Databases 2018-30. Coding Project

INTRODUCTION

Millions of companies deliver their services and products only through the Internet, and their business model is so successful they opened a new service to which developers can connect. An example of such a company is Expedia Group, which the creators founded in 1996 and is a U.S. global travel technology company[1]. Its websites, which are primarily travel fare aggregators and travel metasearch engines, include http://www.Expedia.com, http://www.hotels.com, http://www.trivago.com, http://www.travelocity.com, http://www.orbitz.com, among others.

You will create your own site that, somehow, competes with Expedia Group. This project needs to focus only on the back-end of the application, because another developer will develop the front-end of the completely new site. Now, an Indian venture capitalist company funded you, so they want to test your skills before handing you the project. These companies use a technology named REST to create the API that other companies can use. You are only interested on building a RESTful API with a minimal interface (some specific functionalities will ask you to do it). These APIs offer functionalities through multiple services. Each service is available through an URL as interface, which expects a number of parameters, which might differ depending on the service.

YOUR PRECISE TASK

You have to develop a very simple site resembling the Expedia Group API (of course a prototype of it), which documents all the calls developers can make to your API, and explains with two simple use cases how to call it. Please go to their website for more reference: https://hackathon.expedia.com/docs/. The following are the list of required functionalities:

Specific open functionalities:

1. Search by several criteria, including: hotel name, state, hotel type, and size (please use the following criteria for grouping hotels by number of rooms: 10 to 50 rooms is a small hotel, 51 to 100 rooms is a medium size hotel, and more than 100 rooms is a large hotel).
2. Search for hotels given a location (latitude and longitude) and a range.
3. Check for availability in hotels, given a start date, final date, and a state.
4. User creation, given: email, password, name, last name, address, and it must return the new user ID.
5. User update, given: user ID, password, address, and it must return 1 if successful, 0 if not, and a reason.
6. Reserve rooms (could be more than one), given a hotel ID, user ID, a start and final date. The service must check availability before reserving. It must return the reservation ID.
7. Create a new API key. This service expects as parameters contact name, company and email. The site will generate a random API key that users must use to call certain parts of the API. In a real scenario, Expedia would not generate API keys for just any user without restrictions.

[1] Expedia Group. URL: https://en.wikipedia.org/wiki/Expedia_Group

Functionalities protected by the use of an API key:

8. Post a new hotel to the database. For this, please consider the following options: posting all the fields or posting only name, address, type of hotel, number of rooms, and state. The service expects an API key to call this service.
9. Update a hotel of the database. For this, only the following columns are updatable (and all parameters are expected: hotel type, number of rooms, phone number, website, and contact email.
10. Delete a hotel from the database. The service needs the API key, plus the hotel ID to delete a hotel.

All the services must return JSON as response.

Deliverables and Dates

You can work on this project with groups of maximum three (3) students. There will be no group of four (4) students, so do not even suggest the idea. The group must deliver the following files by **Sunday, October 14th, 2018**, at 11:59 PM through a link that will be available at the class' website.

- Database design: you can do it on a tool such as Enterprise Architect, Vertabelo http://www.vertabelo.com, or explore alternative tools, and then export it as an image file.
- Source code zipped in a single file with a short 1-page manual about how to configure it if I would like to run it locally.
- Database dump. You need to generate the script to recreate your database so it can be easily exported to another database server (for example from your SQL Server to my SQL Server).

Grading

The following are the components of your grade.

- Creating your group, and posting in the discussion group on Blackboard the names of the students and the technology you will be using (**by Sunday September 9th, 2018 11:59 PM**): 5%
- Database design: 15%
- Functionalities 1 through 5: 30%
- Functionalities 6 through 10: 35%
- API documentation (it must be a URL in your site): 10%
- Importing the adjunct Excel file with sample Indian hotels into the database plus adding location information using Google service: 5%

Notes:

- The professor will not assign extra time for this project, please start creating your group soon or you will end up in a couple. Do not start late because you will end up: making a lousy work, asking for more time, and crying at the end.
- The students can develop the project using any of the following database engines: MySQL, SQL Server, and MongoDB. You can code on any programming language, but the following are recommended: PHP, C#; Java.

- You must import the Excel file to the database, I encourage you to export the file into CSV, but some database engines might accept Excel files. Please be aware that some values are missing so some columns must accept nulls.

Location Generation Example

You will use a Google's service to retrieve a hotel's location based on the address to complete the information about the sample hotels in the Excel fill attached to this document. The address with an example is as follows:

http://maps.googleapis.com/maps/api/geocode/json?address=20/1100Beach%20Road,%20Alleppey%20West%20-%20688%20012,%20KERALA

The previous API call will return a JSON with certain information, including the location of the hotel; response can also be in XML.