Assessment Test

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| First name: | Roy | Date of submission: | 28-01-2015 |
| Last name: | Taza | Time to complete (hrs): | 12.45am |
| Educational Institution: | Universidad Peruana de Ciencias Aplicadas | Hrs. avail. per week |  |
|  |  | Score: |  |

## Introduction

The purpose of this test is to evaluate the applicant's technical knowledge for the position and his talent to face new challenges.

Unlike many tests, this assessment looks to replicate how real life is in the IT industry: The ability to find solutions and answers in a reasonable time period.

So we do not expect that the applicant masters all the fields the questions are related to, but the applicant's ability to do research, ask the right persons and come up with a solution.

But we recommend the applicant not to answer questions that he don't understand with all the background he already has. So having strong theory and knowledge in Software Development is a must.

## Rules and Recommendations

These are the **rules** to follow to be able to qualify for the test:

- Submit the completed Assessment Test before the deadline (see Test Duration)

- Complete every answer with an explanation.

- Document code when applies.

**Recommendations**:

- Complete the test in English. It is not mandatory but it will definitely add value to the application.

- Propose more than one solutions when possible, and explain why each one has its one merits.

- Use Google, books or any other source to answer the test. In any case, the applicant should explain and demonstrate that he understands the question and answers provided.

## Methodology

After being contacted by the recruiter, the applicant should receive an email with this test. If you have any question about the test, please contact the recruiter.

The applicant should submit the completed test by email with any attachment that he might consider appropriate.

The applicants who passes the assessment will be contacted by a recruiter to arrange an interview. In that interview we will validate that the applicant actually completed the assessment by himself and we will also check the English level.

## Test Duration

The applicant has **3 days** to complete the test from the moment he received the call from the recruiter explaining the test. The deadline is at 12am GMT+5. For the person who has knowledge in all these areas, the full exam can be answered in less than 2 hours.

## Questions

For all the test's purposes, the programming language to use is PHP. It is recommended to provide a link where the code can be tested. Bonus questions are optional but will help compensate when other questions can't be answered.

## PHP

Answer the following questions:

a. What command do you use to output data when you are testing functionality:

b. Using a PHP function if it exists or by creating a custom function, convert a string such as "red, green, yellow, blue" into an array like this: array(0=>"red", 1=>"green", 2=>"yellow", 3=>"blue")

$colorString = "red, green, yellow, blue";

$colorArray = preg\_split("/[\s,]+/", $colorString);

print\_r($colorArray);

c. From the previous array, extract the 2nd element into a variable so the array is left with only 3 elements.

$extractedElement = $colorArray[1];

unset($colorArray[1]);

print\_r($extractedElement . PHP\_EOL);

print\_r($colorArray);

d. Merge the array with a similar one but with the colors in Spanish

$spanishColorArray = array("rojo", "amarillo", "azul");

print\_r(array\_merge($colorArray,$spanishColorArray));

**Bonus:** Create a function that receives the 2 previously created arrays and merge them into an new array like this: array("red" => "rojo", "yellow" => "amarillo", "blue" => "azul")

print\_r(array\_combine($colorArray,$spanishColorArray));

## Algorithms

Using PHP, create a method that transforms an $arrayA into a where clause from a SQL statement

called $stringB. In the example, S, N and B represent String, Number and Binary types.

$array A => **array**(

// Associative array of custom 'AttributeName' key names

'AttributeName1'=> **array**(

'AttributeValueList' => **array**(

**array**(

'S' => 'Value1',

'N' => 'string',

'B' => 'string',

'NULL' => **true** || **false**,

'BOOL' => **true** || **false**,

),

),

// ComparisonOperator is required

'ComparisonOperator' => 'string',

),

// ... repeated

$string A => 'WHERE AttributeName1 ComparisonOperator1 Value1 AND AttributeName2 ComparisonOperator1 Value2**..."**

**Bonus:** Create and algorithm to do the opposite: Transform a where clause into an array.

## UI

Create a webpage with HTML, CSS and Javascript/JQuery that presents:

- A header of 100px high always at the top of the page with any size of window.

- A footer of a 80px high always at the bottom of the page with any size of window.

- The main page or container is 100% the width of the window and up to 1200px maximum. After that it keeps 1200px width but centered in the browser window.

- Use different colors for each section.

**Bonus:** Add a navigation menu using Twitter Bootstrap. The content to the menu is up to you.

<html>

<head>

<style>

html,body {

margin:0;

padding:0;

height:100%;

}

#wrapper {

min-height:100%;

position:relative;

}

#header {

background: blue;

padding:100px;

}

#content {

background: gray;

padding-bottom:80px;

min-height: 5px;

width: 100%;

max-width: 1200px;

margin: auto;

}

#footer {

background: green;

width:100%;

height:80px;

position:absolute;

bottom:0;

left:0;

}

</style>

</head>

<body>

<div id="wrapper">

<div id="header">

</div>

<div id="content">

</div>

<div id="footer">

</div>

</div>

</body>

</html>

## Object Oriented Programming

a. Create a class that handles Command that inherits from the BasicCommand class. Propose any attribute you want. In the constructor, make sure you invoke the parent's constructor. Explain why inheritance is useful and why not use interfaces.

b. Create a class that handles Events that implements a BasicEvent Interface that has 2 methods: register and boot. Implement both method with any code you like. Explain why interfaces are useful and why not use inheritance.

c. Create a trait called SoftDeleting, with a delete method and use it in the previous 2 classes. Explain why traits are useful.

**Bonus:** Create a static method in the Command class that creates a new Event.

## Relational Databases

a. Create a database schema that support ACL functionality with these characteristics:

- I want to support User, Roles and Groups

- A user can have multiple Roles and belong to many Groups

- A Role can be assigned to several Users.

- A Group can be composed by any number of Users

- I want to control access to menu options for an application that can have any number of menus.

b. Given a table Users and Roles, provide the SQL statement that get the list of all Users that don't have an specific Role ABC but belong to a Group XYZ.

Select \*

From User u join UserXRole uxr on u.idUser = uxr.idUser

join Role r on r.idRole = uxr.idRole

join UserXGroup uxg on u.idUser = uxg.idUser

join Group g on g.idGroup = uxg.idGroup

Where r.roleName != “ABC” and g.groupName = “XYZ”

c. What are transactions? Why are they important?

The transactions are a set of operation that are executed like an only one block, it means, if an operation fails, all the operations of the transaction too. If a transaction has success, the modifications are confirmed and saved permanently in the database.

Transactions are important because they allow to make safe operations, avoiding losing important data.

**Bonus:** For question a, add support for access to specific links not accessible from menus.

## Document versioning

a. What tools have you used for control versioning. Have you used GIT?

I´ve used Git and I have my account in GitHub.com: RoyTR. I have contribuited to some repositories like PeruRetouchProject and MatriculaFacil.

b. Using GIT, how do you connect your local repository with your remote repository in Github

Following the next steps if the project is new:

$ git init

$ git add .

$ git commit –m “Commit comment”

$ git remote add origin *gitRepositoryUrl*

$ git push origin master

*remote name : branch*

Adding a new file to commit:

$ git add .

$ git commit –m “Commit comment”

$ git push origin master

c. Using GIT, how do you rollback the last commit you did in your local repository?

$ git reset --soft HEAD~1

d. Using GIT, how do you avoid adding to the repository specific files like public images or so?

I avoid adding to the repository specific files using .gitignore file. This file contains folders and files extensions that will be ignored to commits.

**Bonus:** Create a public Github account and push all the answers into a repository. Provide the link to review the code. If you are familiar with Bitbucket, you can work with that service instead.

<https://github.com/RoyTR/AssessmentTest.git>

## MVC

- Explain the benefits of using an MVC approach. Mention any limitation or drawback.

- Mention all the MVC frameworks used in the past, if any.

**Bonus.** Research the 4 most popular MVC frameworks available today and make a comparison analysis.

## Project Management

- What is Agile Scrum. Have you used it in the past? How is it different in comparison with Waterfall methodology.

- What are the roles for Agile Scrum? What are their responsibilities?. What role will you be assigned as Software Developer?

- What reports/tools do we have available to analyze the project progress? Explain.

**Bonus.** Research the 4 most popular Agile Scrum tools available today and make a comparison analysis.

## NoSQL Databases

a. Why NoSQL are important? What are the differences with Relational Databases?

b. How would you protect your application so you avoid developers mistakenly updating data using wrong attribute names/types?

c. Create a NoSQL Schema for question 5.5. a, using DynamoDB.

**Bonus.** What means Horizontally Scaling and why is important?

## Behavioral Questions

In this section, there is not right or wrong answer. The goal of this is to know how would you approach real life scenarios. You can choose multiple answers (specify sequence when applies).

1. You are working on a functionality you are assigned. You have several questions, so you:

a).  Call your manager to ask all the questions you have

b).  Send an email to your manager to ask for a meeting to solve all your questions

c).  Read all the documentation you a have been provided to look for answers

d).  Contact a peer/team member to ask questions

e).  Wait until the next programmed meeting to avoid interrupting others.

2. You are asked to code some task that is new to you, so you:

a).  Start from scratch to avoid wasting time doing research

b).  Tell your manager you are not the best person to code the task

c).  Ask all the team members for any advice to reuse code

d).  Go to Google and start searching for the best solution available

e).  Ask you manager for more time or to postpone the task.

3. You know that an estimation for one of your tasks is probably wrong, so you:

a).  Report immediately in the next meeting about this and propose a new estimation

b).  Try to do your best to complete the task in that time, to avoid the inconvenience

c).  Ask for help from other team members to finish your task

d).  Work hard, doing extra-time to complete the task

e).  Request the manager to reassign the task to a team member with more knowledge

4. You are asked for help from other team member, so you:

a).  Ask the team member for a time later during the day to talk about the issue

b).  Immediately leave all your tasks on hold and try to provided help as soon as possible

c).  Tell him you are busy and that he should contact the manager for help

d).  Help your peer but ask the manager for more time to compensate for your help

e).  Guide your peer through some guidelines so he can find the answer by himself

5. You are coding a functionality and while examining the available solutions, you:

a).  Choose the fastest solution so you can do some catch up with other activities

b).  Choose the best solution available

c).  Talk about the options available in your next meeting to ask for suggestions

d).  Choose the best solution for the project in terms of flexibility and maintenance cost

e).  Choose the best solution that you can deliver in the time assigned for the task

**THANK YOU FOR YOUR TIME!**