

CO 224 : Computer Architecture
Lab 06 – Part 2 : Comparison Report

Group 07

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Performance Comparison

Operation	Time Consumed	
	With Data Memory	With Data Memory and Cache
Read/Write Hit	40 Clock cycles	1 Clock cycle
Read/Write miss (Dirty Bit = 0)	5 Clock cycles	21 Clock Cycles
Read/Write miss (Dirty Bit = 1)	5 Clock cycles	41 Clock cycles

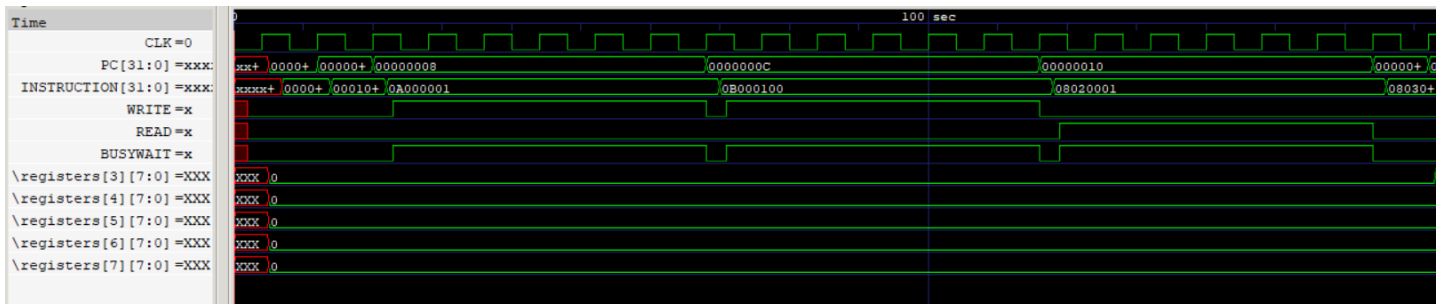
By considering above table,

- CPU with cache have better performance than CPU without cache memory, when operation is Read/Write hit.
- But if operation is Read/Write miss (Dirty bit = 0 / Dirty Bit = 1), then CPU without cache gets less time than CPU with cache memory

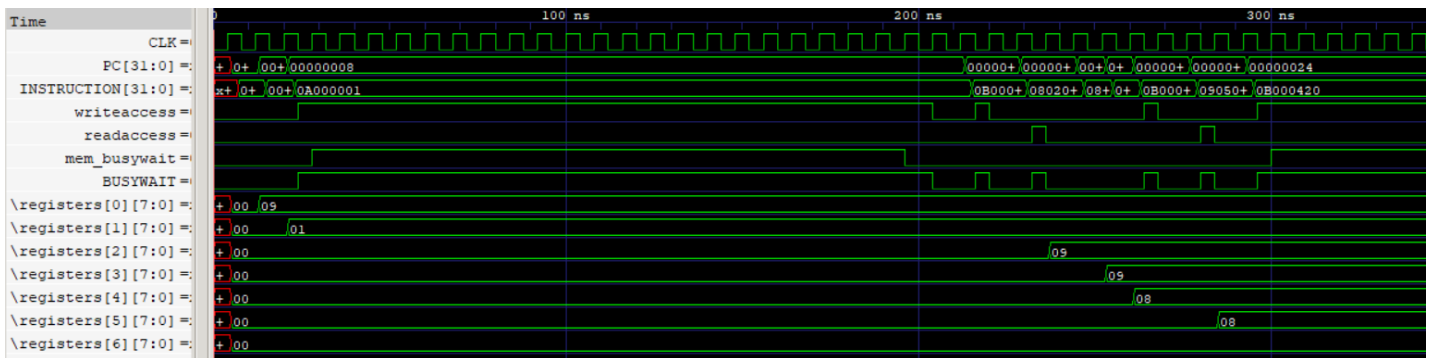
Advantages when using CPU with Cache memory

- CPU isn't stalling.
- CPU has good performance when Read/Write Hit count is high.

Timing Diagram of CPU without Cache Memory



Timing Diagram of CPU with Cache Memory



Instruction Set used for performance check

```

loadi 0 0x09
loadi 1 0x01
swd 0 1
swi 1 0x00
lwd 2 1
lwd 3 1
sub 4 0 1
swi 4 0x02
lwi 5 0x02
swi 4 0x20
lwi 6 0x20

```

Time Consumed for CPU without Cache memory – 374 time units

Time Consumed for CPU with Cache memory – 645 time units

*CPU without Cache memory get lower time than CPU with Cache memory because Hit rate of instruction set is very low.