

CSCI 4060U – Laboratory #7
Simulating a Stock Exchange with Pthreads in C
Lab Due: 11:00pm Monday, March 17, 2025 (Canvas)

Introduction

The main purpose of this lab is to create a program that simulates a stock exchange system. Your program will be written in C and use the `pthread.h` library (including mutexes and condition variables). You will start the lab by familiarizing yourself with the partially implemented solution in `pthread_lab7_start.c`.

Activity #1

In this activity, implement the missing part of the function `update_stock` in `pthread_lab7_start.c`. Specifically, if the `change` parameter is zero then this function adjusts the price of stock index `id` by `price_var` and sends a signal that the stock price has been changed. The function should also print out a message like: **Stock price of A: \$5.43**

Activity #2

In the second activity, you should focus your attention on the `stock_broker` function and again implement the missing part. Specifically, when signaled that a given stock price has changed, this function should assess if a stock purchase or sale is required and proceed with the purchase or sale assuming that the current stock price is desirable.

Activity #3

In the final activity, you will increase the parallelism in the stock exchange simulation by creating multiple stock broker threads. Each stock broker should have different criteria for the purchase and sale of the various stocks.

Marking Scheme

Activity #1: <code>update_stock</code> function	3 marks
Activity #2: <code>stock_broker</code> function	3 marks
Activity #3: multiple stock brokers	3 marks
Commented code	1 mark
TOTAL	10 MARKS

Submission

You should submit your commented source file through the lab drop box in Canvas.