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COL216 ASSIGNMENT-7

We have created two module of memory as in mips program. One is text and another is data. All the instruction is stored in txt memory and data are stored in data memory. User written program (instruction) are given as an input to initialize text memory in form of file and data is also given in form of file as an input. Another input to our program is a table stating number of clock cycles takes by different instructions. With the help of this table we can calculate total number of clock cycles taken by our processor to execute whole program. We are also counting the number of instructions we processed to calculate instruction per cycle (ipc) i.e. total number of instruction / total number of cycle. We have printed ipc on the console. We have printed the simulated program in two different files. register.txt for register file and memory.txt for memory file. After each instruction we processed we printed the new state of the register file in one line in register.txt and similarly new state of data memory in memory.txt file in one file. It is to be noted that during instruction execution (processing) only data memory and register file is changing. Instruction memory is unchanged.
Instruction implemented are same as previous assignments-

1. add rd rs rt => reg[rd]=reg[rs]+reg[rt]
2. sub rd rs rt => reg[rd]=reg[rs]-reg[rt]
3. sll rd rt shamt => reg[rd]=reg[rt]*pow(2,shamt)
4. srl rd rt shamt => reg[rt]/pow(2,shamt)
5. lw rt rs offset => reg[rt]=data[reg[rs]+offset]
6. sw rt rs offset => data[reg[rs]+offset]=reg[rt]
7. jr rs => i=reg[rs]
8. j target => i=target
9. jal target => reg[31]=i+1 and i=target
10. beq rs rt offset => i=i+1+offset when condition is true
11. bne rs rt offset => i=i+1+offset when condition is true
12. blez rs offset => i=i+1+offset when condition is true
13. bgtz rs offset => i=i+1+offset when condition is true

We have provided a makefile which compile our Processor.cpp and create a executable which we run with three input mentioned above- text.txt, data.txt and cpi.txt

Three outputs are there one is on console which shows clock cycle counts and average Instructions Per Cycle (IPC). Other two outputs are in two different files- memory.txt and register.txt (part of simulation).