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CS266: Lab Exam - Section 1

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Problem 1

Create a multithreaded program to implement the Banker's algorithm. There are N customers (threads, minimum 5) who will request for M resource types (minimum 3 types). The banker will grant a request only if it leaves the system in safe state. A request that leaves the system in an unsafe state will be denied.

A customers' request for resources will be bounded by their respective values in the *need* array. Function prototypes for requesting and releasing resources are as follows:

    int request_resources(int customer_id, int request[ ]);

    int release_resources(int customer_id, int release[ ]);

These two functions should return 0 if successful (the request has been granted) and −1 if unsuccessful. Since multiple threads (customers) will concurrently access shared data through these two functions, therefore access must be controlled through mutex or semaphore using Pthreads.

You should invoke your program by passing the number of resources of each type on the command line like

    ./202051001.out 5 7 12

Make sure your program is properly commented for understanding and reading purposes.