

Distributed Systems Programming (DSP620S)

Individual Assignment

Due on 10/09/2019

Problem 1.

Mark: 50

You have been tasked with the design and implementation of **kent**, a fully automated restaurant application. **kent** can make bookings, serve food and beverages and handle the payment.

A *client module* remotely invokes the **book** function, to enable a customer to make a booking. It takes the following arguments:

- date of the booking;
- preferred time;
- the number of guests;
- expected duration.

Note that the expected duration is an optional value. By default, a table will run for two hours. Once the booking completes, a (unique) *reference number* is generated and sent back to the *client module*. Furthermore, in case the place might be overbooked during on the day of visiting the restaurant, a customer can pay a deposit to secure the booked spot. Another remote function, **deposit** is used to this end. It takes the *reference number* just issued as well as given units of a virtual currency used in the system. The function returns a confirmation code, whether the deposit was accepted or not.

On the date and time indicated on the booking, the customer and his/her guests may present themselves at the physical address of the restaurant. Upon arrival, they provide the *reference number* and are introduced to a waiting area by a welcoming robot. If there is a table available, the guests are seated instantly. Otherwise, they join a waiting list sorted in order of the deposit paid during the booking.

Guests who have been assigned a table will have their information (e.g., *reference number*) transferred to the table. Each table is a fully automated robot that can interact with its guests. The guests can order food and beverages which are automatically transferred to the bar and kitchen and delivered when ready by waiter robots. Once the guests are done, they can generate their bill, complete the payment and have a receipt issued to them to allow them through the door.

Your task is to design and implement `kent` in *ballerina*. You will use `gRPC` for the booking part and implement the *client module* and the remote object. As for the second part on the restaurant premises, you will use `Kafka` as middleware and implement all robots as services.

2. Submission Instructions

- This assignment is to be completed by groups of four (04) students each.
- You will submit your assignment in the folder named `DSP620S_2019_Assignment1` on the E-Learning platform.
- The submission date is Tuesday, September 10th 2019. No late submission will be accepted, and no other submission mode will be considered valid.
- Any student who fails to submit on time will be awarded the mark 0.
- Your submission should only contain the source code files and the additional resources needed to run your program.
- There should be no assumption about the execution environment of your code. It could be run using a specific framework or simply on the command line.
- In case of plagiarism, all submissions involved will be awarded the mark 0 and each student will receive a warning.