CSCI 4061 Discussion 8

3/19/18

Overview

- Quiz 7 Problem 1 Solution
- Threads
- Exercise

Quiz 7 Problem 1

Assume a 64-bit architecture, sizeof(int) = 4, sizeof(double) = 8, and sizeof(char) = 1.

The code below requires **how many bytes in the current function's stack frame?**

```
char* strings[10];
for (int i=0; i < 10; ++i) strings[i] = (char*) malloc(sizeof(char) * 128);
double * dubs = (double*) malloc(sizeof(double) * 64);
int vals[32][32];
```

- Answer: 4460 bytes on the stack.

Threads

- More lightweight method of parallelism and concurrency.
- Less communication overhead than processes.

pthread_create and pthread_join

- **pthread_create(pthread_t*, pthread_attr_t*, function*, void*);**
- Creates a thread which starts executing at the start of the function pointed to by the third argument.
- **pthread_join(pthread_t, void* retval);**
- Blocks the calling thread until the thread represented by the first argument terminates.

Note on GCC/Makefiles

- When using the pthread library, you must use the -pthread flag in your compiler command.
  - gcc -std=c99 -pthread -o ans.o rec8.c

Exercise

- Finish C code in files provided for today.
- It consumes an integer, n.
- Creates two nxn matrices (2D int arrays), filled with random values.
- Performs a multithreaded matrix addition.
- Performs a single threaded matrix addition.
- Print out the time for single vs multithreaded.