Operating Systems : Project 3 - Multithreaded Programming

DUE DATES :

1. **Completed Source Package : CS SUBMIT PRJ3 by Thursday 4/23 11:59PM**
2. **Report : Blackboard by Friday 4/24 11:59PM**

1. Introduction:

The task for this project is to implement multithreaded matrix multiplication within the provided code package. Please review your textbook, class notes, and the Blackboard linked online references related to threads and pthreads. You may also want to review the Man-Page for the **clone** system call if you are attempting tier 2.

For the basic matrix multiplication algorithm, please see :
http://en.wikipedia.org/wiki/Matrix_multiplication_algorithm#Iterative_algorithm

2. Implementation:

You are to implement the following function in the **matrix_multiply.c** file.

```
/*    Multiplies two matrices using threads

      lhs - left matrix pointer
      rhs - right matrix pointer
      result - pointer to uninitialized matrix
      threads - number of threads to use

      Result is stored in result matrix.
      Result matrix will only be initialized if the operation was successful
      (no need to destroy on failure)

      Returns error code
*/
err_code matrix_multiply(matrix *lhs,
                         matrix *rhs,
                         matrix *result,
                         const unsigned int threads);
```

You are to use the standard three-loop, iterative method to compute the solution to the matrix multiplication using a data-parallelism approach.

- **Tier 1: Use *pthreads* API**
- **Tier 2: Use *clone* system call and implement your own thread management functions as needed.**

3. Analysis and Report:

You are to write a report briefly describing your approach to parallelizing the matrix multiplication implementation. The report should include the image that is produced as part of the analysis program. The report should detail the hardware specs of the system on which experimentation was conducted. The report should **not exceed three (3) pages**.

4. CODE SUBMISSION

Clean everything up with make clean, clean out your build directory.

Add a README text file that states any information you want to share with the TAs for grading.

```
cs_submit CS4520_01  PRJ3   pawprint_prj3_directory/
```