Classic Concurrency Problems

Mutual Exclusion

How do we stop more than one thread accessing a variable at the same time?

e.g. int count=0

We want (or more) threads to use this variable but make sure only one can assign it a new value at a time

Show how this can be achieved using a semaphore

Do it now!

Multiplex

Generalise mutual exclusion solution to allow a maximum of N threads access a critical section

Critical section is a block of code that we need to restrict concurrent access to

Barrier

Rendezvous only works for two threads

A barrier works for N threads

When first N-1 threads arrive at barrier they are blocked

When the Nth thread arrives they all continue

Barrier Hints

We will need to keep track of the number of threads who have reached the barrier

This counter will be shared by all threads