EE 382C/361C: Multicore Computing	Fall 2016

Lecture 27: November 29

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Question 1

Which of the following statements about blocks and threads in CUDA are **FALSE**?

A. The maximum number of threads per block is determined by the hardware architecture of the GPU.
B. The method *__syncthreads()* acts as a barrier to synchronize all threads within a block.
C. Two threads located in different blocks can synchronize with each other within the kernel.
D. Branches (e.g. if/else) in the kernel can potentially reduce parallelism between threads.

Solution: C

Question 2

Which of the following statements about shared and global memory in CUDA are **FALSE**?

A. Global memory has the scope of the entire application.
B. Shared memory is usually on-chip and faster than global memory.
C. Global memory has to be declared outside the kernel.
D. Shared memory cannot be accessed by the host.

Solution: C

Question 3

Which of the following statements about kernel functions in CUDA are **TRUE**?

A. Kernel functions are called by the host and run on the device.
B. The return type of kernel functions can only be *void*
C. We can have multiple kernel invocations in an application.
D. All of the above.

Solution: D

Question 4

In the work-optimal algorithm for computing array maximum discussed in class,

A. the array of size n is partitioned into *(n/log log n)* groups of size *O(log log n)*.
B. sequential algorithm is run on each of the groups to get the maximum value of each group.
C. the doubly logarithmic height tree algorithm is used to get the maximum value of the group maximums.
D. All of the above.

Solution: D

Question 5

In the work-optimal algorithm for merging two sorted arrays discussed in class,

A. the ranks of splitters are computed using the parallel rank-computation algorithm.
B. sublists are merged using the sequential merging algorithm.
C. the overall time complexity is *O(log n)*.
D. All of the above.

Solution: D

Question 6

In the list ranking algorithm discussed in class, what technique is used to reduce the length of the longest path in the linked structure in each iteration?

Solution: Pointer jumping

Question 7

In the breaking symmetry algorithm discussed in class, what is a possible method to guarantee that initially all nodes have valid coloring?

Solution: Each node could initially have different color by using its unique identifier.

Question 8

Briefly describe the upward sweep and downward sweep procedures in the Blelloch Scan algorithm.

Solution:
Upward: *sum[v] = sum[Left[v]] + sum[Right[v]]*;
Downward: *scan[Left[v]] = scan[v]; scan[Right[v]] = sum[Left[v]] + scan[v]*;