Q10

Due Nov 4 at 11:59pm **Points** 100 **Questions** 5
Available Nov 3 at 12pm - Nov 4 at 11:59pm 1 day **Time Limit** 25 Minutes

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	18 minutes	0 out of 100 *

* Some questions not yet graded

ⓘ Correct answers will be available on Nov 5 at 12am.

Score for this quiz: **0** out of 100 *
Submitted Nov 4 at 11:47pm
This attempt took 18 minutes.

Question 1

Not yet graded / 20 pts

Name one bottleneck in uniprocessors that prevents exploitation of ILP efficiently.

Your Answer:

There are less threads, which will make it lack parallelism. One big bottleneck is due to memory stalls, since there is only one thread, the whole system stalls for cache misses. Where a multi-thread system can go onto the next instruction while the other thread is waiting for mem access to finish.

Increasing complexity of the issue logic,

or, lack of parallelism in single threaded programs,

or, increasing power consumption to support aggressive speculation

Question 2

Not yet graded / 20 pts

Give an example application, other than the vector operation example shown in the slide, which is abundant of thread-level parallelism. Be specific.

Your Answer:

Anything that requires multiple users accessing information from the same place. This can include basically everything on the internet from online transactions, web apps, social media sites, networking in general, database queries, and even the web servers themselves. basically, almost everything in modern computing can be improved by TLP lol.

Question 3

Not yet graded / 20 pts

Briefly explain the main idea of simultaneous multithreading.

Your Answer:

SMT is basically running multiple threads on the same uniprocessor/core depending on the manufacturer. For instance, Intel calls this Hyper Threading, which allows a single core the ability to run 2 threads on one uniprocessor/core. Intel i9 9900K 2018 has 8 physical cores and 16 threads, meaning each core can run two threads simultaneously, which improves performance.

In a multi-issue dynamically scheduled superscalar processor, instructions from different threads are issued and executed without regard to which threads they come from.

Similarly speaking, multiple threads can be executed simultaneously by a processor.

Question 4

Not yet graded / 20 pts

Show the main differences between symmetric multiprocessors and distributed memory multiprocessors.

Your Answer:

With symmetric mp, they share a centralized memory with same latency/access time. Doesnt scale well.

With distributed, memory is associated with each processor. Mem latency/access isnt always equivalent, depends on the systems since they can be different. This scales better however.

in symmetric MP, a centralized memory is shared by all processors with the same memory access latency. It is not scalable beyond 8 nodes.

In distributed memory MP, memory is physically distributed and associated with individual processors. Memory access latency become non-uniform as latency to access local memory is shorted than that of accessing remote memory. It can be scaled to include more than 8 nodes.

Question 5

Not yet graded / 20 pts

List the two main challenges of parallel processing.

Your Answer:

1. Programs/apps need to be rewritten in order to take advantage of the extra threads. So programs will have to be changed/updated in order to take advantage. This can take a significant amount of work rewriting code.

2. Larger memory cost due to remote accesses. Higher memory

latency/access time due to this, which increases miss penalties/time.

Limited parallelism in an application, and high cost to access remote memory

Quiz Score: **0** out of 100