Assignment 1: Building a Chatbot using Microservices as Back-end

Submission Due Date: Monday 1st of April 11:59pm

Late penalty: 20 percent of the final mark per day

The weight for this Assignment: 15% of the total course mark.

Business Scenario

In this assignment, you are to implement a Chatbot that rely on a set of REST API based Microservices to perform booking in a dental clinic using any messaging platform (you prefer).

First, let us imagine that the appointment booking operation in the dental clinic is based on the following workflow (modelled as state machines).

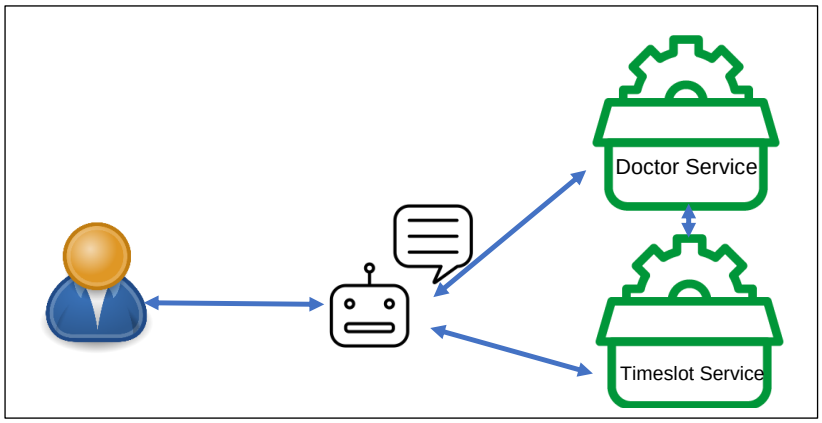
The scenario here is the patient contact the Chatbot to request for a booking. If the patient needs to specify the doctor or ask for the list of doctors available. After the selection of the dentist the patient needs to specify the preferred timeslot the bot check if the timeslot is available and if not, provide list of available timeslots. The patient will select the timeslot available and the booking is made.

The assumption that we have at least three dentists. They are available from 9AM-5PM every day. Each dentist by nature has a timetable.

The specification are deliberately left open to allow students to take follow their own strategy to achieve the required outcome.

API Implementation (8 Marks)

The system overview



The diagram above shows the high level components of the system you are building. The dentist and Timeslot services are to be deployed in a docker container and the Bot should communicate with the services through REST API calls. .

To summarise the main functionalities:

- Get available dentists
- Get dentist information
- Get available timeslots for each dentist
- Reserve timeslot
- Cancelling appointment

The following describes the API you should implement.

The resources and their URI patterns:

There are two types of resources to be managed: Dentist and Timeslot. It is up to you to design these resources and their URI patterns. Indeed, this will be your first task. Go through the scenario and make sure that you have every piece of data needed to service the scenario is covered.

Some suggested information for each resource:

- Dentist: name, location, specialization (e.g., Paediatric Dentistry, Orthodontics, Oral Surgery…etc.)
- Timeslots: Date, 1 hour timeslots from 9:00 AM to 5:00 PM, status flag (reserved, available)

Managing resources:

It is important that all HTTP methods implemented by you satisfy the safety and idempotency properties of REST operations. It is also important that the design of the API allow stateless communications.

It is part of your design task to choose an appropriate HTTP method to implement the following management operations.

Persisting resources:

Ideally, you would like to store these data in a persisting data source. You need to respect the concept of isolation in Microservice architecture. The form and type of data is up to the students to decide.

RESTful APIs are stateless:

Your implementation of APIs should show that your APIs are stateless (i.e., you do not store any specific information about a particular client) and all communications are self-contained with the messages.

Bot Interaction (4 Marks)

There is no special requirement which chatbot or messaging platform to use but here are some general guidelines you need to follow.

- The bot should be able to respond to basic greetings
- The bot asks the client for the preferred doctor and provide information about the doctor
- The bot can list all the available doctors in the clinic and the client can choose
- The bot can check if the selected timeslot is already reserved and suggest another timeslot
- The bot can provide a list of available timeslots for the selected doctor
- The bot can confirm the booking and summarize at the end.
- The bot can cancel the booking if the client requested it and ask for confirmation.

Documentation (3 Marks)

Provide some deployment instructions in a form of PDF file.

Use Swagger to document all of your endpoints and their sample input and output. This is important for the tutors to mark your assignment correctly.

Bonus (1 Mark)

Do one of the following (be advised if you do both you will still get only one bonus mark but you'll benefit from the learning experience)

1. Add authentication service (e.g., using JWT)
2. Visualize some of the information provided (e.g., display the timeslots graphically).

Submission and Marking scheme

Submission is through WebCMS3 Dropbox file request link .

submit files to https://www.dropbox.com/request/YPRT2usu45zLKR6cGR...

As first name input your zID and for Last name input your full name (First and Last as in University records)

A detailed instruction and marking guide will be given soon.

More details to be released in due course.