ASSIGNMENT 5 Zachary Scott

BOOK-ORDER-SYSTEM

This program makes use of several applications of the p_thread library including a **mutex** and on **condition variable**.

The mutex is applied to all queue structs (implemented as a linked-list), preventing concurrent access from multiple consumer threads.

The condition variable is called **NOTempty**, which indicates that a producer cycle has completed as there is at least one order in the main order-queue.

The producer method is completed by a single thread looping through all the orders in the order input file.

The consumer method is entered by as many threads as there are categories, allowing each thread to take care of a certain type of order.

Upon entering the consumer function, the thread checks if **NOTempty** is flagged, checks if the queue has something in it, and checks if the current order pertains to it's category. If all of these conditions are met, the thread grabs the mutex, processes the order, and unlocks it upon completion. If not, the thread will be suspended until a cond_broadcast wakes it up and it checks the processing conditions again.