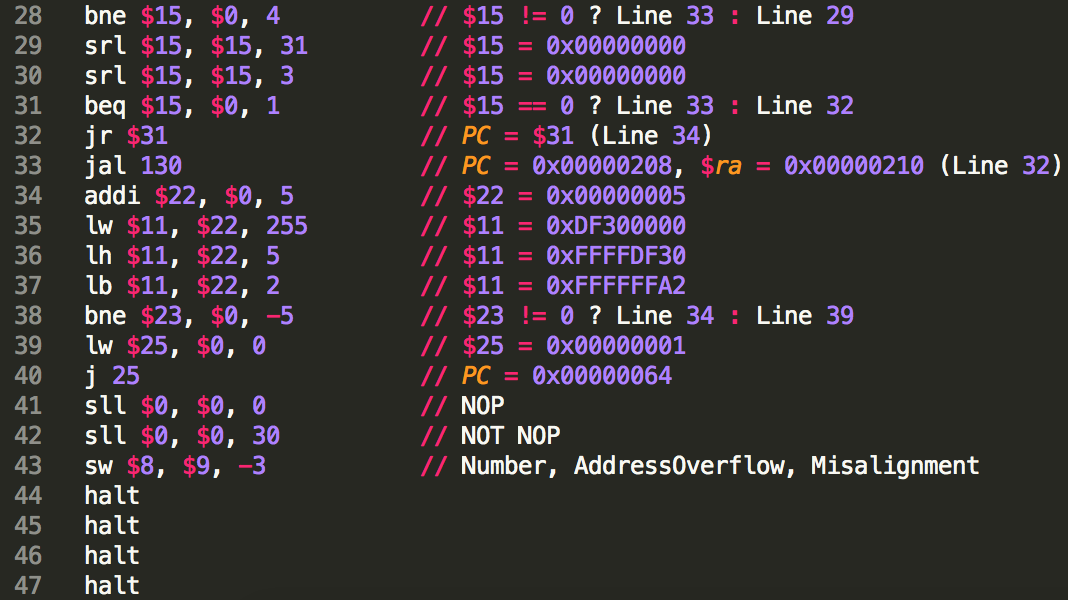
2-1) Detail Description of Test case

Basically, my test case will test every function except bgtz.

And test Write $0, Number Overflow, Address overflow, Data Misalignment

I’ll show it as a graph step by step.





About dimage.bin :

I randomly generate the data inside it (1024 Bytes)

I just modify some specific position which I will use in the test case.