Test #1

Due May 1 at 11:59pm

Points 100

Questions 40

Available Apr 27 at 2pm - May 1 at 11:59pm 4 days

Time Limit 60 Minutes

Instructions

Canvas calls this a "Quiz", but it is really Test #1.

It consists of 40 multiple choice questions to be done in 60 minutes. It is Open Notes and Closed Friends.

Once you start, you must finish. Canvas will not let you pause and come back.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	41 minutes	100 out of 100
•			

(!) Correct answers will be available on May 2 at 12:01am.

Score for this quiz: 100 out of 100

Submitted Apr 29 at 12:20am

This attempt took 41 minutes.

Question 1	2.5 / 2.5 pts
The difference between omp_set_lock() and omp_f	test_lock() is:
The second one blocks, the first one doesn't	
The second one sends an interrupt, the first one doesn	ı't
The first one blocks, the second one doesn't	
The first one sends an interrupt, the second one doesn	n't

Moore's Law (as Gordon Moore actually phrased it) says: Transistor density doubles every 1.5 years The number of cores doubles every 1.5 years Parallel fraction doubles every 1.5 years

Olock speed doubles every 1.5 years

In multithreading, the threads all share: Heap, Execution instructions, and the same Stack Execution instructions, Global variables, and the same Stack Heap, Execution instructions, and Global variables

The observation that clock speed doubles every 1.5 years:

Is only correct for CPUs, not GPUs

Was never actually observed

Was the case for a while, but does not apply anymore

Has been correct starting in 1965 and is still happening

Question 7

The cache that is smallest and fastest is:

L3

L2



Question 8	2.5 / 2.5 pts
SPMD stands for:	
Significant Parallelism, Much Data	
Significant Parallelism, Multiple Data	
Single Program, Multiple Data	
Single Program, Much Data	

In Project #2 (Numeric Integration), why do you need to double the volume you compute (the Z axis is up-down, the X axis is left-right)? Because superquadrics have both a left and right half and we are only computing the volume of the right half Because superquadrics have both a top and bottom half and we are only computing the volume of the top half Because superquadrics have both a top and bottom half and we are only computing the volume of the bottom half

Writing to it automatically triggers a power-of-two reduction operation

When each thread writes to it, the value goes to the same memory address

Each thread has its own copy of it

Question 11 2.5 / 2.5 pts

When using OpenMP Tasks to apply parallelism to traversing a binary tree, the uniformity of the distribution of tasks among the threads:

- Depends on how well you use the OpenMP task clauses
- Depends on the amount of physical memory you have
- Depends on the compiler
- Depends on the type of CPU



Question 13 2.5 / 2.5 pts How many Bonus Days are you allowed in CS 475/575? 6 2 3 6 4

Question 14 2.5 / 2.5 pts When adding up the elements of a 2D array in C or C++, it is faster to add the elements: It makes no speed difference either way

Vetically (i.e., down the columns) first
Vetically (i.e., down the columns) first

Question 15	2.5 / 2.5 pts
A way to prevent harm from race conditions is:	
Shared variables	
Mutual Exclusion Locks	
Private variables	
O Dynamic scheduling	

The reason that our OpenMP programs have a NUMTRIES for-loop is to: Determine the median performance Determine the range of performance numbers Determine the peak performance Determine the standard deviation of performance

Question 17 2.5 / 2.5 pts



Question 19	2.5 / 2.5 pts
A Barrier is:	
A location in code that threads are not allowed to pas	ss ever
A location in the code where threads can spawn other	er threads



The word "deterministic" means: The program outputs change every time you run the program The program outputs change whenever you change the number of threads The same inputs will always produce the same outputs It describes a quantity that you are attempting to determine

Question 21	2.5 / 2.5 pts
You cannot use multithreading without multicore system.	having a
O True	
False	



Coarse-grained parallelism is:

- Dividing the problem into a large number of small pieces
- Dividing the problem into a small number of large pieces
- Dividing the problem into equal-size pieces

Dividing the problem into pieces, of all which have to be a different size

2.5 / 2.5 pts **Question 24**

Hyperthreading is:

- Keeping one or more extra thread states within a core
- Adding extra cache space



Adding more memory bandwidth	
Adding one or more cores	

Question 25	2.5 / 2.5 pts
Γhe advantage of using the OpenMP <i>reductio</i>	n clause is
No advantage, it is just cleaner code	
 Actually a disadvantage it can produce wrong, no answers 	on-deterministic
It is less likely to result in a compiler error	
It greatly speeds, and makes thread-safe, reduce	ction operations

Question 26 The theoretical maximum speedup that you can ever achieve, no matter how many cores you add, is: 1/Fs 1/Fp 1/(Fp+Fs)

Question 27 2.5 / 2.5 pts

The difference between using OpenMP Tasks vs. using OpenMP Sections is that:	
Tasks are dynamically allocated, sections are static	
Tasks are statically allocated, sections are dynamic	
 Sections are deprecated 	
Nothing they are different words for the same thing	

A "Mutex" is:

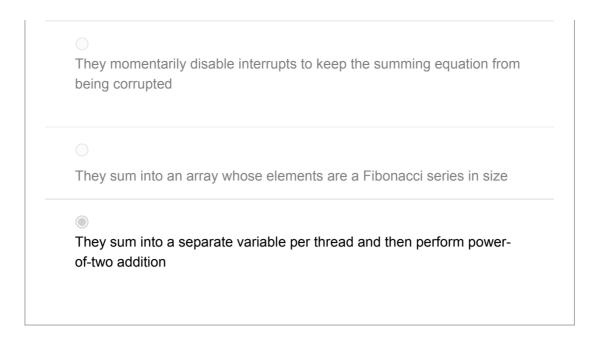
A "mutual text" message

A sound you make when you sneeze

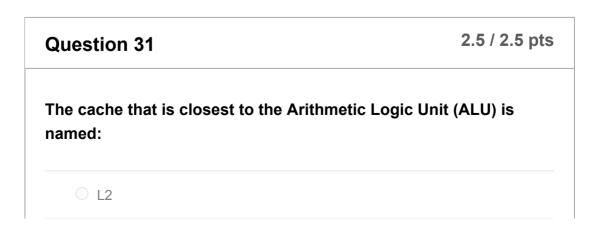
A "multiple texture" for graphics processing

Another term for a "mutual exclusion lock"

2.5 / 2.5 pts
r Critical because:
ne programmer



The line "#pragma omp single" is used to: Force this block of code to be executed in single-file order by each thread Force this block of code to be executed by one thread only Force this block of code to undergo a single reduction Force this block of code to be divided up into individual OpenMP sections





In Project #1 (Monte Carlo) Joe Graphics coded this:

float sthd = sths[n];
float svx = sv * cos(sthd);
float svy = sv * sin(sthd);
and got the wrong probability. Why?

Called the wrong trig functions.

Accidentally switched cos and sin

Forgot to turn degrees to radians.

Question 33	2.5 / 2.5 pts
How many multiplies can an SSE instruction once?	ction perform at
8	
4	
O 2	
O 16	

A Deadlock condition is when:

Two threads are each waiting for the other one to do something

The CPU chip cannot find any more instructions to execute while waiting for a memory fetch

When it is a race to see which of two threads get to a piece of code first

When you keep internal state

Question 35 2.5 / 2.5 pts

"Prefetch Distance" is:

How many bytes you expect to use from a particular cache line

How many CPU cycles get used while waiting for a cache line to load

How many cache lines you are loading at a time

How far ahead you are loading a cache line before you need it

Question 36 2.5 / 2.5 pts

Speedup Efficiency is defined as:



Gustafson's Observation on Amdahl's Law says:

More cores often results in more data, which results in a larger parallel fraction

Amdahl's law was applicable when it was formulated, but doesn't apply now

More cores often results in memory contention and decreases performance

Amdahl's Law only applies when you have a number of cores that is less than or equal to 8

Question 40

2.5 / 2.5 pts

Using "default(none)" in an OpenMP #pragma is:

- Required
- A deprecated feature of an older version of OpenMP
- A way to possibly increase performance
- A good idea, but not required



Quiz Score: 100 out of 100