

# Operating Systems Lab Report

## Assignment 3

Abhishek Kumar Sah (19CS10004) & Saumyak Raj (19CS30040)

Due to the Physical limitations of the number of cores a processor can have we can do a very limited number of operations truly in parallel.

Let dimensions of the matrix 1 be:  $r_1 \times c_1$

Let dimensions of the matrix 2 be:  $r_2 \times c_2$

Then the dimensions of the resultant matrix will be  $r_1 \times c_2$

We have to fill  $r_1 \times c_2$  values in the resultant matrix. All these values will be independent of each other and hence they can be calculated in parallel if enough CPUs are present.

If all the CPUs are performing the designated task in parallel and we assume that all the task by individual CPUs is completed almost at the same time and no CPU takes on another task after completing its own, then the maximum size of the matrix which can be multiplied in parallel is

$$r_1 \times c_2 \leq n, \text{ where } n \text{ is the number of processors}$$

if the matrix is square with  $r_1 = c_2$ ,

$$r_1 \leq \sqrt{n}$$