1. A program finishes a task in 10 hours and 70% of this program can be parallelized. According to the Amdahl's law, how much will it cost if the program uses 4 processors to work on this task?

1. 4.75 h
2. 7 h
3. 4 h
4. 3.57 h

Solution:

2. If the L1 cache has 20% miss rate with no penalty on hits, while the L2 cache has a 10% miss rate with 10ns hit time, i.e., to transfer data to L1 cache. The system memory has an access latency of 70ns, and it has 1% possibility that it will access the virtual memory space on disk, which introduces 1ms penalty. What is the average memory access time for a load word operation?

A. 203.4 ns

B. 212.4 ns

C. 2012.4 ns

D. 3.6 ns

Solution:

3. Consider the MIPS program:

i) DIV.D F4, F2, F1

ii) SUB.D F5, F4, F1

iii) ADD.D F4, F8, F2

iv)L.D F2, 8(R1)

(Hint: op dst, src1, src2)

We always want to exploit ILP as much as possible, so we often reschedule the code and implement out of order execution to minimize the stalls, but we may encounter data hazards. In our case here, which of the following statements is correct?

A. WAR: ii) and iii)

B. WAR: i) and ii)

C. WAW: iii) and iv)

D. RAW: i) and iv)