Operating Systems 1 – 3rd year
Dr. Khalid Wassif
Fall 2017

Assignment # 2

Java Synchronization & Threading

It is required to simulate a restaurant program using Java threading and semaphore

Description:
The restaurant should be designed to have n tables, only one customer can be seated on a single table at a time validating the following rules.

- The restaurant is initially empty (i.e., no waiting nor eating customers).
- If a customer arrives (print a message that a customer has arrived) and if a free table exists, the customer should
    - Sit down
    - Order food.
    - Eat
    - Leave

Note: these actions will be represented by printed messages, such that there is a random waiting time between the printed messages when a customer arrives, orders, eats and leaves.

- If a customer arrives and all tables are occupied, he must wait until one of the currently available customers finish eating and leave.
- After finishing his food, a customer leaves and one of the waiting customers (if exist) will enter.

Program Input:

- N: Number of tables inside the restaurant.
- TC: total number of customers with their names

Program Output:

The execution order of the Customer's threads and the printed messages of each Customer

Bonus (5 grades): Implement a GUI for your simulation

Example:

Inputs:

- What is number of Tables? 2

- Name of Customers : 4

- Customer's names: C1 C2 C3 C4

Output: (Note: output depends on the order of the executions of the threads)

- C1 arrived

- C2 arrived

- Table1: C1 Sit down

- Table2: C2 Sit down

- C4 arrived and waiting

- C3 arrived and waiting

- Table 1: C1 Order Food

- Table1: C1 Eat

-Table 2: C2 Order Food

-Table 1: C1 Leave

-Table1 : C4 Sit down

-Table2: C2 Eat

-Table1 : C4 Order Food

-Table2: C2 Leave

- Table2: C3 Sit down

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Submission instructions:

1. Submission deadline date is Saturday 28 October.
2. The assignment is submitted in groups of max. 3 students and min. of 2 students.
3. Discussions will be held in your lab slot in the week starting from 28 October.
4. All group members should understand the code delivered, anyone fails to answers will cause the whole group members to be deduced in grades