SAN JOSÉ STATE UNIVERSITY

SurveyApe

**A Project Report
Presented to
Prof Charles Zhang,
Faculty of College of Engineering**

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1. Introduction

Motivation:

The motivation here was to develop a platform to create, edit and give surveys and where a user can create or invite participants to surveys with variety of options of accessibility like general, open and closed surveys. We analysed the requirements of the project, brainstormed on its design, made choices of technology, Modelled the design using UML, designed the database and used Agile methodology for development.

Introduction:

Survey is an enterprise survey management system with a facility to create, edit, publish, save and take surveys. The Application starts with user registration and email verification using a verification code sent to mentioned email address. Registered users can assume roles of both surveyor and surveyee. As surveyors, users can choose to create a survey, name it, give it a type from general, closed and open, put an expired date optionally, add various types of questions with their plain text or images as options, save the survey to edit it later, publish the survey, invite participants to take the survey and see what surveys has the user been invited to give. A surveyee can take the survey, submit the survey, choose to get an email confirmation for completing the survey and revisit the link to see the response.

2. Bonus Features

2.1. Export Survey

- Existing Survey:

Create Survey   Logout

Welcome **varun** !

CheckBox

RadioGroup

DropDown

YesNo

ShortAnswer

DateTime

StarRating

general survey 1[general]   End Date: mm/dd/yyyy

Export Survey   Import Survey   Close   Unpublish

How did you hear first about out website?   Delete   ☐ Image Option   Add Option

☐ newspaper   ✖
☐ internet   ✖
☐ television   ✖
☐ other source   ✖

How likely are you to use our services again?   Delete

Rating   ★★★★★

Comments or Suggestions   Delete

Option   This is a sample input box for user input

How likely are you to let your friends know about our website?   Delete

◯ YES
◯ NO

Select the best image   Delete   ☐ Image Option   Add Option
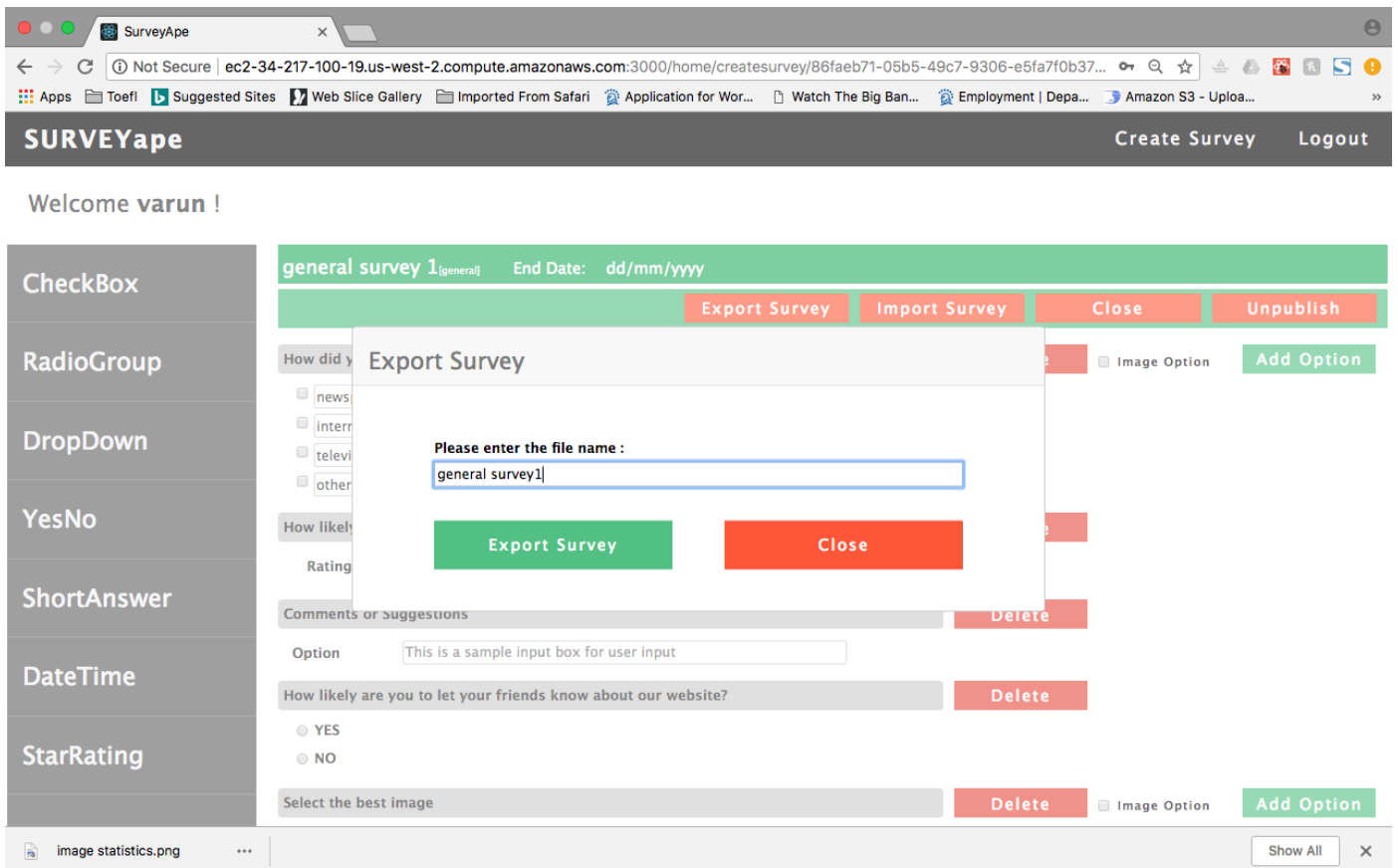
◯ Choose File No file chosen   ✖
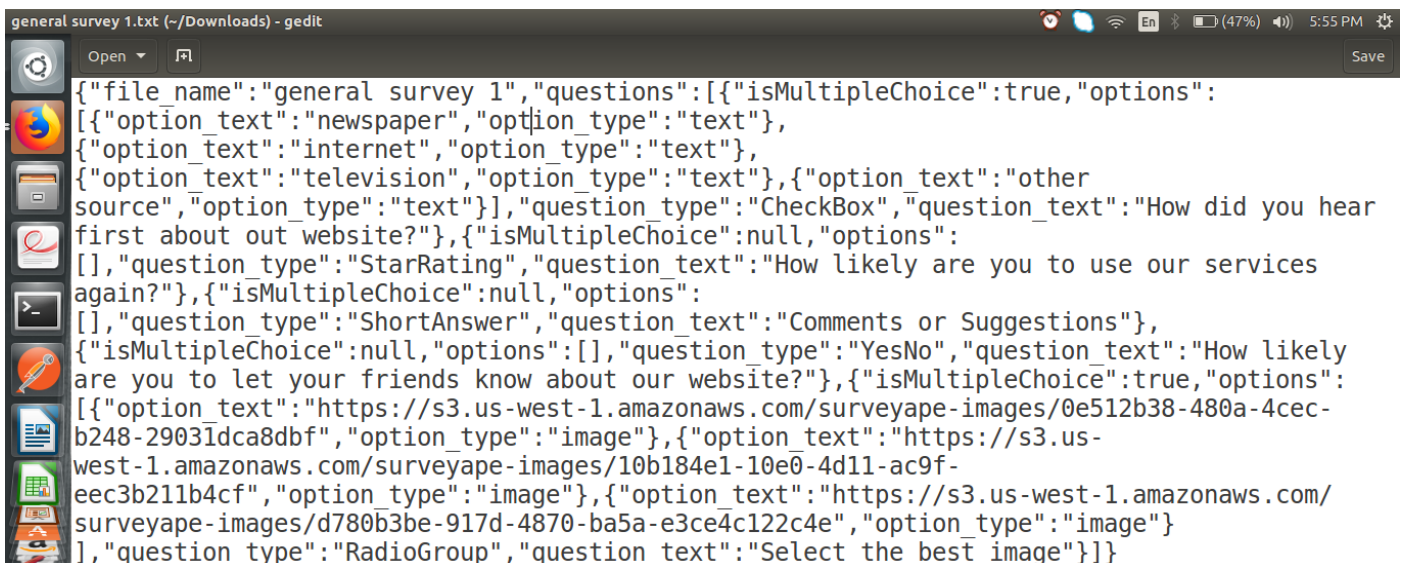
◯ Choose File No file chosen   ✖

◯ Choose File No file chosen   ✖

- Clicking Export survey gives user following modal asking for filename

- Export survey downloads survey in JSON format in text file:

{"file_name":"general survey 1","questions":[{"isMultipleChoice":true,"options":[{"option_text":"newspaper","option_type":"text"},{"option_text":"internet","option_type":"text"},{"option_text":"television","option_type":"text"},{"option_text":"other source","option_type":"text"}],"question_type":"CheckBox","question_text":"How did you hear first about out website?"},{"isMultipleChoice":null,"options":[],"question_type":"StarRating","question_text":"How likely are you to use our services again?"},{"isMultipleChoice":null,"options":[],"question_type":"ShortAnswer","question_text":"Comments or Suggestions"},{"isMultipleChoice":null,"options":[],"question_type":"YesNo","question_text":"How likely are you to let your friends know about our website?"},{"isMultipleChoice":true,"options":[{"option_text":"https://s3.us-west-1.amazonaws.com/surveyape-images/0e512b38-480a-4cec-b248-29031dca8dbf","option_type":"image"},{"option_text":"https://s3.us-west-1.amazonaws.com/surveyape-images/10b184e1-10e0-4d11-ac9f-eec3b211b4cf","option_type":"image"},{"option_text":"https://s3.us-west-1.amazonaws.com/surveyape-images/d780b3be-917d-4870-ba5a-e3ce4c122c4e","option_type":"image"}],"question_type":"RadioGroup","question_text":"Select the best image"}]}

2.2. Import Survey

- Before import survey

- Select file for importing survey

- After import survey

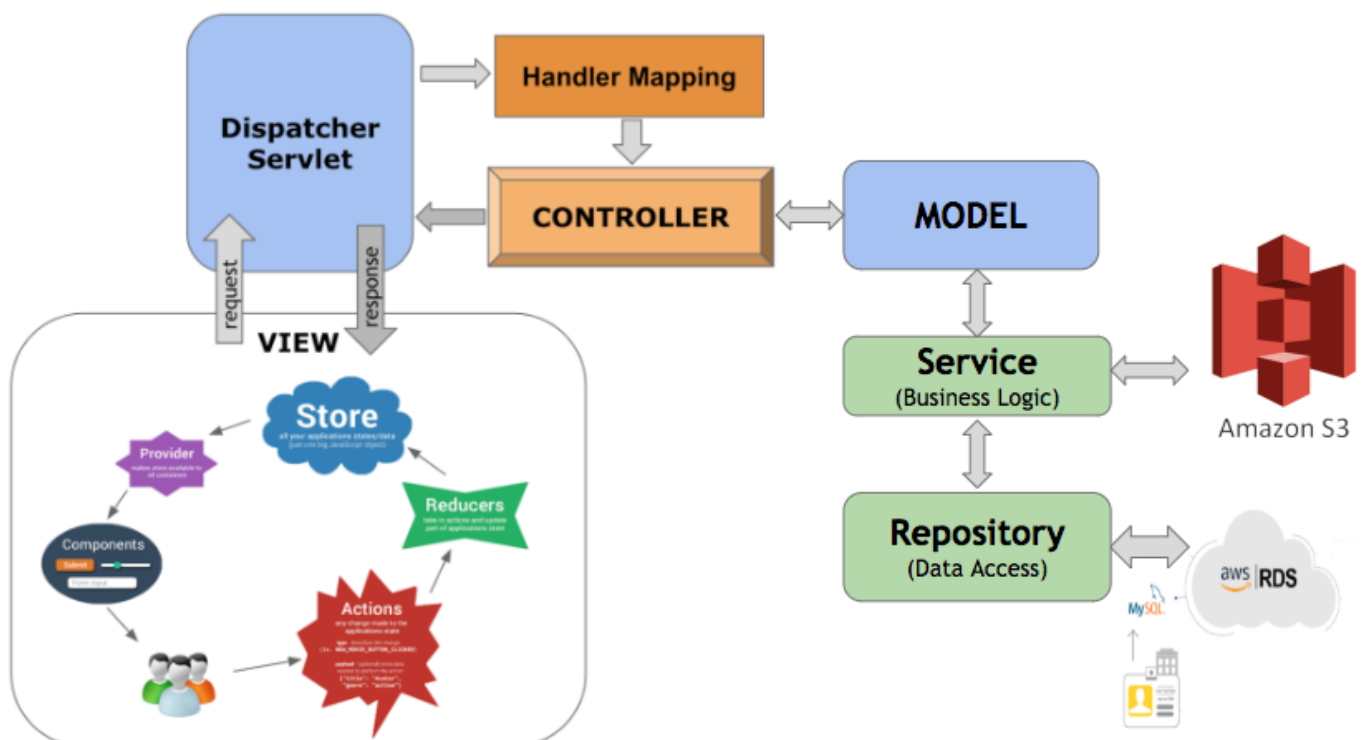## 3. Design and Architecture

3.1. High Level Components Architecture

RESTful Web Application is developed using React as front-end. Also used Redux to maintain state at global level. Used Spring Boot to develop server in which REST Controller were developed to create REST connection with React. Used concept of AOP to verify Session for activities that are only authorized to

logged in users. Used MySQL Database of AWS RDS to have centralized database and also being a RDBMS MySQL supports spring boot's JPA functionality. Created AWS S3 bucket for storing images for multiple choice questions. React is deployed on EC2 Instance and Spring Boot Server is deployed on another EC2 Instance.

3.2. Database Design
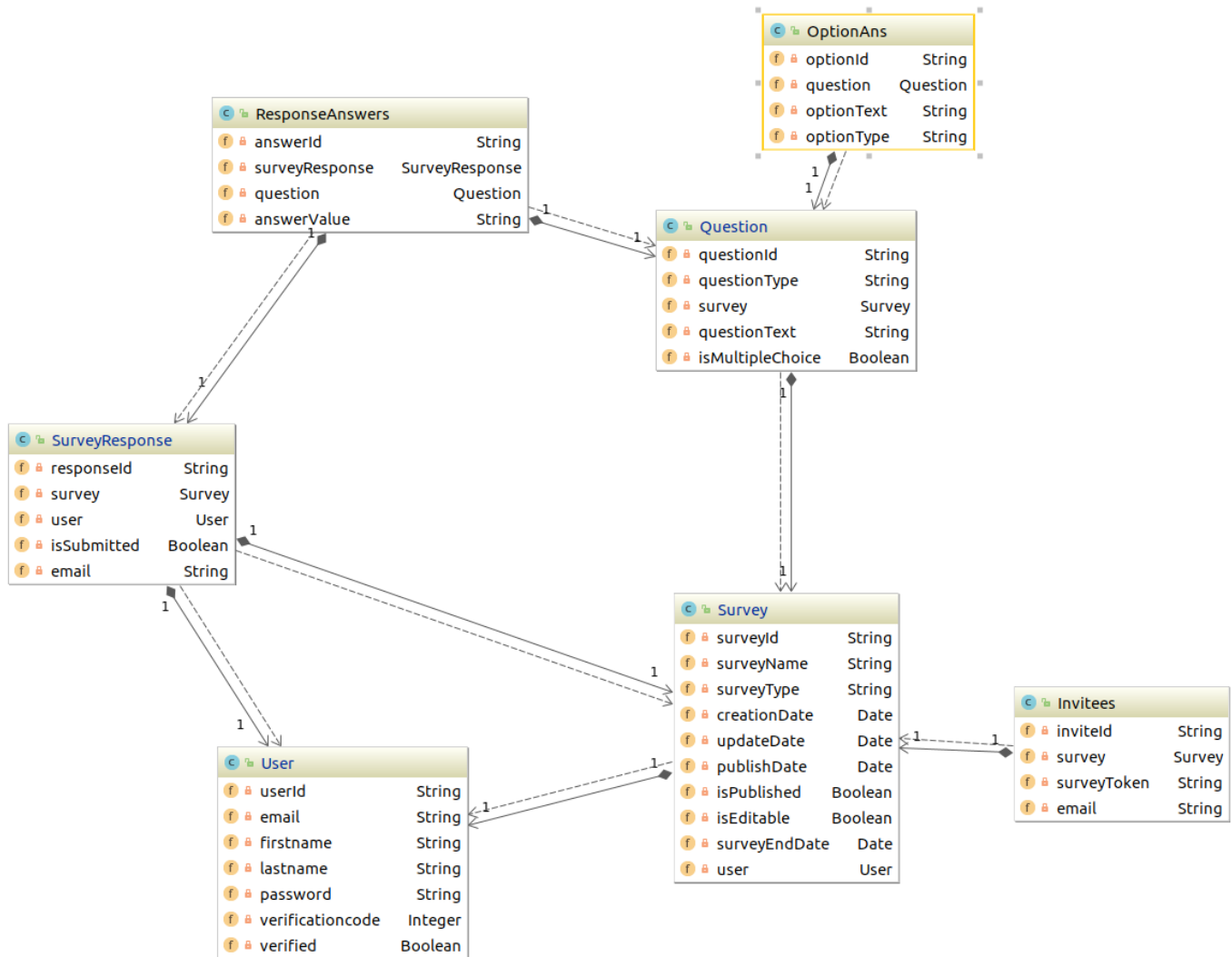
4. Technologies

- Client:
  - React – Redux

- Server:
  - Spring Boot
    - ORM
    - JPA
    - Hibernate
    - AOP

- Database:
  - AWS RDS MySQL

- Image Data Storage:
  - AWS S3 Bucket

- Deployment
  - AWS EC2 Instances
    1. Client Instance (React)
    2. Server Instance (Spring Boot)

5. Screenshots

5.1. Signup

- Email received to verify account
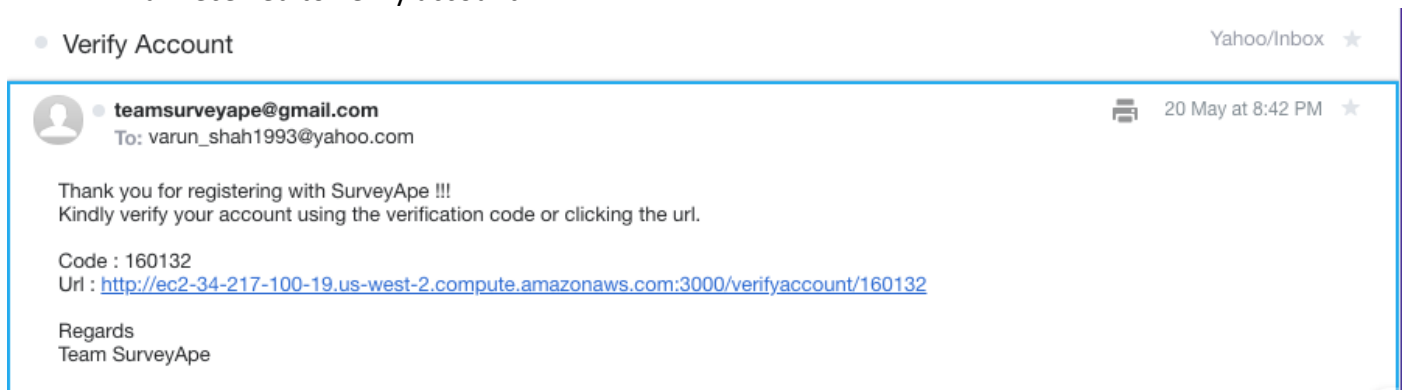
- User can provide verification code in modal as well as can click on the link in email to verify

SIGN UP

VERIFICATION MODAL ✕

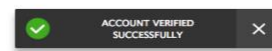**Enter the code to verify your account**

| 1 | - | 6 | - | 0 | - | 1 | - | 3 | - | 2 |

Submit   Close

SIGN UP

VERIFICATION SUCCESS

✔

Close

✔ ACCOUNT VERIFIED SUCCESSFULLY ✕

● Account Verification Successfult   Yahoo/Inbox ★

teamsurveyape@gmail.com   🖨 20 May at 8:42 PM ★
To: varun_shah1993@yahoo.com

Congratulations. You have successfully verified your account.

↩ ↩↩ ➡ ⋯

5.2.Login

SurveyApe ✕

← → C ⓘ Not Secure | ec2-34-217-100-19.us-west-2.compute.amazonaws.com:3000/login ☆

⦂⦂⦂ Apps 📁 Toefl ▶ Suggested Sites ▶ Web Slice Gallery 📁 Imported From Safari Application for Wor... Watch The Big Ban... Employment | Depa... Amazon S3 - Uploa... »

SURVEYape
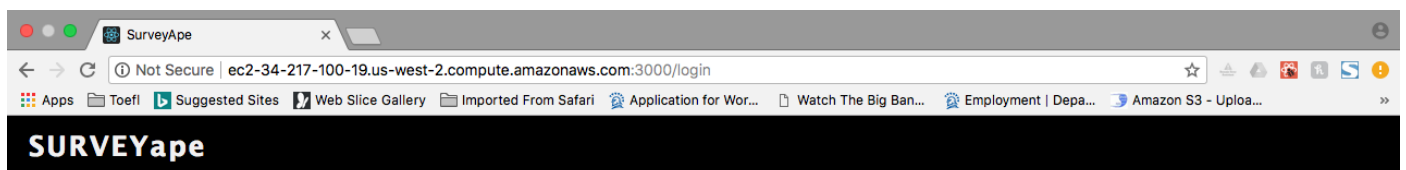
SIGN IN

Enter Email

Enter Password

Login

Don't have an account ?Sign Up

📄 response_submitted.png ⋯   Show All ✕

5.3.Survey Dashboard

SURVEYape   Create Survey   Logout
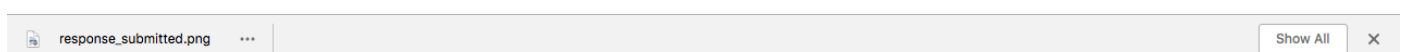
Welcome **Sannisth** !

Surveys created by me

Survey Name : **Survey1**
Survey Type : **general**

Survey Name : **SurveyClosed**
Survey Type : **closed**

Survey Name : **SurveyOpen**
Survey Type : **open**

Surveys created for me

Survey Name : **opensurveytest1**
Survey Type : **open**   **View Response**

Survey Name : **ClosedSurvey**
Survey Type : **closed**   **Take Survey**

Survey Name : **Survey1**
Survey Type : **general**   **View Response**

5.4.Create Survey (Survey Builder)

- User can create 3 types of Survey: General, Open, Closed

- Survey Builder Page: User can create, edit, import, export or publish the survey

5.5.Share Survey

- User can share survey by providing surveyee email

- On share survey given input email receives following email with participation link and QR Code:

5.6. Survey Response
    1..1. General Survey
        o General Survey with general link. User can submit multiple response unless signed in

1..2. Open Survey
- o Open survey with link and QR Code
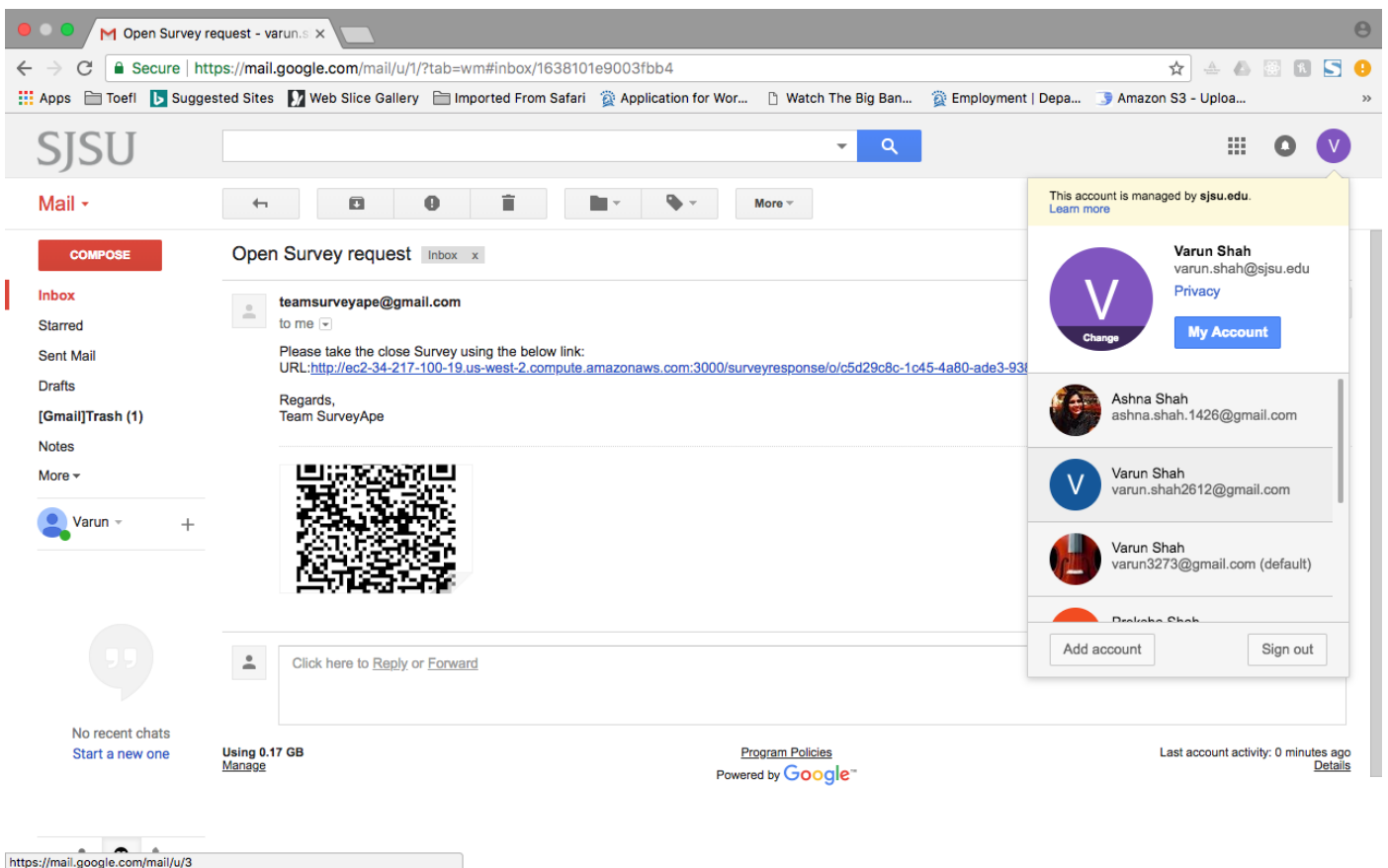
1..3. Closed Survey
- o Closed survey with link and QR Code

1..4. Survey Response Page. Option for receive submission confirmation is also visible

Survey Name: SurveyClosed

Question:

What is shape of The Earth?
- [ ] Flat
- [ ] Oblate Ellipsoid

Question:

Where would you rather live?
- ○ Venus
- ○ Mars

Question:

Are you going for a movie this weekend?
- ○ YES
- ○ NO

Question:

What is your name?

Question:

What is your birthday?

dd / mm / yyyy, --:-- --

Question:

How would you rate this survey?
★★★★★

Email: varun.shah@sjsu.edu
- [ ] I want to receive confirmation email

Submit

1..5. Submitted Response visible in read only format

Survey Name: SurveyClosed

Question:

What is shape of The Earth?
- ☐ Flat
- ☑ Oblate Ellipsoid

Question:

Where would you rather live?
- ◯ Venus
- ◉ Mars

Question:

Are you going for a movie this weekend?
- ◯ YES
- ◯ NO

Question:

What is your name?

varun

Question:

What is your birthday?

26/12/1993, --:-- --

Question:

How would you rate this survey?

★★★★★

5.7.Survey Statistics

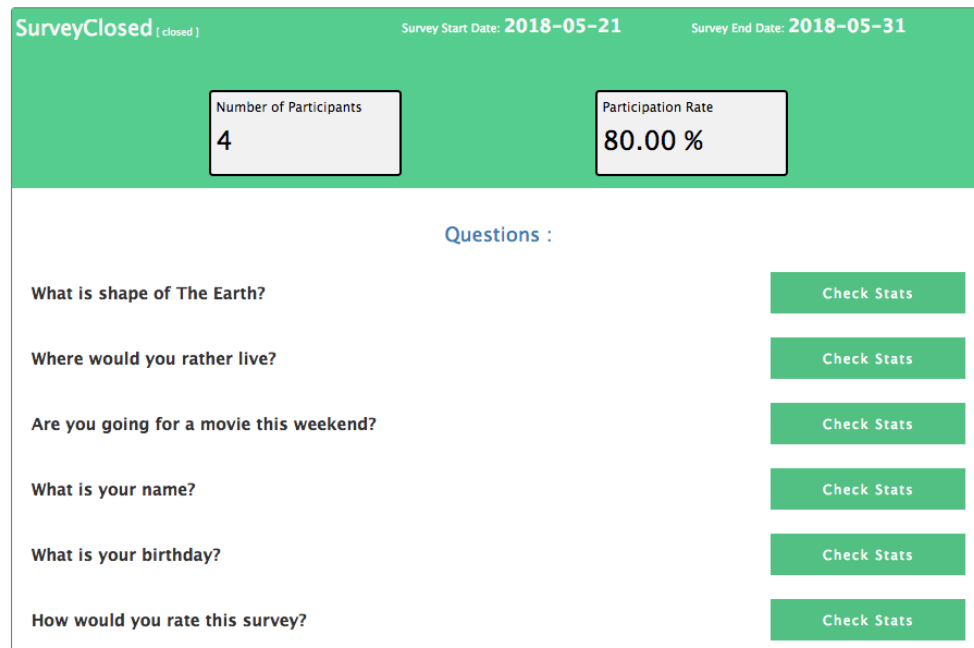- Statistics Dashboard with questions of survey. Stats for each question can be seen on clicking check stats

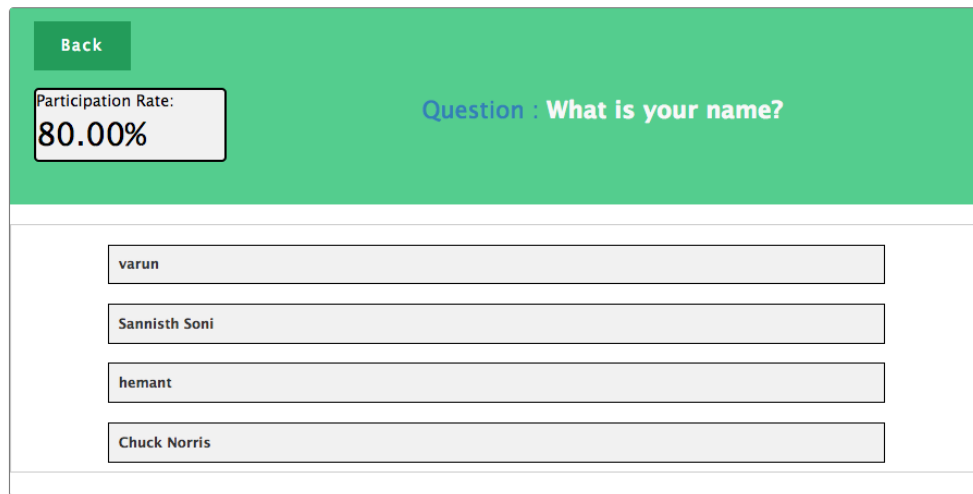- Statistics for Multiple choice question type Image

Welcome **varun** !

Back

Participation Rate:
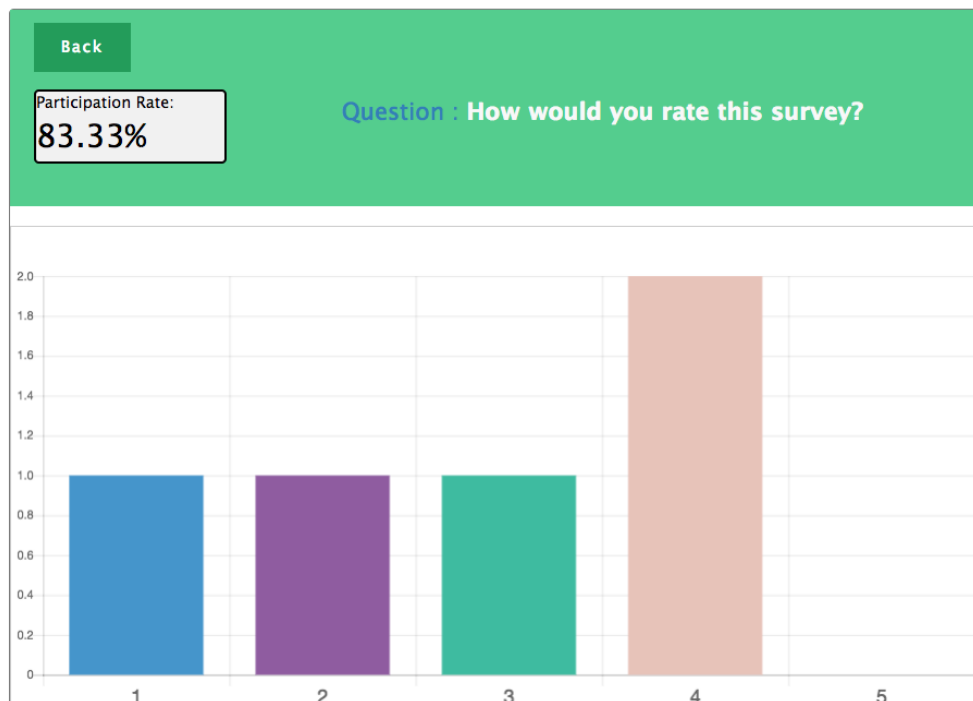
75.00%

Question : **Select the best image**

- Statistics for Question Type Short Answer

• Statistics for Rating

6. Testing Plans

6.1. Black-Box Testing

Test No	Test Description	Expected Result	Actual Result	Result
1	Password Validation	Should not allow passwords shorter than 8 characters	Didn't allow passwords shorter than 8 characters	Pass
2	Email Validation	Should not allow invalid email IDs	Didn't allow invalid email IDs	Pass
3	Login Button Click	Should be taken to user dashboard	Was taken to user dashboard	Pass
4	Account Verification	Email with a verification code should be send to given email ID	Email send with a verification code to given email ID	Pas
5	Logout	Session should be cleared and user should be taken to login page.	Session is cleared and user is taken to login page	Pass
6	Survey creation	Given survey name, survey type and an optional end date, a new empty survey should be created.	Given a survey name, survey type and an optional end date, survey is created.	Pass
7	Image Options	Surveyor should be allowed to upload images as options to survey questions	Surveyor is able to upload images as options to survey questions	Pass
8	Survey Save	Survey can be saved and can be later accessed to continue work from where it was left.	Survey is saved and is accessible to continue work from where it was left	Pass
9	Survey Publish	Survey should be published and can now be shared with surveyees and surveyees can take the survey	Survey is published and can be now shared with surveyees and surveyees can take the survey	Pass
10	General Survey Link Share	Invitations to share the survey should be send by email with URL and QR code	Invitations to share the survey is sent by email with URL and QR code	Pass
11	General survey resubmission by a logged in User	A logged in user cannot take a general survey again	A logged in user cannot take a general survey again	Pass
12	Closed survey invitation link	Invalidate the link once the closedsurvey is taken.	The link is invalidated when the closed survey is taken	Pass
13	Invisible unpublished survey	Surveys not yet published cannot be accessed by any user	Surveys not yet published are not accessed by user	Pass

14	Expired Surveys	Surveys cannot be accessed past their endtime	Surveys are not accessed past their endtime	Pass
15	General Statistics	Surveyor would be able to see start time, end time, number of participants and participation rate	Surveyor is be able to see start time, end time, number of participants and participation rate	Pass
16	Questionwise statistics	Surveyor would be able to see number of distribution of each answer choice, all answers provided by surveyees and response rate among total number of submissions.	Surveyor is be able to see number of distribution of each answer choice, all answers provided by surveyees and response rate among total number of submissions.	Pass
17	Save partially filled surveys	User should be able to logout midway the survey and can take it later	User is able to logout midway and can take the survey later.	Pass
18	Survey saved on each step	Surveyor's progress be saved on each step	Surveyor's progress is saved on each step	Pass
19	Survey Completion Confirmation email	Surveyee should be send an email confirming reception of response.	Surveyee is sent an email confirming the reception of response.	Pass
20	Export survey	Survey can be exported in JSON format in a textfile	Survey is exported in JSON format in a textfile	Pass
21	Import survey	Survey can be imported from a JSON format text	Survey is imported from a JSON format text	Pass
22	JSON format of survey	Survey JSON be a valid JSON	Survey JSON is a valid JSON	Pass
23	Append from a survey JSON	Survey from Survey JSON should be appended into a current survey	Survey from survey JSON can be appended into a current survey	Pass
24	Survey access	Surveyee with or without an account should access survey.	Surveyee with or without account do access survey	Pass
25	Single account for Surveyor and Surveyee	A user should be able to assume roles of surveyor and surveyee from a single account	A user is able to assume roles of surveyor and surveyee from a single account	Pass

6.2.Server Unit Testing

Test No	Test Description	Expected Result	Actual Result	Result
1	Testing User Sign up	{"userId":"123456","email":"test_user@gmail.com","firstname":"Sanisth","lastname":"Soni","verified":true}	{"userId":"123456","email":"test_user@gmail.com","firstname":"Sannisth","lastname":"Soni","verified":true}	Pass
2	Validating Session	{"userId":"123456","email":"test_user@gmail.com","firstname":"San	{"userId":"123456","email":"test_user@gmail.com","firstname":"Sa	Pass

		nisth","lastname":"Soni","verified":true}	nnisth","lastname":"Soni","verified":true}	
3	Verifying Account	{"message":"User successfully verified."}	{"message":"User successfully verified."}	Pass
4	Testing User Login	{"userId":"123456","email":"test_user@gmail.com","firstname":"Sanisth","lastname":"Soni","verified":true}	{"userId":"123456","email":"test_user@gmail.com","firstname":"Sannisth","lastname":"Soni","verified":true}	Pass
5	Creating a new Survey	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":true,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":true,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	Pass
6	Fetch Survey	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":true,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":true,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	Pass
7	Updating a survey	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_	Pass

		date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":true,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":true,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	
8	DeleteOption	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":false,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublished":false,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]}	Pass
9	Share Survey	{"message":"Survey shared successfully !!!"}	{"message":"Survey shared successfully !!!"}	Pass
10	Publish Survey	{"message":"Survey published successfully !!!"}	{"message":"Survey published successfully !!!"}	Pass
11	Close Survey	{"end_date":"2018-05-20T00:26:32.703+0000"}	{"end_date":"2018-05-20T00:26:32.703+0000"}	Pass
12	Save End Survey	{"end_date":"2018-05-20T00:28:07.273+0000"}	{"end_date":"2018-05-20T00:28:07.273+0000"}	Pass
13	Upload Question	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublish	{"survey_id":"123456","survey_name":"Survey1","survey_type":"general","creation_date":"2018-01-01T08:00:00.000+0000","update_date":"2018-01-01T08:00:00.000+0000","publish_date":"2018-01-01T08:00:00.000+0000","ispublish	Pass

| | | ed":true,"iseditable":true,"end_da te":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]] | ed":true,"iseditable":true,"end_date":"2018-01-01T08:00:00.000+0000","email":{"email":"test_user@gmail.com"},"questions":[{"isMultipleChoice":false,"options":[],"question_id":"123456","question_type":"MultipleChoiceQuestion","question_text":"How many more Apples are there than oranges?"}],"survey_responses":[{}]] | |

- UserControllerTest

- SurveyResponseControllerTest

- SurveyControllerTest
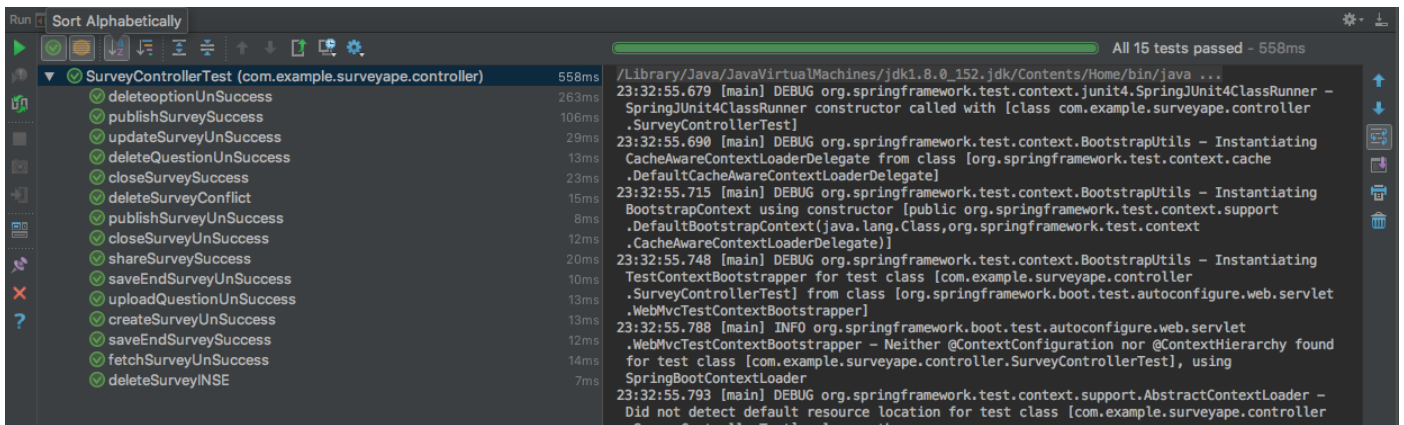
- StatisticControllerTest
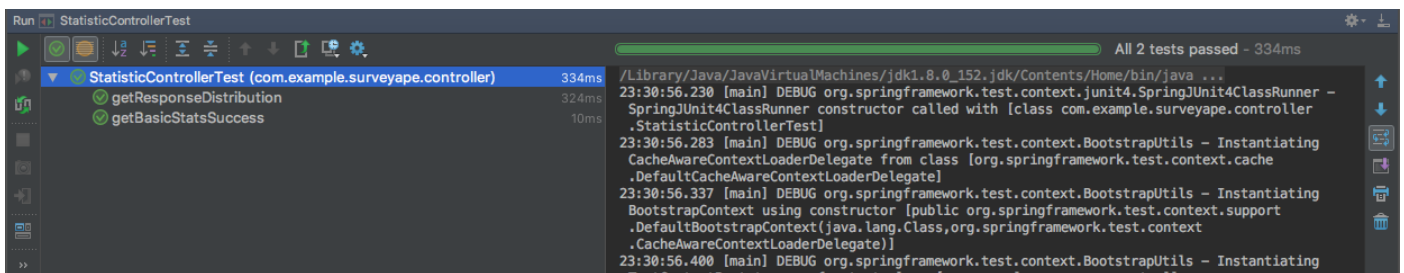
7. Retrospect and Future Enhancements

Retrospection

- A Robust database and architecture design helped in easy integration of changes and/or additions in requirements during development.
- Use of SCM (here git) helped manage and share code better and allowed for retreating to an earlier stable version of code whenever needed.
- Using RDS instance for database from start during the development proved to be beneficial having centralized database on cloud for each user.
- Regular team members status update could have helped team to achieve goal faster and with less difficulties.

Future Enhancements

- We can add load balancing and auto scaling of AWS to deploy application
- We can use NoSQL database like MongoDB, which will be a perfect fit for database trying to store data about questions with variety of question and option types (in key-value JSON format).
- Spring security can be used to make application more secure.
- Insights on users' utilization can be gathered using kibana and application can be modified according to them
- Request Caching can be done using Redis for faster response
- Deployment can be done by dockerizing client and server

8. Github URL
https://github.com/varun1524/SurveyApe

9. Application URL
http://ec2-34-217-100-19.us-west-2.compute.amazonaws.com:3000/