## Concurrent & Parallel Programming

**Question 1**

Three threads work together to transform a list of data. Thread *producer* generates a list of random integer values in the range 0..999 and sends them to thread *filter* that removes all multiples of 5, 7 and 11 and sends all other values to thread *consumer* that sorts them and displays them on the screen. Each of these threads perform their tasks at different speeds. The *producer* generates a value every 100 milliseconds, the filter processes a value every 500 milliseconds and the *consumer* continuously reads values at the rate of 1 every 200 milliseconds.

**Question 2**

A LatchBarrier is a control that forces *N* threads to rendezvous at a given point. When all threads reach the barrier then they are all released. The threads are automatically released by the barrier when the *Nth* thread invokes the public method waitBarrier on the barrier. This LatchBarrier has no reset method and, hence, once it releases threads it no longer works as a barrier. Note the class only has a constructor that takes *N* as argument and a waitBarrier method. Using condition variables write a class that implements such a barrier and test it.