Objectives:

This programming assignment is intended to give us experience in developing multithreaded programs that require thread synchronization and deadlock prevention.

In this assignment, we were required to write a C/C++ program, called a4tasks, that utilizes pthreads to simulate the concurrent execution of a set of tasks. The system has a number of resource types, and each resource type has a number of available units. All resource units in the system are non-sharable non-preemptable resources.

Building the program:

Change directory to the folder
Run command: make

Running the program:

% a4tasks inputFile monitorTime NITER

Design Overview:

For this assignment, multiple classes were created to encapsulate the logic and provide suitable abstractions. The main classes are AsynchronousTask, Resource, TaskDepot and ResourceDepot.

Project Status:

The project runs properly on normal input files. However, the program parsing can't currently handle input files with more than one space between arguments.

Testing and Results:

The program was tested using normal inputs and sample input files provided in the project description.

Acknowledgments:

The race condition files were used to draw references for thread creation, timing and joining.