CS431: Assignment 5

***Submission Procedure: Email your prolog program and test cases as attachment to < asahu AT iitg.ernet.in> and name of the attached file should be #RollNo.Assign5.CS431.cilk and be #RollNo.Assign5.CS431.c. Simple but efficient Rule: Copy case Lead to F grade.***

Deadline: 11.55PM 28 October 2013: Compute server is an important and scarce resource for this assignment. Please try to finish your work as early as possible. If all people attack the server towards deadline then you will not get proper performance of parallel program.

**Assignment Statement: Improve performance of given Application (LBM) using parallelization technique**

(a) Parallelize serial code lbm.c using Openmp and test performance of your parallel code on compute server.
(b) Parallelize serial code same lbm.c using Cilk and test performance of your parallel code on compute server.

Improving performance means: you need to reduce execution time of application LBM by using better manual parallelization strategy. Output of parallel code should be same /similar as serial code. (Output velocity graph should be similar for parallel codes w.r.t. serial code)

Better parallelization result better grade.

You are not allowed to change this part of the program

```
#define XMAX 512 /*Mesh size in x-direction */
#define YMAX 512 /*Mesh size in y-direction */
#define ZMAX 10 /*Not a-direction */
#define STEP 8
#define MAXiter 200
```

***Resources*** http:// jatinga.iitg.ernet.in/~asahu/cs431/lbm.c
http:// jatinga.iitg.ernet.in/~asahu/cs431/cilk-5.4.6.tar.gz
**Compute server:** IP: 202.141.80.43, SPEC: Intel Xeon dual quad core with 16 thread and 32GB of RAM. Our department scientific officer will send about newly created user account and password information to all the CS431 registered students.
**Important Instructions:**

1. Compiling openmp program : $gcc –foepnmp test.c
2. Installing Cilk in your home directory: Download cilk-5.4.6.tar.gz, unzip in your home directory, Issue these following command
   $ ./configure --prefix=$(HOME)/cilk-5.4.6/ CFLAGS="-D_XOPEN_SOURCE=600 -D_POSIX_C_SOURCE=200809L"
   $make; make install
   Example matmul.cilk and make file is given.
   http://jatinga.iitg.ernet.in/~asahu/cs431/cilkmatmultest/
3. Application lbm.c uses gnuplot to plot the output resultant velocity of all iteration.