Birla Institute of Technology & Science, Pilani, K. K. BIRLA Goa campus
Operating Systems
First Semester 2013-2014
Tutorial 6
Basics of Multi-Threaded Programming

Q) Matrix Multiplication using Pthreads -

Write a program to multiply two matrices $\mathbf{A_{m*k}}$ and $\mathbf{B_{k*n}}$ and store the result in a matrix $\mathbf{C_{m*n}}$

Steps:

1. Define m,n and k as constants using the *#define* macro. Declare the arrays A,B and C as global.
2. Initialize A and B in the program itself. (Do not read array values from a file or the command line)
3. Create a total of **m*n threads**, one each for computing a single element of the matrix C.
4. Store the thread ids in a single dimensional array of size m*n.
5. The row of A and column of B to be multiplied is passed as an argument to the thread. (Hint : Use a structure variable as the argument)
6. The runner function multiplies the i^{th} row of A and j^{th} column of B and stores the result at C(i,j).
7. The main thread should wait for all the threads created to complete before terminating. (Use the functions *pthread_join()* and *pthread_exit()* appropriately)
8. Print the resulting matrix C on the screen.