DESIGN & NOTES:

Request – struct defining a request

BoundedBuffer – A list of requests, with a max size. Producers add to tail and consumers remove from head.

ProducerConsumer - Threads are created (1 producer and N consumers). These threads share a mutex lock that controls access to the bounded buffer, ensuring no two consumers remove the same request. Cases of spin wait and deadlock are prevented by the use of two condition variables. One variable (fullBuffer) is waited in by the producer in the event that the buffer is full. The consumers signal that variable when they consume a request. The second condition variable (emptyBuffer) is waited on by a consumer in the event that the buffer is empty. When the producer produces a new request, it signals the variable after releasing the lock.

Arguments: 1 = max random sleep time for producer, 2 = number of consumers, 3 = max request length. The size of the buffer can also be specified by changing #define BUFFER_SIZE .

INSTRUCTIONS:

Compile c files with make clean, then make, and run ProducerConsumer with argument variables specified above.