



Practical Assessment

This practical assessment aims at testing your skills as well as attention to detail when presented with a problem requiring a web application, SQL within a relational database and, or a mobile app. Such skills are critical for the desired candidate.

INSTRUCTIONS:

1. The Web “Clocking” Application (pages 2 – 10) is mandatory
2. The SQL Query (pages 11 – 12) is mandatory
3. The Mobile Apps (pages 13 – 15) is optional but will boost your score if you can attempt it.
4. Clarification may be sought before Friday, 3/Nov/16, 5:00PM (but not after)
5. All clarification must be sent by mail to info@trailanalytics.com
6. Submission deadline is Friday, 10/Nov/17, 11:30PM



Web “Clocking” Application

Consideration: 60%

Your client “Trail Analytics Limited” requires a simple web based application which will be used by staff to log their times of arrival and departure at office.

Trail Analytics has proceeded to provide the following interfaces which are to guide your implementation;

1. Login page

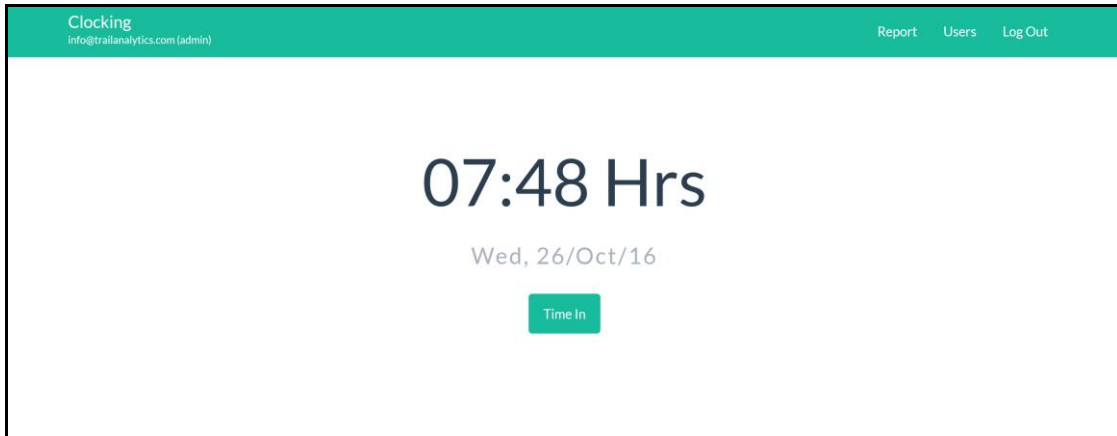
This is the page users will access when they visit the base URL e.g <http://www.application.com/>

A screenshot of a web form titled "Sign In". The form is contained within a light gray rounded rectangle. It features two input fields: the first is labeled "Email" and the second is empty. Below the input fields is a green button with the text "Login to Clocking". The entire form is centered within a white rectangular frame.

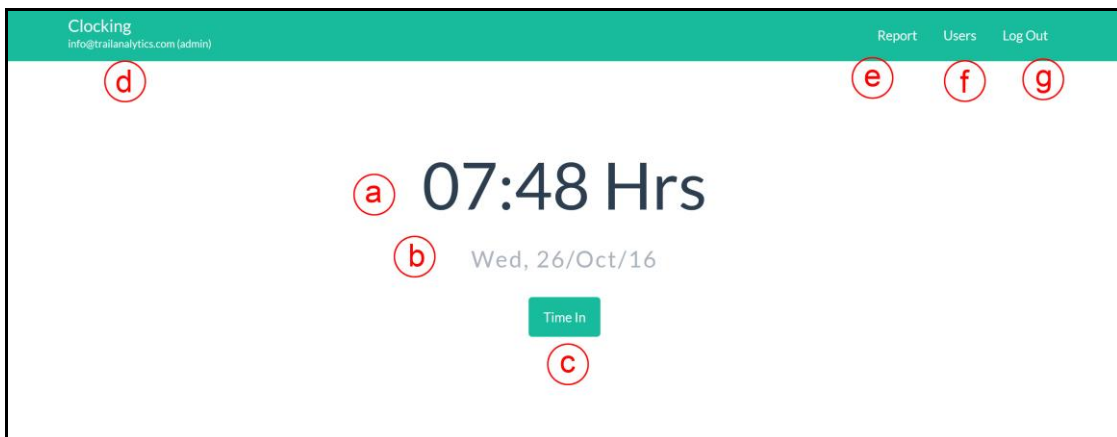
- a. **Note:** Form data from this interface must be submitted using the post method
- b. **Note:** Empty form fields should be declined preferably using server-side validation

2. Dashboard page

This is the page users will access when they have successfully logged in from the base URL in “1” above

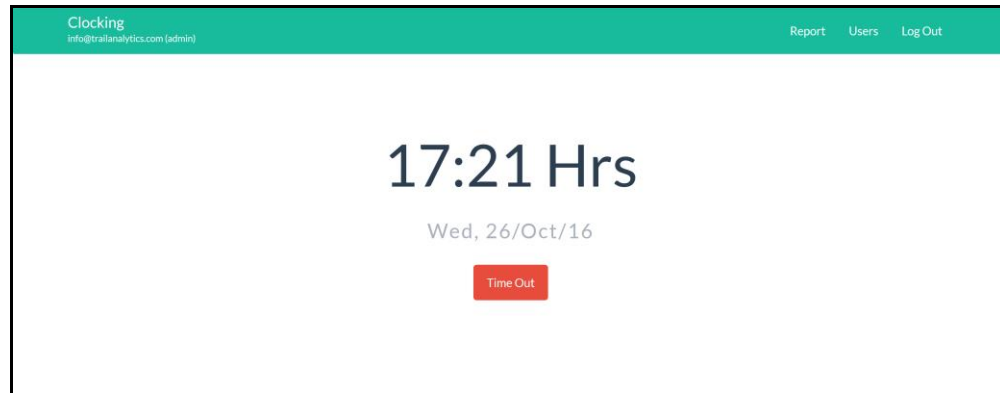


Technical details provided below



- a. Display the current time in 24 hrs
- b. Display the current date in the format outlined
- c. Clicking this button will log the current date and time to a database table thereby creating a record of the time at which the user arrived. Once the “TimeIn” has been logged, the interface will change to enable the user log the “TimeOut” at the end of the day

(consider the illustration below)



- d. Display the user's email address as well as the type of user i.e admin or user
The 2 main differences between a user of type admin and one of type user are as follows;
 - i. User type "admin" can create, modify or delete other users under the "Users" menu
 - ii. User type "admin" can view the "TimeIn" and "TimeOut" entries for other users under the "Report" menu
- e. Display the "Report" menu
- f. Display the "Users" menu (**Note:** the "Users" menu is only visible to users of type "admin")
- g. Display the "LogOut" menu

3. Report

This is the page users will access when they have successfully logged in and clicked the “Report” menu in “1. e” above

Clocking

info@trailanalytics.com (admin)

Report

Users

Log Out

Users

Admin

info@trailanalytics.com

Trail Support

support@trailanalytics.com

Logs for Oct, 2016

Date	Time In	Time Out
Sun, 23/Oct/2016	15:20:39 Hrs	16:33:20 Hrs
Sun, 23/Oct/2016	16:40:32 Hrs	16:40:43 Hrs
Sun, 23/Oct/2016	16:44:03 Hrs	16:44:20 Hrs
Mon, 24/Oct/2016	04:12:28 Hrs	04:12:59 Hrs
Mon, 24/Oct/2016	22:19:07 Hrs	22:19:42 Hrs

Technical details provided below

Clocking
info@trailanalytics.com [admin]

ReportUsersLog Out

Users

Admin
info@trailanalytics.com

Trail Support
support@trailanalytics.com

Logs for Oct, 2016

Date	Time In	Time Out
Sun, 23/Oct/2016	15:20:39 Hrs	16:33:20 Hrs
Sun, 23/Oct/2016	16:40:32 Hrs	16:40:43 Hrs
Sun, 23/Oct/2016	16:44:03 Hrs	16:44:20 Hrs
Mon, 24/Oct/2016	04:12:28 Hrs	04:12:59 Hrs
Mon, 24/Oct/2016	22:19:07 Hrs	22:19:42 Hrs

- Users of type “admin” will be able to view all other users while users of type “user” will only be able to view their logs

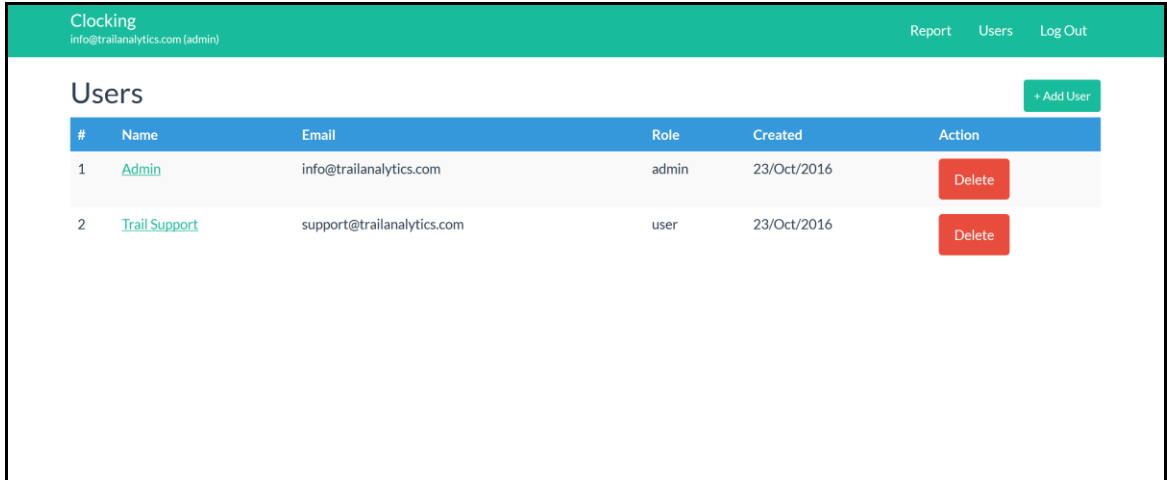
(example of a user of type “user” display is provided below).

Clocking			Report	Log Out
support@trailanalytics.com (user)				
Users		Logs for Oct, 2016		
Trail Support support@trailanalytics.com				
		Date	Time In	Time Out
		Sun, 23/Oct/2016	16:49:05 Hrs	16:49:32 Hrs

- b. Display the “TimeIn” and “TimeOut” logs in ascending order.
 (the logs displayed above are purely for illustrative purposes only)

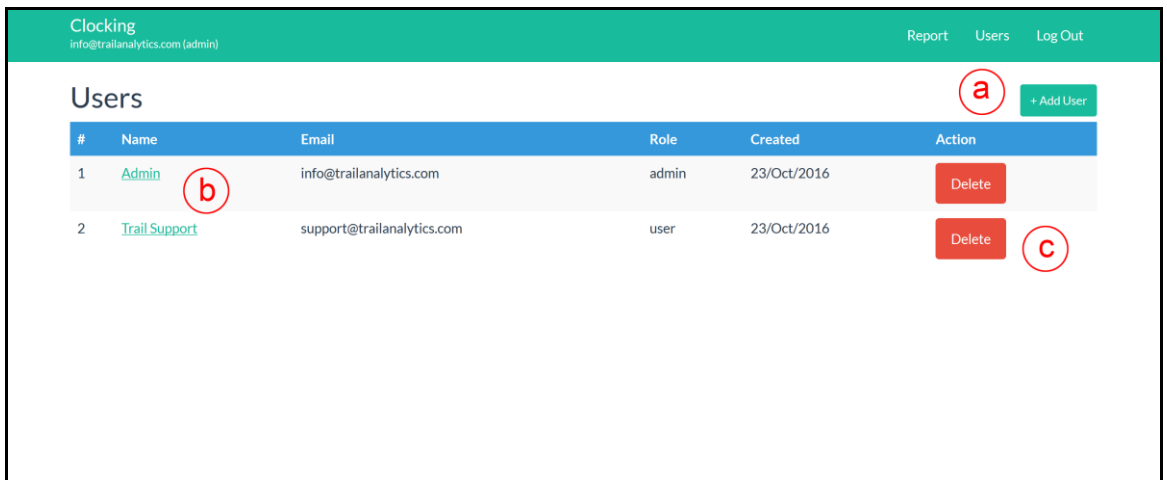
4. Users

This is the page admins will access when they have successfully logged in and clicked the “Users” menu in “1. f” above



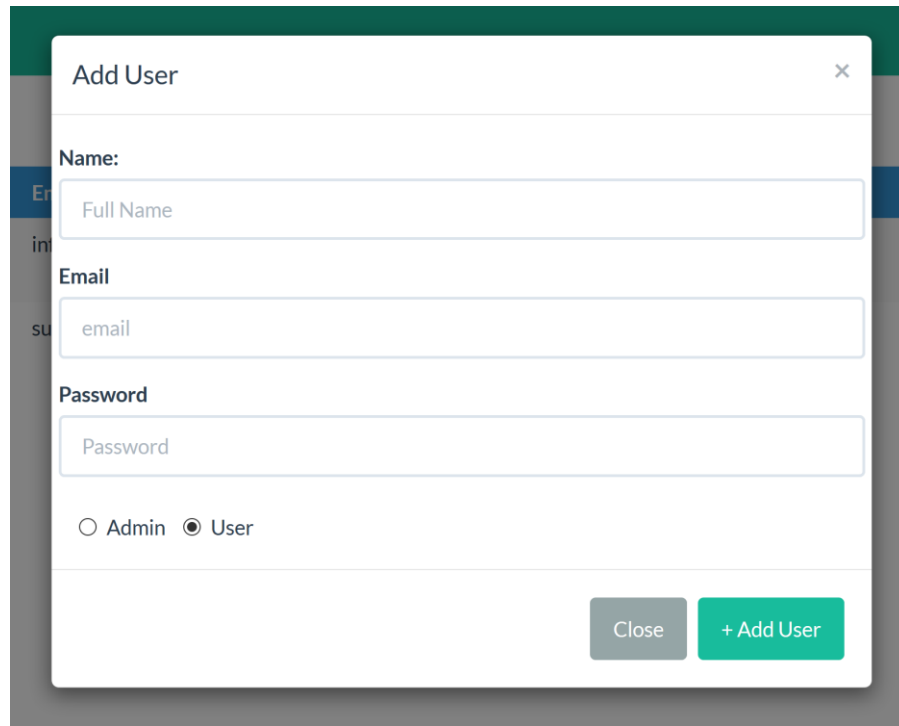
Clocking info@trailanalytics.com (admin)						Report	Users	Log Out
Users						+ Add User		
#	Name	Email	Role	Created	Action			
1	Admin	info@trailanalytics.com	admin	23/Oct/2016	Delete			
2	Trail Support	support@trailanalytics.com	user	23/Oct/2016	Delete			

Technical details provided below



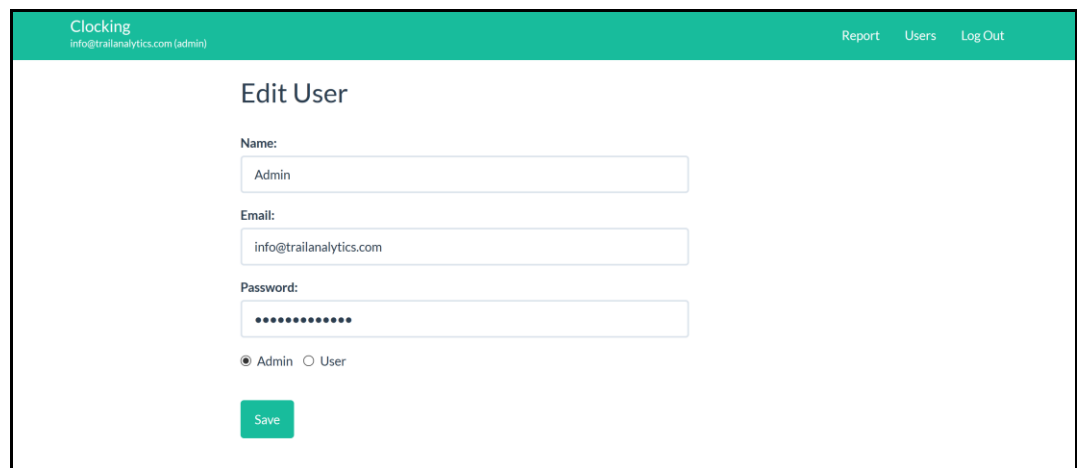
Clocking info@trailanalytics.com (admin)						Report	Users	Log Out
Users						+ Add User		
#	Name	Email	Role	Created	Action			
1	Admin	info@trailanalytics.com	admin	23/Oct/2016	Delete			
2	Trail Support	support@trailanalytics.com	user	23/Oct/2016	Delete			

- Clicking this link should return the dialog below into which new users' details shall be input



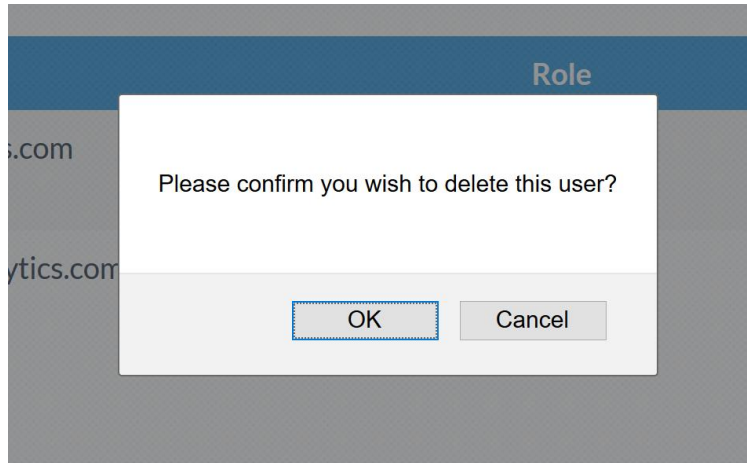
The image shows a modal window titled "Add User" with a close button (X) in the top right corner. The form contains three input fields: "Name:" with a placeholder "Full Name", "Email" with a placeholder "email", and "Password" with a placeholder "Password". Below these fields are two radio buttons: "Admin" and "User", with "User" being selected. At the bottom right of the modal are two buttons: "Close" and "+ Add User".

- b. The user's name should be clickable such that when clicked, the interface below is loaded enabling the editing of the user's details



The image shows a web interface for editing a user. The header is green and contains the text "Clocking" and "info@trailanalytics.com (admin)" on the left, and "Report", "Users", and "Log Out" on the right. The main content area is titled "Edit User". It contains three input fields: "Name:" with the value "Admin", "Email:" with the value "info@trailanalytics.com", and "Password:" with a masked password ".....". Below these fields are two radio buttons: "Admin" (selected) and "User". At the bottom is a green "Save" button.

- c. Clicking the “Delete” button should first prompt a user to confirm their actions before the request is executed



5. Logout

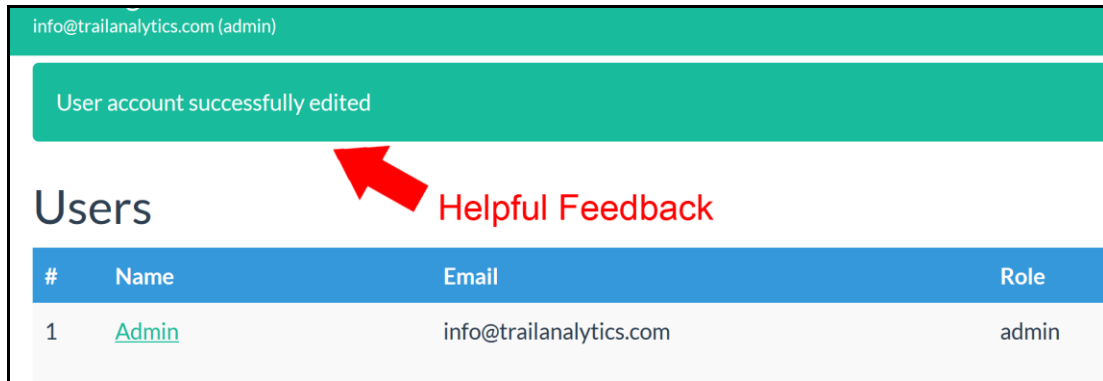
When clicked, this will end the user’s session returning them to the login page.

Note the following:

1. You are required to build this system using the PHP Laravel 5.2.x framework or later
2. You may use bootstrap css to quicken your implementation
3. You may download additional laravel components/modules to quicken your implementation and, or add additional features to your final application
4. Use Laravel’s middleware functionality to restrict access to features accessible to only users of type “admin”
5. Use Laravel’s database seeding functionality to create the first user on the system. The first user should have the following credentials:
 - a. Email: info@trailanalytics.com
 - b. Password: admin
 - c. Type: admin
6. You may use jQuery, Vue, Angular or any other javascript framework to enhance the user’s interface experience
7. The underlying database should be MySQL

Want to score additional points?

1. Document your application's code thoroughly
2. Ensure your HTML forms are well validated against unsafe entries
3. Ensure your HTML forms provide useful feedback to the user in the event the input fails validation or is accepted by the system



4. Add graphs to the reports
5. Add the ability to export reports to excel or other commonly used standards
6. Add the ability to log additional user activity such as page hits and the ability to view these logs under the "Report" menu
7. Include a text file in the root directory of your application named "instructions.txt" which will document the following;
 - a. How to install and run your application
 - b. Your recommendations for extra functionality or ways in which the application can be improved



SQL and Databases

Consideration: 25%

The following 2 tables exist in a simple MySQL database

Table Name: FamilyMembers

id	FirstName	LastName	Gender	DateOfBirth
1	Martin	Muwanguzi	Male	1975-08-10
2	Sandra	Muwanguzi	Female	1981-02-11
3	Samantha	Muwanguzi	Female	2004-01-12
4	Tony	Muwanguzi	Male	2006-03-17
5	Timothy	Muwanguzi	Male	2008-03-19
6	Catherine	Muwanguzi	Female	2010-05-21
7	Cynthia	Muwanguzi	Female	2014-09-10

Table Name: PreferredMovies

id	userID	PreferredMovie	TypeOfMovie
1	1	Kingsman	Action
2	1	The Lego Movie	Animation
3	1	Batman vs Superman	Action
4	2	Flatliners	Thriller
5	2	Battle of the Sexes	Drama
6	2	Mother	Drama
7	2	American Made	Drama
8	2	Wonder Woman	Action
9	3	The Lego Movie	Animation
10	3	Beauty and the Beast	Animation
11	4	Kingsman	Action
12	5	The Lego Movie	Animation

13	5	Batman vs Superman	Action
14	5	Guardians of the Galaxy	Action
15	6	Mother	Drama

Hints:

1. userID in table PreferredMovies = id in table FamilyMembers
2. Each of the questions below require only one SQL query.
3. The query (in “2” above) may include a nested query, use joins etc.

Assignment: Write SQL queries to return the following:

1. Which movie is preferred by **most** of the family members

2. Which movie type (TypeOfMovie) is the **least** preferred within the family

3. Top 2 popular movie types by family members older than 10 years

4. Top 2 popular movie types by female family members

5. Family members with no preferred movies



Mobile Apps

Consideration: 15%

Using any Mobile App (Android or iOS, however preference is on iOS) you have developed (or are developing) as a reference, answer the following questions in relation to the Mobile Apps.

1. Provide a brief description of the Mobile App you developed (or, are developing). Please include the name of the App and where it can currently be accessed from (if publically accessible/operational)

2. What challenges is a developer likely to encounter during the development for:

- a. Android devices?

- b. iOS devices?

3. Did you develop your app as a native, web or hybrid application?

4. What guided your decision to develop your app as native, web or hybrid in "2" above?

5. What tools, frameworks and, or languages did you use when developing your app in “2” above?

6. What are your thoughts on the use of HTML 5 and Javascript Framework as opposed to the use of Native code like swift or Java?

7. What are 4 of the most valuable lessons you have learned during the testing of your mobile app(s)?

1.

2.

3.

4.

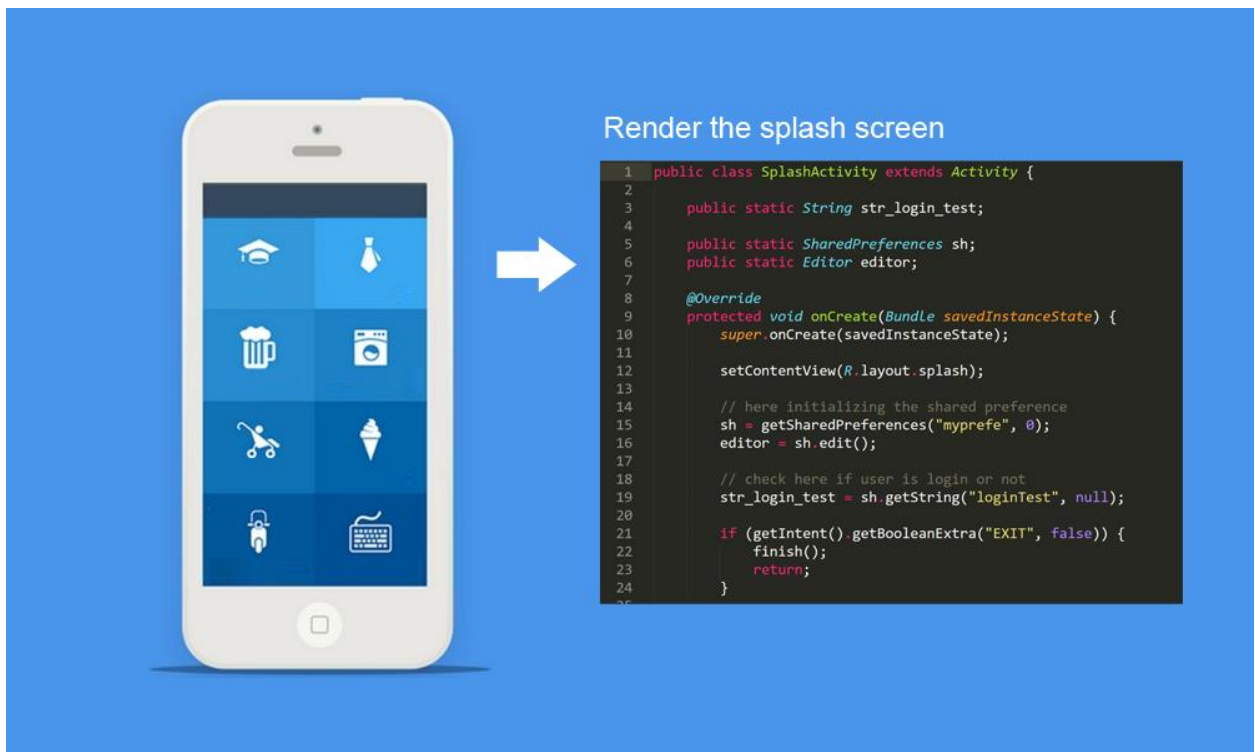
8. In mobile app testing, what do you consider to be the difference between an emulator and a simulator?

9. Would your app (in “2” above) work on a respective tablet device?

10. If your answer was “No” in “8” above, explain what you would do to make the app “tablet compatible”.


11. What steps did you undertake when performing sanity tests on your mobile app in “2” above?

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12. Provide at least 3 sample screenshots from your mobile app in “2” above, and for each screenshot, provide a brief explanation on what the interface does and a snippet of the code. Consider the illustration below as a guide.



Final Submission Instructions

Submit a zipped file containing the following;

 Trail Analytics Interview Responses.zip



On extraction, the zip/rar file should contain



1 Web Application



2 My 3-Page CV



Practical Assessment Responses.pdf

Should contain your responses to the questions and may be in PDF, DOC or DOCX format

Should contain your CV, 3 pages (maximum), and a statement of your expected remuneration (salary).

Should contain the text file "instructions.txt" and the full laravel framework files

In the event the zip file is too big to send by email, create a dropbox account (if you don't have one already) and upload the file to dropbox then share the file with info@trailanalytics.com

All the best!!