Developers test

# Programming

I’ve choose **MySQL** data engine for this project, due besides of I’m in the habit to use that, it’s likely the most extended database engine and it’s a good choice for this kind of project of a dynamic web application. This is the database model to perform the basic case of booking a room:

BOOKING

**Idr (FK room.id)**

**Idc (FK customer.id)**

Datetime

Accepted

Payed

....

ROOM

**Id (PK)**

**Idr (IND idroom)**

**Idh (IND idroom)**

Floor

Door

...

HOTEL

**Id (PK)**

Name

Location

....

CUSTOMER

**Id (PK)**

Name

Surname

....

DATABASE MODEL

Regarding to the MVC framework, I can’t send you the code of that, due I have my own framework and it’s protected by author rights (me), due I spend a lot of hours to code it and I can’t send you if I’m not contracted to your company, but I can show you an simplified explain about how it works in the requested project of booking case:

VIEWER

* **Constructor**: Non required
* **Method called**: Return a string variable of returned html code depending the input arguments.

CONTROLLER

* Constructor: Initializes Viewer, Template and DataBase properties as objects to the main classes (by default, the loaded viewer match with the <CONTR>View-><ACTION>() request action. Also loads default template as /tpl/<CONTR>/<ACTION>.tpl file.
* **Method called**: Checks session data if required and high level permissions to use it. Optionally, calls the View class to get rendered data in html format to fill template variable as parts of code. Finally, returns the replaced template result as a single string (or throws an exception if error happens).

ROUTER

* Gets the url request. Detects the QS action parameter formed as <CONTR>/<ACTION> string
* Calls to the <CONTR>Controller-><ACTION>() class
* Plots the returned string in last calling method (or catch exception object to print an error).

MVC MODEL (BASIC)

Regarding to the view used, I use smarty template, due it’s very dynamical, it allows you to use iterators and conditionals and it’s very easy to implements and converts from the html template to the tpl format. Also, has a very active community and is very used in a lot of php projects around the world.

The views used to perform a booking are:

* View for list of available hotels of the customer selected zone and/or selected datetime.
* View for details of rooms in the hotel selected by the customer
* View for summary of selection room and additional services
* View for payment process
* View for final summary of the booking operation

The CRUD implementation is in php hardcoded language in GitHub.

It uses my own hand-made MVC framework for several reasons:

* I understand how it works 100% from top to bottom
* Includes a log system quite powerful similar to logCat in eclipse from Android developers
* It’s optimized for MySQL engine using mysqli libraries and uses and Smarty template system
* Allows multilanguage system using several ways to locating translation depending on the customer
* It’s in constant development and will include a shell interface to perform several operations like html generation from template and variable assignment by terminal prompt.

## Web searches to do this part

* CRUD: Create, Read, Update and Delete, searched in Google and referenced to Wikipedia (http://es.wikipedia.org/wiki/CRUD)

# Sql and data layer

[File with sql definition and sql queries are in **database.mysql.sql** file in root Git repository]

## Web searches to do this part

* MySql tutorials for query data definition statements (<http://dev.mysql.com>)
* How to store Geo coordinates in Mysql. Stackoverflow question (http://stackoverflow.com/questions/15886158/mysql-using-float-data-type-to-store-geographic-coordinates)

# General

1. Define using your own words the next concepts in 2 lines:

You have a live server behaving strange, you don’t know what is happening but the requests are not responding. You see the number of apache threads increase until the server crashes. How would you start investigating this issue? What is the test plan?

SOLUTION: Use **netstat** command to detect opening connections to see if it’s a too many connections at same time or is due a script timeout problem. Take the appropriate solution depending of the problem. Test plan is to kill the connections and check the code executed to simulate the block and detects the main root of the fail (a server excessive connections or an excessive time execution process for each http request)

1. Difference between Unit Test , Integration test and Acceptance test

SOLUTION: Unit test it uses small modules to perform the test, then integration test, uses groups of modules to perform more complex operations, and finally acceptance test is used to verify the app specificaitons.

WEB SOURCE USED: Wikipedia (http://en.wikipedia.org)

1. What is a mock and how would you create them in PHP.

SOLUTION: Mock objects are simulated objects that mimic the behavior of real objects in controlled ways. I can create one in php by throwing several calls to method classes by using by examples a foreach iterator over a hash array with each value represents a different type of value applied to the method arguments, with real-simulation values.

WEB SOURCE USED: Wikipedia (http://en.wikipedia.org/wiki/Mock\_object)

1. You need to design a storage architecture for php sessions that provides high scalability, failover, and high performance. What would you do?

SOLUTION: I’m not an expert in this theme, but I’d try to use the powerful of mysql to manage the session data

1. JSON vs XML. When / Why would you use instead of the other?

SOLUTION: I’ll use JSON data for data transaction via web callings (for example to create a web service that communicate only using json ask and response strings). This is better for me due json is “lighter” than an xml document. I’d use xml for create a well-structured portion of code where the data stored is more complex than json data to read it.

1. If you are using mysql command “explain”, what do you look at to know if you must optimize a query

SOLUTION: I think you should block the nested join by using STRAIGHT\_JOIN keyword after the SELECT keyword.

WEB SOURCE: mysql tutorial (http://dev.mysql.com/doc/refman/5.5/en/using-explain.html)

1. What advantages provides the usage of traits?

SOLUTION: To code reuse in single inheritance to reduce some limitations of single inheritance by enabling a developer to reuse sets of methods freely in several independent classes.

WEB SOURCE: Php manual (http://php.net/manual/es/language.oop5.traits.php)

1. What is the benefit of using NameSpaces?

SOLUTION: Reducing a lot of typing by renaming classes due you can encapsulate some classes about a similar purpose and will not collide with other classes that has the same name. In addition you’ll can create alias classes to shorten long names, improving readability of source code.

WEB SOURCE: Php manual (http://php.net/manual/en/language.namespaces.rationale.php)

1. RESTful interface vs SOAP. Benefits of each option

SOLUTION: If the web service is not yours, you must use the required interface of it. SOAP is transport independent, standardized while REST is easier to use and more flexible.

WEB SOURCE: http://blog.smartbear.com/apis/understanding-soap-and-rest-basics/

1. What is dependency injection about? What are some of the key benefits of using it?

SOLUTION: A software design pattern that allows a program design to follow the dependency inversion principle. This means that a service is made part of the client’s state. The main benefit is that the client doesn’t needs to find or build the service.

WEB SOURCE: Wikipedia (http://en.wikipedia.org/wiki/Dependency\_injection)

# Problem solving

[You’ll see the program in root Git repository. Shell executable php file is **cmd\_parenthesis.php** and class definition is **StringCheck.class.php**.]