CSEN702 MICROPROCESSORS PROJECT REPORT (TOMASULO SIMULATION)

Approach :

We modelled Each component in a tomasulo architecture as an Object with methods and attributes.

Classes created :

1- Processor : it’s the engine of the project :

Consists of

1- 3 multiply stations

2- 2 add stations

3- 3 store buffers

4- 3 load buffers

5- a bus

6- program

7- register file

8- memory

9- cycle number

10- program counter

Contains many methods that we will explain the development process.

2- ReservationStation

Contains array of reservation rows , type of station , and instruction latency

3- Reservation

this is one row of the reservation station

contains qj, qk, vj, vk, op, reservationID, address A , index of instruction in program , and busy flag

4- ReservationID

Consists of index of row and A OR M depending f station type

5- Bus

Consists of ID of publisher and value published

6 -LoadBuffer

Consists of A , ID , busy flag , index of instruction in program

7- LoadBuffers

Array of loadbuffer rows , contains also latency of load instruction and stationtype = load

8- Instruction

Contains : instructionType, rs, rt, rd ,offset , start and end execution cycle

9- Memory :

Array of floating values of size 2048

10- Parser

A class that has one method which reads a textfile and parse into a Program Object

11- Program: an array of Instructions

12- Register : contains a floating/integer value and the ID of the station that will override the value

13- RegisterFile : an array of 32 integer registers and an array of 32 floating registers

14- StoreBuffer : busy flag,

A (address to store in),

Value,

Q ( ID of instruction going to change register before buffer ),

Index of instruction in program

15- StoreBuffers :

Array of storebuffer rows , contains latency

Enumerables:

1- InstructionType ADD.D or SUB.D or MUL.D or DIV.D or L.D or S.D

2-Op ADD.D or SUB.D or MUL.D or DIV.D and the difference between it and the one before is that this is the one stored inside the reservation , but instruction type is saved in the program

3- StationType ADD , MUL , LOAD