

CS 431: Programming Languages Lab

Assignment set 1 (Concurrent programming)

Group: 39

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1. i) Write a short note on the benefit of having concurrency in modelling the problem.

- With the help of concurrency, CPU can be doing other things while waiting for IO.
- Like while inserting the 8 bit binary string to the list at the same time we can read the 8 bit binary string and do the pre process using the data. It helps in doing multiple things simultaneously other than waiting for the completion of a particular task.
- In single threaded application, thread have to keep track of both reading and processing state but in concurrency we can divide the task between multiple threads.
- Example: one thread will do the task of input, another thread will do pre- process and another thread will generate the desired output.
- This will reduce the waiting time of process and will make the computation of process much faster.

1. ii) Propose a concurrent solution for the problem.

- Here, we will be dividing the task between two types of thread.
- Thread 1 will be generating the random 8 bit string and insert the data in a Linked-List of particular thread. It will also be doing some pre-processing.
- Thread 2 will be reading the input from the Linked-list and do some pre-processing at the same time and generate the output on the basis of these datas.
- If the Linked-List of a particular thread is empty, then it will wait for Thread 1 to insert the input(random 8 bit string) and then continue the task.
- After creating 10 threads of type-1 Thread, all threads will run concurrent and will not affect the work of each other. Then we will create a thread of type-2 Thread which will give the desired output.

3. Calculator

- Here, we will be using **Swing** which is a GUI widget toolkit for **Java** for creating the GUI of calculator.

- We have created two threads, Thread-1 will be doing the task of taking the Input of operand and Thread-2 will be doing the task of taking the operator and if the operator is '=' then it will display the result too.
- We have used global variable(button pointer) to store the value of last clicked data.