



SAN JOSE STATE UNIVERSITY

Project Report On:



Simulation of indeed using Distributed Enterprise Technologies

Under the guidance of,

Prof. Simon Shim

CMPE 273 Enterprise Distributed Systems

Fall 2021

Team 07

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Komal Joshi (014682551)
Ruchita Dinesh Entoliya (015331966)

Sherin Thlakulathil Elias (014635504)
Shivani Sanjay Degloorkar(015237664)

Contributions

- **Anagha Sethuraman**

1. Landing Page and Navbar UI for Employer. (E2E)
2. Company and Employer Profile Page - Add/Update. (E2E)
3. Job Posting Page
4. Applicant Page - Displaying list of applicants, applicant's profile, applicant's resume and view/update application status.(E2E)
5. Mocha Tests for 10 APIs.
6. Worked on Sign Out functionality and kafka changes for other persona.
7. Performance testing for 100, 200, 300, 400, 500 users dealing with 10k reviews.
- 8.

- **Himakshi Vijayvargiya**

1. MYSQL database setup on AWS RDS.
2. Find Salary and find salary by title Page on the Jobseeker. (E2E)
3. Add salary Review Page under Company Tabs. (E2E)
4. Employer Report Page. (E2E)
5. Admin Analytics Page. (E2E)
6. Access Restriction without login for all the pages in the application.

- **Komal Joshi**

1. Redux setup, including reducers and logout behaviour
2. Kafka set up and documents creation for submissions.
3. Job Seeker profile management including updating profile, resume management(upload/delete/download/replace from S3), job preference handling (E2E)
4. Created Snapshot and about us page (E2E)
5. Enabled kafka testing for 10k reviews data
6. Mongo setup
7. Sign in and Sign Up UI, Admin Sign in Sign up (E2E)
8. MyJobs including Saved and Applied jobs (E2E)
9. Performance testing for 100, 200, 300, 400, 500 users dealing with 10k reviews.
10. Bug fixes.

- **Ruchita Dinesh Entoliya**

1. Database design of the entire application

2. Implemented Signup, login backend functionality with passport JWT authentication implementation for all the personas
3. End-to-end implementation of upload company photos and my photos functionalities.
4. End-to-end implementation of the admin photos, admin reviews, admin company and company statistics pages
5. Implemented end-to-end messaging functionality on both jobseeker and employer pages
6. Created API documentation, design sections of presentation and report for the application
7. Actively involved in coordinating with the team and assisted team with fixing issues

- **Sherin Thlakulathil Elias**

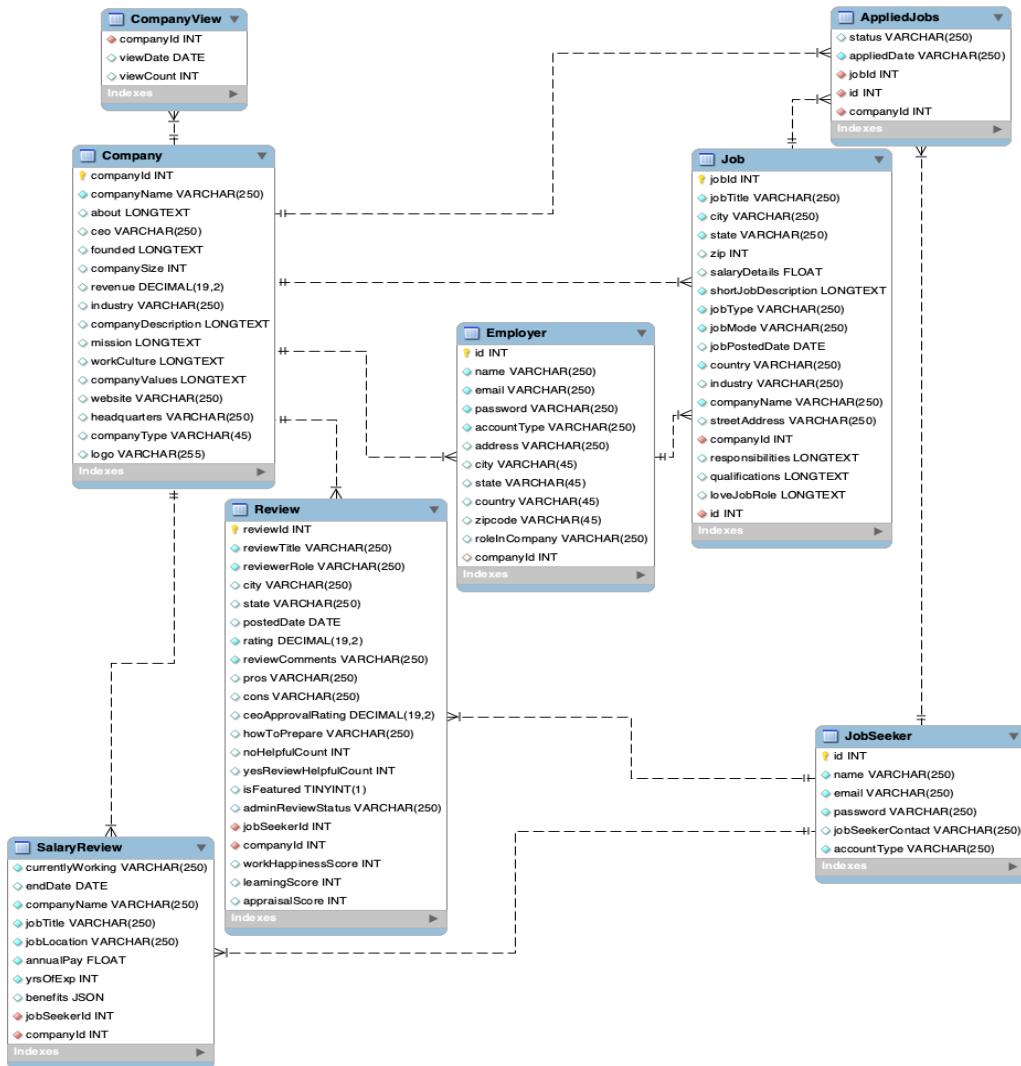
1. Redis setup and caching company snapshot data in redis.
2. Performance testing for 100, 200, 300, 400, 500 users dealing with 10k reviews for redis configuration.
3. Reviews tab for company with sorting based on helpfulness, rating and date, filtering for rating.(E2E)
4. Review this company modal for adding reviews to each company.(E2E)
5. Company reviews tab for showing all company reviews and search by company and location.(E2E)
6. My Reviews page under profile listing company reviews added by logged in user.(E2E)
7. Employer reviews page for viewing reviews and marking featured reviews.(E2E)
8. Post job UI.
9. Final application deployment in AWS

- **Shivani Sanjay Degloorkar**

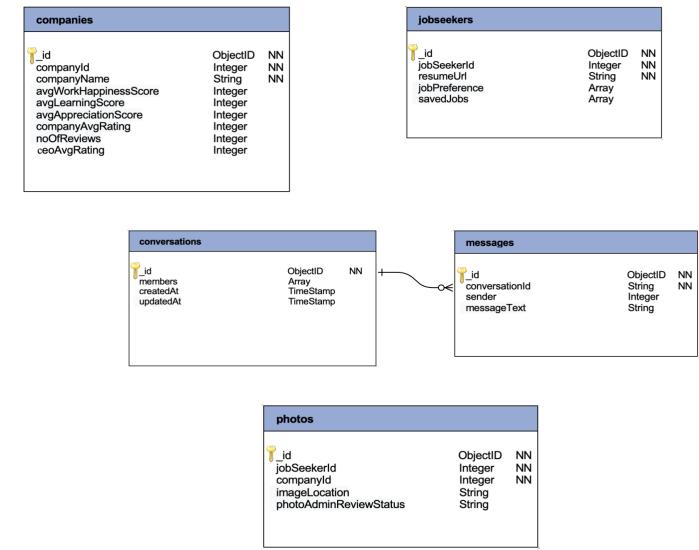
1. Landing page for Job Seeker (E2E)
2. Navbar UI for Job Seeker
3. Company Homepage UI
4. Jobs tab in company homepage (E2E)
5. Apply to jobs page(E2E)
6. Deployed application on EC2 with load balancers and auto-scaling for performance testing and comparison.
7. Performance testing of applications deployed on AWS with above configuration for 100, 200, 300, 400, 500 users.

Database Schema

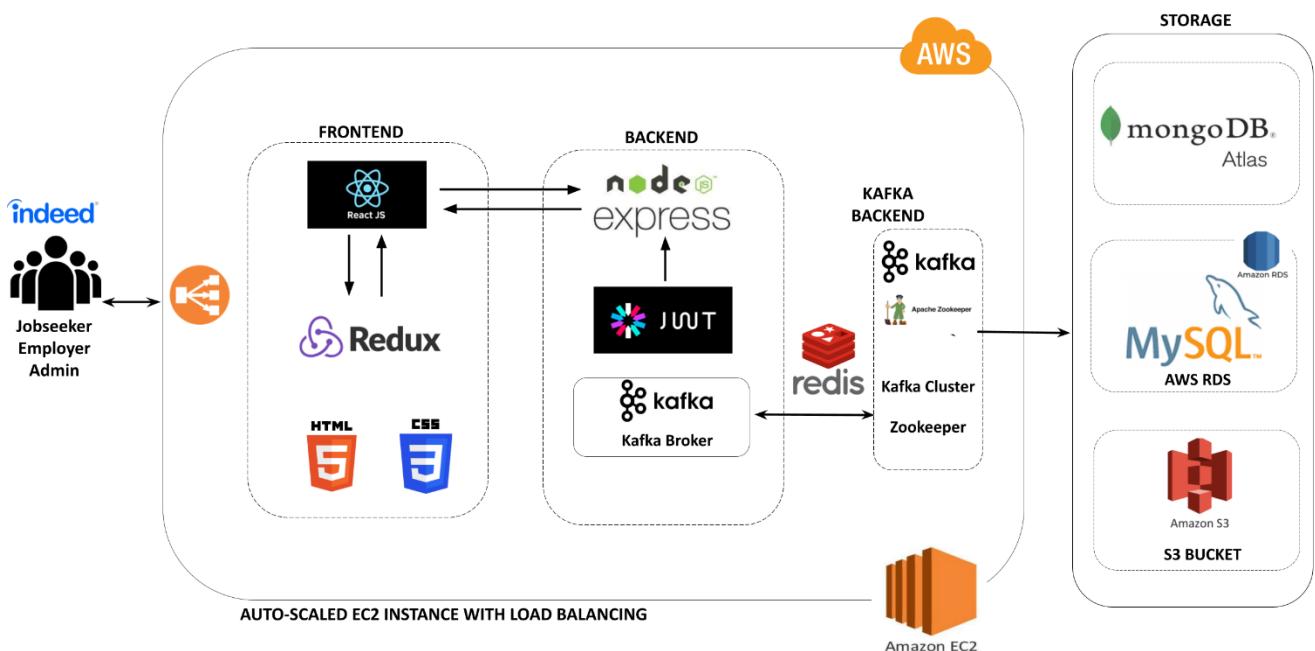
MySQL database schema



MongoDB database schema



System Architecture Design Diagram



Notes

Object Management policy

Backend

- The primary tables JobSeeker, Company and Employer which hold the sensitive information are stored in MySQL.
- As MySQL is a relational database and enforces integrity constraints, all the other tables like Job, AppliedJobs, CompanyView, SalaryReview, Review which are related and hold references to either JobSeeker/Company tables are stored in MySQL.
- MongoDB fetches the data with higher throughput and is efficient in handling complex data types; the photos, messages and company metric related information is stored in MongoDB. MongoDB supports horizontal scalability and document size of about 16MB.
- Images and resumes are stored in Amazon S3 bucket for faster data retrieval.

Frontend

- Redux is used to store user information, company related details and featured reviews. Information stored in redux stores is readily available across all the components of the application. It provided the feature of plug and play so that it is easy to use hooks for fetching the state of the objects.

Heavyweight Resource Handling

Connection Pooling

- We are using connection pooling as it helps to achieve better system performance. It also makes it easy to handle traffic when the application scales up.

Redis Caching

- For faster retrieval of the data from the database we used redis cache. The data that is not frequently changing is stored in the redis cache like the company snapshot information. It aids to optimize application performance.

Kafka

- Kafka the distributed messaging system helped to provide fault tolerance and scalability to our project. The application performance improved with a greater number of concurrent requests.

Database write policies

MySQL

- For data protection, we have stored the sensitive information of JobSeeker, Company and Employer in MySQL
- All the related data like company reviews/salary reviews, company views, jobseeker applied jobs are stored in MySQL as it works better to structure the data better and handle all integrity constraints

MongoDB

- As mongoDB is schemaless, scalable and provides an easy support of complex data types we have stored photo, messages, and company metric information in MongoDB.
- Auto sharding helps to increase the application performance

Screen Captures of the application

Common Pages for all persona :

Default landing page

The screenshot shows the Indeed homepage. At the top, there are search fields for 'What' and 'Where', and a 'Find Jobs' button. Below these are links for 'Post your resume' and 'Employers: Post a Job'. The main content area features a job listing for a 'Software Engineer' at LinkedIn in San Jose, California, with a salary of \$150000. The listing includes a detailed description of LinkedIn's vision and growth. To the right of the job listing is a sidebar for 'Software Engineer' roles, showing 0 reviews and a 'Save' button. Below the job listing, there are sections for 'Job details' and 'Job Type: In-person'.

Sign In Page

The screenshot shows the Indeed sign-in page. It features a 'Sign In' header and a note about agreeing to terms and policies. Below this are fields for 'Email Address' and 'Password', both with placeholder text. There are three radio button options for account type: 'Job Seeker', 'Employer', and 'Admin'. A 'Sign In' button is at the bottom of the form. Below the form, a link says 'New to Indeed? Create an account'.

Sign up

Not Secure | 13.59.205.47:3000/signup

Apps cmpe 285 class 202-git assignme... Slack | cmpe-285... #PNGUYEN | Slack #PNGUYEN | Slack 202-Git manage jdk on mac heroku gpa calculator Greedy for Begin... Read...

Create an account(it's free)

Name

Full Name

Email Address

Enter Email

Password

Password

Your Role

Let us know how you'll be using our products

Job Seeker

Employer

Create Account

Have an account? Sign in
Forgot Your Password?
Help Center

JobSeeker Pages:

Job seeker - After Sign In

indeed Find Jobs Company Reviews Find Salaries

Employers/Post Job

What Where Find Jobs

Post your resume - It only takes a few seconds

Employers: Post a Job

Job feed Recent Searches

December 4, 2021

Job based on your searches

Software Engineer

LinkedIn

San Jose, California, 95134

\$ 150000

LinkedIn's vision is to create economic opportunity for every member of the global workforce. The pandemic has impacted every professional around the world in one way or another, which in turn has vastly accelerated engagement on our platform to a degree we haven't seen before. We actively turn this engagement into opportunity, as it supercharges our hiring, marketing, selling, and learning marketplaces globally and reduces barriers to economic success. As a result, we are entering yet another explosive period of growth.

Software Engineer

LinkedIn

★★★★★

7 reviews

San Jose, California

95134

You must create an Indeed account before continuing to the company website to apply

Apply On Company Site Save

Job details

Job Type:
In-person

Showcasing pagination in landing page

Backend engineer
LinkedIn
San Jose, California, 95134
\$ 130000

We're looking for a Backend Developer to join a company in the Underdog.io network. The Underdog.io network is a curated group of some of the fastest growing startups and tech companies in the country. We actively turn away more than 50% of companies that attempt to join. We accept companies that offer competitive salaries, benefits, and perks. They're working on interesting technical challenges and must be respectful of your time to stay active.

Frontend developer
Meta
San Jose, CA, 95126
\$ 100000

As a Frontend Engineer, you will define and implement the interfaces that power the largest Structured Products platform in existence today and help to expand it to other product classes. We are looking for exceptional engineers who are passionate about building elegant, powerful user interfaces. If you often find yourself thinking about front-end performance optimizations, the intricacies of React, Redux, and Webpack, the best ways to architect front-end application code, or the best experience when trying to visualize large datasets, read on.

< previous 1 2 3 next >

My Profile

indeed Find Jobs Company Reviews Find Salaries

What Where Find Jobs

Post your resume - It only takes a few seconds

Employers: Post a Job

Job feed Recent Searches

December 4, 2021
Job based on your searches

Software Engineer
LinkedIn
San Jose, California, 95134
\$ 150000

Software Engineer
LinkedIn
San Jose, California, 95134
\$ 150000

Software Engineer
LinkedIn
★★★★★
7 reviews
San Jose, California
95134
You must create an Indeed account before continuing to the company website to apply

Apply On Company Site Save

bob@test.com
Profile
My Jobs
My Reviews
My Photos
Sign Out

Add/Download/Remove Resume

← → ⌘ Not Secure | 13.59.205.47:3000/resume

Apps cmpe 285 class Slack | cmpe-255... #PNGUYEN | Slack #PNGUYEN | Slack 202-Git manage jdk on mac heroku gpa calculator Greedy for Beginner... Update Reading List

indeed Find Jobs Company Reviews Find Salaries Employers/Post Job

Your Name

Resume

resume_95

Contact Information

bob@test.com 

Add phone number

Job Preferences

Save specific details like desired pay and schedule that help us match you with better jobs

Resume



resume_95

Contact Information

* Required Fields

First Name *

Bob

Last Name *

User

Email Address  only provided to employers you apply or respond to.

bob@test.com

Phone Number (optional)  only provided to employers you apply or respond to.

 Save  Cancel

Job Preferences

Save specific details like desired pay and schedule that help us match you with better jobs

JobSeeker - job Preferences

Not Secure | 13.59.205.47:3000/preferences

Update preferences as needed to get better recommendations across Indeed.

Interested

We'll show you more jobs that include these details.

Add Preferences

- + Job title
- + Job types
- + Work schedule
- + Pay
- + Relocation
- + Remote

Not Secure | 13.59.205.47:3000/preferences

Update preferences as needed to get better recommendations across Indeed.

Interested

We'll show you more jobs that include these details.

Job Title

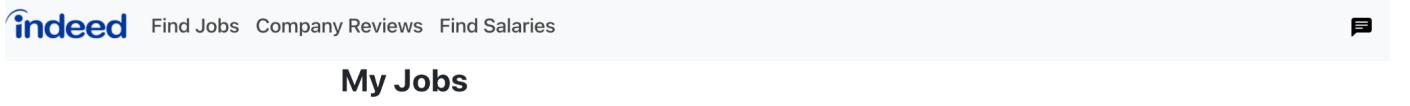
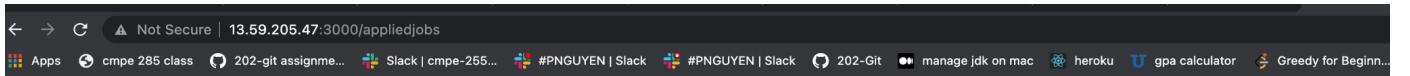
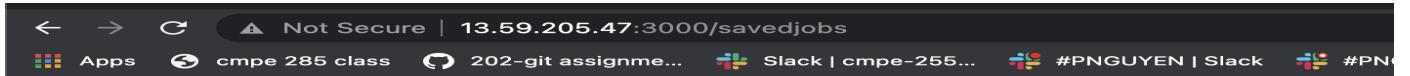
What is your job title?

Save Cancel

Add Preferences

- + Job title

My Job- Saved/Applied



My Reviews

A screenshot of the 'My Reviews' page on Indeed. The page header includes the Indeed logo and navigation links. Below the header, the title 'My reviews' is displayed. Three review cards are listed:

- LinkedIn 5** **Good company to work [Admin approved]**
Software Developer - San Francisco, California - Fri Dec 03 2021
Good team and nice experience
Pros
Good team
Cons
Less pay for location
- LinkedIn 3** **Average review [Admin approved]**
Software Manager - San Jose, California - Fri Dec 03 2021
No work life balance
Pros
Good team
Cons
No pay
- Meta 3.5** **Okayish work culture [Admin approved]**
Developer - Milpitas, California - Fri Dec 03 2021
The work gets boring at times
Pros
Good people
Cons

JobSeeker Messenger Page

Not secure | 13.59.205.47:3000/messenger

indeed Find Jobs Company Reviews Find Salaries Employers/Post Job

John Doe Rejected 1 hour ago Please reconsider. 1 hour ago

We will review for the next term 1 hour ago Thank you. 1 hour ago

write something... Send

Why join us tab

Not Secure | 13.59.205.47:3000/whyJoinUs

indeed Find Jobs Company Reviews Find Salaries Employers/Post Job



LinkedIn 5 reviews 7 reviews

Snapshot Why Join Us Reviews Salaries Photos Jobs

About Us

LinkedIn is an American business and employment-oriented online service that operates via websites and mobile apps. Launched on May 5, 2003, the platform is primarily used for professional networking and career development, and allows job seekers to post their CVs and employers to post jobs.

Work Culture

We value employees and want to create an environment that supports mutual growth.

Company Values

Do what you love, love what you do.

Snapshot tab

← → ⌛ Not Secure | 13.59.205.47:3000/snapshot

indeed Find Jobs Company Reviews Find Salaries

Employers/Post Job

LinkedIn
★★★★★
7 reviews

Snapshot Why Join Us Reviews Salaries Photos Jobs

Work Happiness

Scores based on about 7 responses to Indeed's survey on work happiness.

68.7 Work Happiness Score 67.3 Learning 62.6 Appreciation

Do people feel happy at work most of the time? Do people feel they often learn something at work? Do people feel they are appreciated as a person at work?

About the Company

CEO Founded Company Size Revenue Industry

Company Photos tab

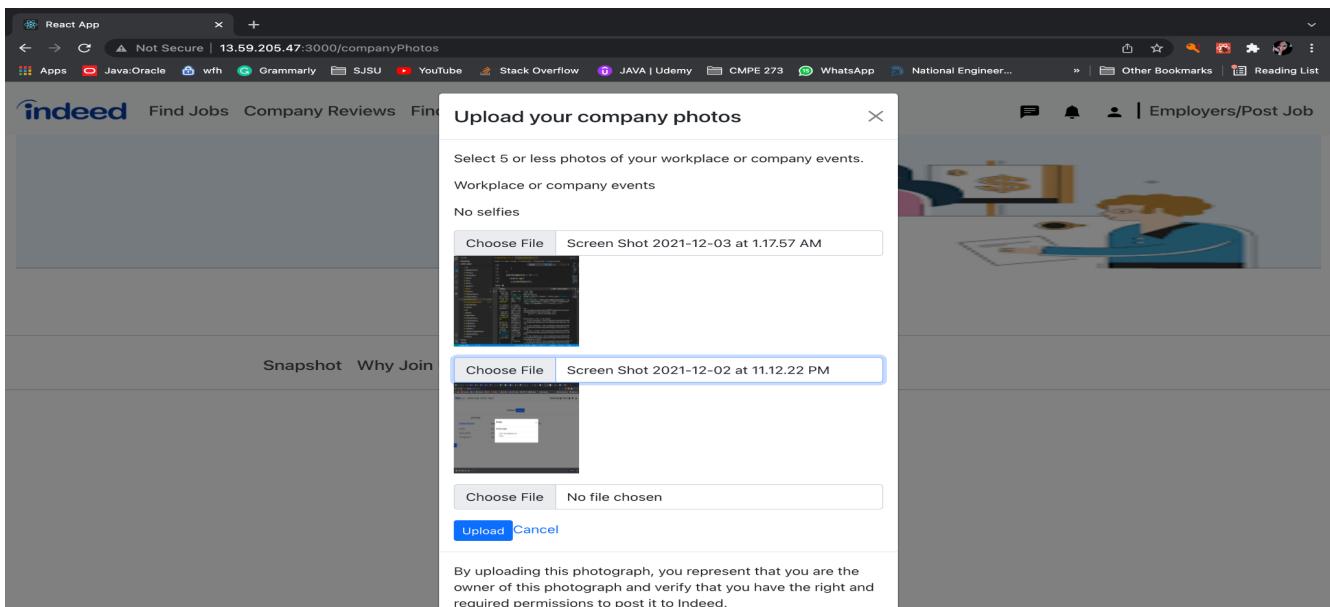
← → ⌛ Not secure | 13.59.205.47:3000/companyPhotos

Meta
★★★★★
4 reviews

Snapshot Why Join Us Reviews Salaries Photos Jobs

Upload a photo

1



Jobs tab

A screenshot of a web browser showing a job search results page for "Meta". The title bar says "Not secure | 13.59.205.47:3000/jobs". The main content area shows the Meta company profile with the logo, name, a 5-star rating, and "4 reviews". Below the profile are navigation links: "Snapshot", "Why Join Us", "Reviews", "Salaries", "Photos", and "Jobs". There are search input fields for "What" and "Where" with a "Find Jobs" button. A sidebar on the left shows a search history with "December 4, 2021" and "Job based on your searches". It lists a "Frontend developer" position from "Meta" in "San Jose, CA, 95126" with a salary of "\$ 100000". A blue button next to it says "Applied to Company".

Find Salaries

The screenshot shows the Indeed 'Find Salaries' page. At the top, there's a search bar with fields for 'What' and 'Where', and a 'Search' button. To the right of the search bar is a cartoon illustration of two people at a desk, one holding a dollar sign and the other looking at a document. Below the search bar, there are four main job categories with their average salaries:

- Software Engineer**: Average Salary \$916666.666666666/year. Buttons for 'Skills' and 'Job Openings'.
- Frontend Developer**: Average Salary \$507140/year. Buttons for 'Skills' and 'Job Openings'.
- Backend engineer**: Average Salary \$792484.8/year. Buttons for 'Skills' and 'Job Openings'.
- Software Developer**: Average Salary \$105046.5/year. Buttons for 'Skills' and 'Job Openings'.

Below these, there's a section for a **Front end developer** with an average salary of \$33425/year, also with 'Skills' and 'Job Openings' buttons.

Find Salaries by Title

The screenshot shows the Indeed 'Find Salaries by Title' page. At the top, there's a search bar with fields for 'What' and 'Where', and a 'Search' button. Below the search bar, it says 'Top companies for the role'. A card for **Walmart** is displayed, showing a salary of \$33425 per year, 1 review, and 0 salaries reported. The card also includes a small logo and a 4-star rating.

Reviews Tab

Not Secure | 13.59.205.47:3000/reviews

Snapshot Why Join Us Reviews Salaries Photos Jobs

Adobe Reviews

Search by rating All Search

Sort By Helpfulness Rating Date

Average review
2 ★★★★☆ Software Tester - San Jose, California - Fri Dec 03 2021
Average work experience
Pros
Good pay
Cons
No work life balance
Was this review helpful?
Yes 2 No 0

Not Secure | 13.59.205.47:3000/reviews

Enter review details

Overall rating* ★★★★★

Work Happiness Score* 0

Learning Score* 0

Appreciation Score* 0

CEO Approval rating* ★★★★★

Review Title* Enter Review Summary

Your job role* Enter your role

City* Enter your city

State* Enter your city

Your Review*

Salaries Tab

This screenshot shows the Indeed Salaries tab. At the top, there's a navigation bar with links for 'Find Jobs', 'Company Reviews', and 'Find Salaries'. On the right, there are icons for messaging, notifications, and employer tools. Below the navigation is a large, stylized illustration of two people working at desks with monitors displaying dollar signs.

In the center, there's a section for 'LinkedIn' with a 4-star rating and 7 reviews. Below this are links for 'Snapshot', 'Why Join Us', 'Reviews', 'Salaries', 'Photos', and 'Jobs'.

Two boxes on the left show salary information: 'Frontend Developer' at '\$120030 per year' and 'Software Engineer' at '\$39000 per year'. On the right, there are buttons for 'Add Salary Review', 'Claimed Profile' (with a green checkmark), and 'Salary satisfaction' with a link to 'Add your rating'.

This screenshot shows the Indeed Salaries tab with a survey overlay titled 'Can you tell us about yourself?*'. The survey questions include:

- 'What's your company name?*' with a dropdown menu labeled 'Company Name *'
- 'Are you currently working at this company?' with 'Yes' and 'No' buttons
- 'What's your job title?*' with a dropdown menu labeled 'Job Title *'
- 'Where's your job location?' with a dropdown menu labeled 'Job Location *'
- 'What's your annual pay at the company?*' with a text input field labeled 'Annual Pay'
- 'How many years of relevant experience do you have?*' with a text input field labeled 'Experience'
- 'Which benefits do you receive at the company?*' with checkboxes for 'Paid time off' and 'Health Insurance'

The right side of the screen shows the same Indeed interface as the first screenshot, including the LinkedIn review section and the 'Add Salary Review', 'Claimed Profile', and 'Salary satisfaction' buttons.

Company Reviews

The screenshot shows the Indeed Company Reviews section. At the top, there are search fields for 'Company Name' and 'Location', along with buttons for 'Find Companies' and 'Clear'. Below this, a section titled 'Popular companies' lists several companies with their average star rating, number of reviews, and job categories (Salaries or Open Jobs). The companies listed are LinkedIn, Meta, Adobe, Walmart Labs, and Walmart.

Company	Avg. Rating	Reviews	Category
LinkedIn	4.5	7 reviews	Salaries
LinkedIn	4.5	7 reviews	Open Jobs
Meta	4.5	4 reviews	Salaries
Meta	4.5	4 reviews	Open Jobs
Adobe	4.5	4 reviews	Salaries
Adobe	4.5	4 reviews	Open Jobs
Walmart Labs	4.5	0 reviews	Salaries
Walmart Labs	4.5	0 reviews	Open Jobs
Walmart	4.5	1 reviews	Salaries
Walmart	4.5	1 reviews	Open Jobs

Employer Pages:

Employer Applicant Page

The screenshot shows the Indeed Employer Applicant Page. At the top, there are links for 'Applicant Page', 'Reviews', and 'Report'. Below this, a header bar includes 'Employers:', a 'Post a Job' button, and a 'Help Center' link. The main content area displays three job postings under 'Jobs Posted': 'Frontend developer', 'Backend Engineer', and 'Software Developer'. Each posting includes the part-time status, posting date, and total applicants.

Job Title	Type	Posted	Total Applicants
Frontend developer	Part-time	Thu Dec 02 2021	2
Backend Engineer	Part-time	Fri Dec 03 2021	2
Software Developer	Part-time	Fri Dec 03 2021	2

The screenshot shows the Indeed for employers Applicant Page. A job posting for a "Backend Engineer" position is selected. The "Applicants List" modal is open, displaying two applicants: Andy and Bob User. A dropdown menu is open for Andy, listing the following screening stages:

- Submitted
- Reviewed
- Initial screening
- Interviewing
- Rejected
- Hired

Employer Post Job

The screenshot shows the Indeed for employers Applicant Page with the "Enter the job opening details" form. The form fields include:

- Company Name:** Meta
- Job Title:** Software Developer
- Industry:** Software
- Select Job Mode:** Remote (selected)
- Select Job Type:** Part-time (selected)
- Enter Job Description:** A detailed description of the job role, mentioning software development for biology and collaboration with team members.
- Responsibilities:** A brief list of responsibilities, including collaborative design, development, testing, and documentation.

Employer Reviews Page

React App Not Secure | 13.59.205.47:3000/featuredReviews

indeed for employers Applicant Page Reviews Report Help Center | test | 🔔 | 📲 | 🙋 | 🚧 | 🌐

Reviews added by jobseekers

3.5 Okayish work culture **Featured**
Developer - Milpitas, California - Fri Dec 03 2021
The work gets boring at times
Pros
Good people
Cons
Mundane tasks

4.5 OSM 0 **Mark as featured**
Tester - San Jose, California - Fri Dec 03 2021
Amazing
Pros
osm
Cons
none

1

Employer Report

React App Not Secure | 13.59.205.47:3000/employerAnalytics

indeed for employers Applicant Page Reviews Report Help Center | test | 🔔 | 📲 | 🙋 | 🚧 | 🌐

JOB POSTED IN A YEAR

Role	Job Posted
Frontend developer	1.0
Backend Engineer	1.0
Software Developer	1.0

APPLICATIONS DETAILS

Category	Value
applicants applied	4.0
applicants accepted	0.0
applicants rejected	1.0

Employer and Company Profile

The screenshot shows a web browser window titled "React App" with the URL "Not Secure | 13.59.205.47:3000/employerUpdateProfile". The page is styled like the Indeed employer interface. It contains two main sections: "Employer Details" and "Company Details".

Employer Details:

- Name :** Tia Thompson
- Role :** Project Manager
- City :** San Jose
- Country :** United States
- Address :** 333 Sunol Street
- State :** CA
- Zipcode :** 95126

Company Details:

- Company Name :** Meta
- Website :** meta.com
- Company Size :** 68177
- About :** Meta Platforms, Inc., [11][12] doing business as Meta[13] and formerly known as Facebook, Inc., [14] is a multinational technology conglomerate based in Menlo Park, California. The company is the parent organization of Facebook, Instagram, and WhatsApp, among other subsidiaries. [15] Meta

Employer Messenger Page

The screenshot shows a web browser window titled "React App" with the URL "Not Secure | 13.59.205.47:3000/messenger". The page displays a messaging interface between the employer and a jobseeker named "Bob User".

Search for jobseekers: (Search bar)

Rejected (Status badge)

Bob User (Jobseeker name)

1 hour ago (Timestamp)

Please reconsider. (Message from employer)

1 hour ago (Timestamp)

We will review for the next term (Message from employer)

1 hour ago (Timestamp)

Thank you. (Message from jobseeker)

1 hour ago (Timestamp)

write something... (Text input field)

Send (Send button)

Admin Pages :

Admin Photos Page

React App +

Not Secure | 13.59.205.47:3000/adminPhotos

Apps Java:Oracle wfh Grammarly SJSU YouTube Stack Overflow JAVA | Udemy CMPE 273 WhatsApp National Engineer... Other Bookmarks Reading List

indeed Companies Photos Reviews Analytics Sign Out

Photos to be approved

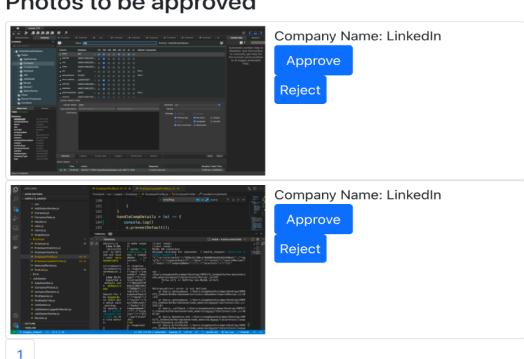
Company Name: LinkedIn

Approve Reject

Company Name: LinkedIn

Approve Reject

1



Admin Reviews Page

React App +

Not Secure | 13.59.205.47:3000/adminReviews

Apps Java:Oracle wfh Grammarly SJSU YouTube Stack Overflow JAVA | Udemy CMPE 273 WhatsApp National Engineer... Other Bookmarks Reading List

indeed Companies Photos Reviews Analytics Sign Out

Reviews to be approved

Company Name: LinkedIn

Review Title: Good

Review Comments: good

Rating: 3.5

Role: Frontend Developer

Approve Reject

Company Name: LinkedIn

Review Title: Average

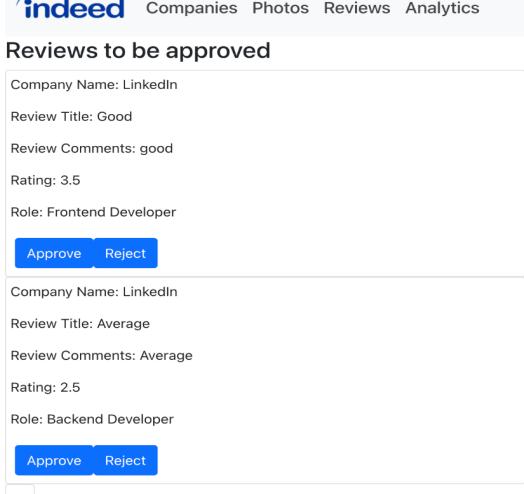
Review Comments: Average

Rating: 2.5

Role: Backend Developer

Approve Reject

1



Admin Analytics Page

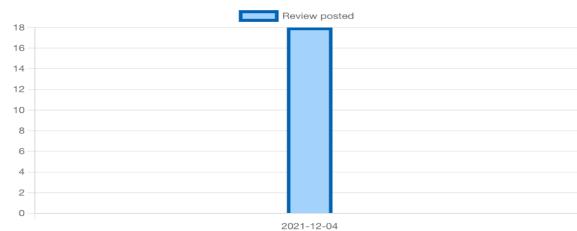
React App +

Not Secure | 13.59.205.47:3000/adminAnalytics

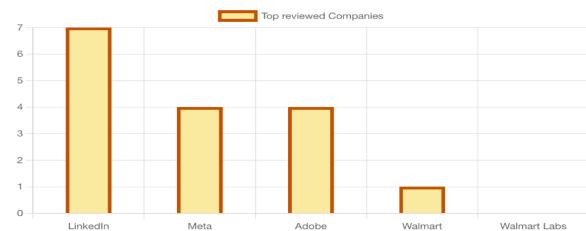
Apps Java:Oracle wfh Grammarly SJSU YouTube Stack Overflow JAVA | Udemy CMPE 273 WhatsApp National Engineer... Other Bookmarks Reading List

indeed Companies Photos Reviews Analytics Sign Out

Review Posted Per Day



Top 5 companies based on average rating



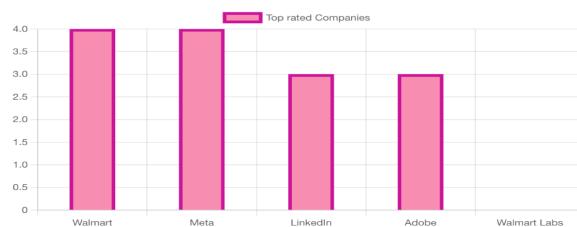
Top 5 most Reviewed Companies



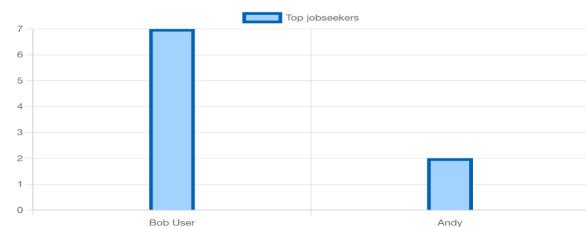
Top 5 job seekers based on total accepted reviews



Top 5 most Reviewed Companies



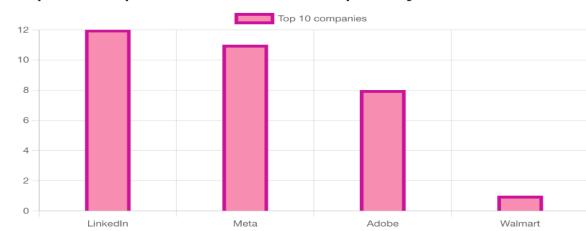
Top 5 job seekers based on total accepted reviews



Top 10 CEOs based on rating



Top 10 companies based on views per day



Admin Companies Page

React App Not Secure | 13.59.205.47:3000/adminCompany

Companies Photos Reviews Analytics Sign Out

Company Name?

LinkedIn	Review Title: Good Review Comments: Employee Friendly Rating: 4.5 Role: Frontend Developer Review Status: REJECTED
Meta	Review Title: Good Review Comments: Good Rating: 3.5 Role: Frontend Review Status: APPROVED
Adobe	Review Title: Good Review Comments: Good Rating: 4.5 Role: Frontend Developer Review Status: REJECTED
Walmart Labs	Review Title: Good Review Comments: Good Rating: 4.5 Role: Frontend Developer Review Status: APPROVED
Walmart	Review Title: Good Review Comments: Good Rating: 4.5 Role: Frontend Developer Review Status: REJECTED

1

Admin - Job Statistics

React App Not Secure | 13.59.205.47:3000/adminCompany

Companies Photos Reviews Analytics Sign Out

Company Name?

Statistics

Category	Value
Number of Applicants Hired	1.0
Number of Applicants Rejected	1.0

2021

Hired

Rejected

LinkedIn

Meta

Adobe

Walmart Labs

Walmart

Job Related Statistics

Review Title: Good
Review Comments: Employee Friendly
Rating: 4.5
Role: Frontend Developer
Review Status: REJECTED

Review Title: Good
Review Comments: Good
Rating: 3.5
Role: Frontend
Review Status: APPROVED

Review Title: Good
Review Comments: Good
Rating: 4.5
Role: Frontend Developer
Review Status: REJECTED

Review Title: Good
Review Comments: Good
Rating: 4.5
Role: Frontend Developer
Review Status: APPROVED

Review Title: Good
Review Comments: Good
Rating: 4.5
Role: Software Manager
Review Status: APPROVED

Code listing of server implementation for entity objects

MongoDB models

Company.js

```
const mongoose = require('mongoose')
const Schema = mongoose.Schema

const comSchema = new Schema({
  companyId: {
    type: Number,
    required: true,
  },
  companyName: {
    type: String,
    required: true,
  },
  logo: {
    type: String,
    required: false,
  },
  avgWorkHappinessScore: {
    type: Number,
  },
  avgLearningScore: {
    type: Number,
  },
  avgAppreciationScore: {
    type: Number,
  },
  noOfReviews: {
    type: Number,
  },
  companyAvgRating: {
    type: Number,
  },
  ceoAvgRating: {
    type: Number,
  },
})
const Company = mongoose.model('Company', comSchema)
module.exports = Company
```

JobSeeker.js

```
const mongoose = require('mongoose');
const Schema = mongoose.Schema;
```

```

const jsSchema = new Schema({
  jobSeekerId: {
    type: Number,
    required: true
  },
  resumeUrl: {
    type: String
  },
  jobPreference: {
    type: Schema.Types.Mixed,
    default: {}
  },
  savedJobs: [
    {
      type: Array,
    }
  ],
  {minimize: false});
}

const JobSeeker = mongoose.model('JobSeeker',jsSchema);
module.exports = JobSeeker;

```

Photo.js

```

const mongoose = require('mongoose');

const PhotoSchema = mongoose.Schema({
  jobSeekerId: {
    type: Number,
    required: true
  },
  companyId: {
    type: Number,
    required: true
  },
  companyName: {
    type: String,
    required: true
  },
  imageLocation: {
    type: String,
    required: true
  },
  photoAdminReviewedStatus: {
    type: String,
    required: true
  }
});
module.exports = mongoose.model('Photo', PhotoSchema);

```

Conversation.js

```

const mongoose = require('mongoose')

const ConversationSchema = mongoose.Schema({
  members: {
    type: Array,
    required: true
  },
}, { timestamps: true })
module.exports = mongoose.model('Conversation', ConversationSchema);

```

Message.js

```

const mongoose = require('mongoose')

const MessageSchema = mongoose.Schema({
  conversationId: {
    type: String
  },
  sender: {
    type: String
  },
  messageText: {
    type: String
  }
}, { timestamps: true })
module.exports = mongoose.model('Message', MessageSchema);

```

Code listing of server implementation of the security and session objects

```

"use strict";
var JwtStrategy = require("passport-jwt").Strategy;
var ExtractJwt = require("passport-jwt").ExtractJwt;
const passport = require("passport");
var { secret } = require("./config");
const conn = require("../config/mysql_connection");
const admin = {
  id: "1",
  name: "Admin"
}

```

```
name: "admin user",
email: "admin@indeed.com",
password: "admin",
id: "adminid_1",
};

// Setup work and export for the JWT passport strategy
function auth() {
  var opts = {
    jwtFromRequest: ExtractJwt.fromAuthHeaderWithScheme("JWT"),
    secretOrKey: secret,
  };
  passport.use(
    new JwtStrategy(opts, (jwt_payload, callback) => {
      const accountType = jwt_payload.accountType;
      console.log("accountType" + jwt_payload.accountType);
      if ("JobSeeker" === accountType) {
        console.log("id" + jwt_payload.id);
        findJobSeekerById(jwt_payload.id, (err, results) => {
          if (err) {
            console.log("err: " + err);
            return callback(err, false);
          }
          if (results) {
            console.log("results");
            callback(null, results[0]);
          } else {
            callback(null, false);
          }
        });
      } else if ("Employer" === accountType) {
        findEmployerById(jwt_payload.id, (err, results) => {
          if (err) {
            return callback(err, false);
          }
          if (results) {
            callback(null, results[0]);
          } else {
            callback(null, false);
          }
        });
      } else if ("Admin" === accountType && jwt_payload.id === admin.id) {
        callback(null, admin);
      } else {
        callback(null, false);
      }
    })
  );
}
```

```

function findJobSeekerById(id, callback) {
  return conn.query("SELECT * from JobSeeker WHERE id = ?", [id], callback);
}

function findEmployerById(id, callback) {
  return conn.query("SELECT * from Employer WHERE id = ?", [id], callback);
}

exports.auth = auth;
exports.checkAuth = passport.authenticate("jwt", { session: false });

```

Code listing of main server code

Backend server.js

```

const conn2 = require('./config/mongo_connection')
const conn1 = require('./config/mysql_connection')
const express = require('express')
const app = express()
const session = require('express-session')
var cors = require('cors')
app.use(cors())

// Connect to MySQL database
conn1.mysqlCon
// Connect to MongoDB
conn2()

// Init Middleware
app.use(express.json({ extended: false }))

app.use(
  session({
    secret: 'secret',
    resave: true,
    saveUninitialized: true,
  }),
)

//Define all the models

require('./models/JobSeeker')
require('./models/Company')
require('./models/Photo')
require('./models/Conversation')
require('./models/Message')

//Define all the routes

```

```

app.use(require('./routes/loginRoute'))
app.use(require('./routes/companyRoute'))
app.use(require('./routes/postNewJob'))
app.use(require('./routes/signupRoute'))
app.use(require('./routes/jobSeekerHome'))
app.use(require('./routes/jobs'))
app.use(require('./routes/uploadPhotos'))
app.use(require('./routes/getAllPhotos'))
app.use(require('./routes/getJobSeekerPhotos'))
app.use(require('./routes/adminPhotos'))
app.use(require('./routes/getEmployerProfile'))
app.use(require('./routes/editEmployerDetails'))
app.use(require('./routes/addEmployerDetails'))
app.use(require('./routes/editCompanyDetails'))
app.use(require('./routes/salaryReviewRoute'))
app.use(require('./routes/adminReviews'))
app.use(require('./routes/companyReviews'))
app.use(require('./routes/findSalary'))
app.use(require('./routes/addCompanyDetails'))
app.use(require("./routes/getCompanyDetails"))
app.use(require("./routes/addCompanyIdToEmployer"))
app.use(require("./routes/employerAnalytics"))
app.use(require("./routes/jobSeekerProfileRoute"))
app.use(require("./routes/employerFeaturedReviews"))
app.use(require("./routes/getPostedJobs"))
app.use(require("./routes/getApplicantsName"))
app.use(require("./routes/getJobSeekerProfile"))
app.use(require("./routes/getJobSeekerResume"))
app.use(require("./routes/allCompanyReviews"))
app.use(require("./routes/adminAnalytics"))
app.use(require("./routes/updateJobSeekerStatus"))
app.use(require("./routes/getAllReviews"))
app.use(require("./routes/conversationRoute"))
app.use(require("./routes/messageRoute"))
app.use(require("./routes/testRoute"))
app.use(require("./routes/reviewsByProfile"))
app.use(require("./routes/getJobSeekerPhotos"))
app.use(require("./routes/myjobs"));

const PORT = process.env.PORT || 5000

//Server code will be running on port 5000
app.listen(PORT, () => console.log(`Server started on port ${PORT}`))

```

Kafka-backend server.js

```

var connection = new require('./kafka/Connection');
const conn2 = require('./config/mongo_connection')
const conn1 = require('./config/mysql_connection')

```

```

// Connect to MySQL database
conn1.mysqlCon
// Connect to MongoDB
conn2()

//Define all the models

require('../models/JobSeeker')
require('../models/Company')
require('../models/Photo')
require('../models/Conversation')
require('../models/Message')

const jobseeker = require('../services/jobseeker');
const employer = require('../services/employer');
const company = require('../services/company');
const admin = require('../services/admin');
const user = require('../services/user');

function handleTopicRequest(topic_name, fname) {
    //var topic_name = 'root_topic';
    var consumer = connection.getConsumer(topic_name)
    var producer = connection.getProducer()
    console.log('server is running ')
    consumer.on('message', function (message) {
        console.log('message received for ' + topic_name + ' ', fname)
        console.log(JSON.stringify(message.value))
        var data = JSON.parse(message.value)

        fname.handle_request(data.data, function (err, res) {
            console.log('after handle', res)
            var payloads = [
                {
                    topic: data.replyTo,
                    messages: JSON.stringify({
                        correlationId: data.correlationId,
                        data: res,
                    }),
                    partition: 0,
                },
            ]
            console.log('sending response' + JSON.stringify(payloads))
            producer.send(payloads, function (err, data) {
                console.log(data)
            })
            return
        })
    })
}

// Add your TOPICs here

```

```
//first argument is topic name
//second argument is a function that will handle this topic request
handleTopicRequest("jobseeker",jobseeker);
handleTopicRequest("employer",employer);
handleTopicRequest("admin",admin);
handleTopicRequest("company",company);
handleTopicRequest("user",user);
```

Code listing of database access or connection

MongoDB connection

```
const mongoose = require("mongoose");
const config = require("./config.js");
const db = config.mongoURI;

const connectDB = async () => {
  try {
    await mongoose.connect(db, {
      useNewUrlParser: true,
      useUnifiedTopology: true,
      maxPoolSize: 10
    });
    console.log("MongoDB Connection Established Successfully");
  } catch (err) {
    console.error(err.message);
    process.exit(1);
  }
};

module.exports = connectDB;
```

MySQL connection

```
const mysql = require('mysql');

const mysqlCon = mysql.createPool({
  host: 'indeedmysql273database.c2oqhcbfsxrv.us-west-2.rds.amazonaws.com',
  user: 'xx',
  password: 'xxx',
  database: 'indeedMysqlDatabase',
  port: 3306
});

mysqlCon.getConnection(function(err){
  if(err) {
    console.log(err.message)
  };
});
```

```

    console.log("MySQL DB connected")
})

module.exports = mysqlCon;

```

Code listing of mocha test

```

//test.js

var supertest = require("supertest");
var app = require("../server");
var server = supertest.agent("http://localhost:5000");
var chai = require("chai");
chai.use(require("chai-http"));
var assert = require('assert');

describe('Indeed', function () {
  describe("Employer Details", () => {
    it('Applicants name List',(done) => {
      server.post("/getApplicantsName")
        .send({ jobId:25,companyId:68 })
        .then(function (res) {
          assert.equal(res.status, 200);
          done();
        })
        .catch(done);
    });

    it('Get Employer Profile',(done) => {
      server.post("/getEmployerProfile")
        .send({empid:21})
    });
  });
});

```

```
.then(function (res) {

    assert.equal(res.status, 200);

    done();

})

.catch(done);

});

describe("Company Details", () => {

it('Get Company Details',(done) => {

server.get("/getCompanyDetails")

.send({ })

.then(function (res) {

    assert.equal(res.status, 200);

    done();

})

.catch(done);

});

it('Get All Company Reviews',(done) => {

server.get("/allReviews")

.send({})

.then(function (res) {

    assert.equal(res.status, 200);

    done();

})

.catch(done);

});
```

```
});

it('Get Posted Jobs',(done) => {
    server.post("/getPostedJobs")
        .send({companyId:68})
        .then(function (res) {
            assert.equal(res.status, 200);
            done();
        })
        .catch(done);
});

it('Get Company Salary Reviews',(done) => {
    server.get("/jobSeeker/getSalaryReview")
        .send({})
        .then(function (res) {
            assert.equal(res.status, 200);
            done();
        })
        .catch(done);
});

describe("Admin Details", () => {
    it('Get Admin Analytics',(done) => {
        server.get("/revPerDay")
            .send({})
            .then(function (res) {
```

```
        assert.equal(res.status, 200);

        done();
    })

    .catch(done);
});

it('Get Top Average Rating Companies',(done) => {

    server.get("/topAvgRatingComp")

    .send({})

    .then(function (res) {

        assert.equal(res.status, 200);

        done();
    })

    .catch(done);
});

describe("Job Seeker Details", () => {

    it('Get Job Seeker Home Page',(done) => {

        server.get("/jobSeeker/home")

        .send({})

        .then(function (res) {

            assert.equal(res.status, 200);

            done();
        })

        .catch(done);
    });

});
```

```
it('Get Job Seeker Home Page',(done) => {

  server.post("/getJobSeekerProfile")

    .send({id :37 })

    .then(function (res) {

      assert.equal(res.status, 200);

      done();

    })

    .catch(done);

  });

})

})
```

Mocha test screenshots

```

\anaghasturaman@Anagha-MBP CMPE273_Indeed_tests % cd Backend
\anaghasturaman@Anagha-MBP Backend % npm test

> backend@1.0.0 test
> mocha

producer ready
Server started on port 5000
Redis Server Connected

    Indeed
      Employer Details
getApplicantsName.....
in make request
{ route: 'getApplicantsName', body: { jobId: 25, companyId: 68 } }
1
returning next
in response
in response1[{"topic":"employer","messages":"{\"correlationId\":\"072df99bc8192f28eabed418241e682d\",\"replyTo\":\"responseTopic7\",\"data\":{\"route\":\"getApplicantsName\",\"body\":{\"jobId\":25,\"companyId\":68}} }","partition":0}]
true
client ready!
in response2
MySQL DB connected
msg received
printing results---[object Object]
response []
  ✓ Applicants name List (161ms)
getEmployerProfile.....
in make request
{ route: 'getEmployerProfile', body: { empid: 21 } }
in response

in response1[{"topic":"employer","messages":"{\"correlationId\":\"91f78f7a76f3a4b8ccbb0eb7d1b20f99\",\"replyTo\":\"responseTopic7\",\"data\":{\"route\":\"getEmployerProfile\",\"body\":{\"empid\":21}} }","partition":0}]
true
in response2
msg received
printing results---[object Object]
response [{"id":21,"name":"Anagha S","email":"anagha@gmail.com","password":"$2a$10$WFWNfpGAMhwNYQ9CFjFoD0d49cQ8kSN9s8NYk3C5iprPNqzPFIxhi","accountType":"Employer","address":"123 Ven st","city":"San Jose","state":"California","country":"United States","zipcode":"12345","roleInCompany":"HR Manager","companyId":68,"companyName":"PayPal","about":"PayPal Holdings, Inc. is an American multinational financial technology company operating an online payments system in the majority of countries that support online money transfers, and serves as an electronic alternative to traditional paper methods such as checks and money orders. The company operates as a payment processor for online vendors, auction sites and many other commercial users, for which it charges a fee.","ceo":"Dan Schulman","founded":"Elon Musk,\nPeter Thiel,\nLuke N osek,\nMax Levchin","companySize":26501,"revenue":21.45,"industry":"Software","companyDescription":"Established in 1998 as Confinity,[6] PayPal went public through an IPO in 2002. It became a wholly owned subsidiary of eBay later that year, valued at $1.5 billion.[7][8] In 2015, eBay spun off PayPal to eBay's shareholders and PayPal became an independent company again.[5][9] The company was ranked 134th on the 2021 Fortune 500 of the largest United States corporations by revenue.", "mission":"Our mission is to democratize financial services to ensure that everyone, regardless of background or economic standing, has access to affordable, convenient and secure products and services to take control of their financial lives.", "workCulture":"Employee Friendly Environment", "companyValues": " Inclusion, Innovation, Collaboration and Wellness", "website":"https://www.paypal.com/us/home", "headquarters":"San Jose", "companyType":"Software", "logo":"https://27indeed.s3.amazonaws.com/paypalogo-1637713872436.jpeg"}]
  ✓ Get Employer Profile (93ms)
  Company Details
in make request
{ route: 'getCompanyDetails', body: {} }
in response
in response1[{"topic":"company","messages":"{\"correlationId\":\"69614a9b24d31015c2b3341aae668f46\",\"replyTo\":\"responseTopic7\",\"data\":{\"route\":\"getCompanyDetails\",\"body\":{} }}","partition":0}]
true
in response2
msg received
printing results---[object Object]

```

response [{"companyId":68,"companyName":"Paypal","about":"PayPal Holdings, Inc. is an American multinational financial technology company operating an online payments system in the majority of countries that support online money transfers , and serves as an electronic alternative to traditional paper methods such as checks and money orders. The company operates as a payment processor for online vendors, auction sites and many other commercial users, for which it charges a fee.", "ceo":"Dan Schulman", "founded":"Elon Musk,\nPeter Thiel,\nLuke Nosek,\nMax Levchin,", "companySize":26501, "revenue":21.45, "industry":"Software", "companyDescription":"Established in 1998 as Confinity,[6] PayPal went public through an IPO in 2002. It became a wholly owned subsidiary of eBay later that year, valued at \$1.5 billion.[7][8] In 2015, eBay spun off PayPal to eBay's shareholders and PayPal became an independent company again.[5][9] The company was ranked 134th on the 2021 Fortune 500 of the largest United States corporations by revenue.", "mission":"Our mission is to democratize financial services to ensure that everyone, regardless of background or economic standing, has access to affordable, convenient and secure products and services to take control of their financial lives.", "workCulture":"Employee Friendly Environment", "companyValues":" Inclusion, Innovation, Collaboration and Wellness", "website":"https://www.paypal.com/us/home", "headquarters":"San Jose", "companyType":"Software", "logo":"https://273indeed.s3.amazonaws.com/paypalogo-1637713872436.jpeg"}, {"companyId":70,"companyName":"TCS","about":"TEST","ceo":"TEST","founded":"TEST","companySize":100,"revenue":0,"industry":"Software", "companyDescription":"TEST", "mission": "TEST", "workCulture": "TEST", "companyValues": "TEST", "website": "tcs@abc.com", "headquarters": "San Jose", "companyType": "IT", "logo": ""}, {"companyId":76,"companyName":"Roku", "about": "Roku was founded in October 2002 as a limited liability company (LLC),[8] by ReplayTV founder Anthony Wood. Roku (六) means \"six\" in the Japanese language, to represent the fact that Roku is the sixth company Wood started.[9]\n\nIn April 2007 Wood was named a vice president of Netflix.[10] After Netflix decided to not build its own player, a new Roku company was incorporated in February 2008, based in Palo Alto, California, with Netflix as an investor of \$6 million , to build a player.[11][12] Later in 2008 company headquarters moved to Saratoga, California, further south in Silicon Valley.[13] A round of venture capital funding from Menlo Ventures was announced in October 2008.[14] Another round of about \$8.4 million was disclosed in 2009.[15][16] In 2015, the company announced it would be sub-leasing the buildings in Los Gatos, California from Netflix.[17]", "ceo": "Anthony Wood", "founded": "Anthony Wood", "companySize": 817, "revenue": 2.27, "industry": "Consumer electronics Broadcast media", "companyDescription": "Roku's consumer products included:\n\nRokuBridge HD1000, a system for displaying images on a high-definition television, as well as streaming MPEG video. The unit has four card readers on the front and can read from a CompactFlash Card type II, Memory Stick, MultiMediaCard, SD Memory Card, or SmartMedia Card[28]\n\nRoku SoundBridge, a network music player[29]\n\nSoundBridge Radio, a network music player with built-in speakers and subwoofer, AM-FM receiver, volume-ramping alarm clock, preset buttons, SD slot, and headphone jack[30]\n", "mission": "Roku pioneered streaming for the TV, and we aspire to power every TV in the world. We developed a streaming platform that delivers a best-in-class user experience. At the heart of the Roku platform is our proprietary operating system, the Roku OS, which we built from the ground up. We believe that all television will be streamed, and that all TVs and set-top-boxes will be powered by software-based operating systems that provide a dramatically improved user experience."}]

```
"software", "companyDescription": "check", "mission": "check", "workCulture": "check", "companyValues": "check", "website": "cogni", "headquarters": "Mumbai", "companyType": "check", "logo": ""}]
  ✓ Get Company Details (87ms)
in make request
{ route: 'allReviews' }
in response
in response1[{"topic": "jobseeker", "messages": "{\"correlationId\": \"1129ae89ad0f89af07f53735940bb28d\", \"replyTo\": \"responsetopic7\", \"data\": {\"route\": \"allReviews\"}}", "partition": 0}]
true
in response2
msg received
printing results---[object Object]
response {
  data: [
    {
      _id: '6189a716b34d35f9680d860a',
      companyId: 68,
      companyName: 'Paypal',
      avgWorkHappinessScore: 60,
      avgLearningScore: 62.6,
      avgAppreciationScore: 64,
      noOfReviews: 12,
      companyAvgRating: 3.3,
      ceoAvgRating: 3.4,
      __v: 0,
      logo: 'https://273indeed.s3.amazonaws.com/paypalogo-1637713872436.jpeg'
    },
    {
      _id: '6189ae8e2fe41ab2fe1bc11',
      companyId: 70,
      companyName: 'TCS',
      avgWorkHappinessScore: 77.3,
      avgLearningScore: 81.3,
    }
  ]
}
```

```
        avgAppreciationScore: 82.5,
        noOfReviews: 6,
        companyAvgRating: 4.2,
        ceoAvgRating: 3.8,
        __v: 0
    },
    {
        _id: '619b08740adf2d2e5f8d8dad',
        companyId: 76,
        companyName: 'Roku',
        avgWorkHappinessScore: 0,
        avgLearningScore: 0,
        avgAppreciationScore: 0,
        noOfReviews: 0,
        companyAvgRating: 0,
        ceoAvgRating: 0,
        __v: 0,
        logo: 'https://273indeed.s3.amazonaws.com/roku%20logo-1637550195372.jpeg'
    },
    {
        _id: '619d8c11e993ec6c559c064f',
        companyId: 79,
        companyName: 'Infosys',
        logo: 'https://273indeed.s3.amazonaws.com/infosys-logo-1637714959885.jpeg',
        avgWorkHappinessScore: 81.5,
        avgLearningScore: 76.5,
        avgAppreciationScore: 80.5,
        noOfReviews: 2,
        companyAvgRating: 4.5,
        ceoAvgRating: 4.8,
        __v: 0
    },
    {

```

```
        avgAppreciationScore: 82.5,
        noOfReviews: 6,
        companyAvgRating: 4.2,
        ceoAvgRating: 3.8,
        __v: 0
    },
    {
        _id: '619b08740adf2d2e5f8d8dad',
        companyId: 76,
        companyName: 'Roku',
        avgWorkHappinessScore: 0,
        avgLearningScore: 0,
        avgAppreciationScore: 0,
        noOfReviews: 0,
        companyAvgRating: 0,
        ceoAvgRating: 0,
        __v: 0,
        logo: 'https://273indeed.s3.amazonaws.com/roku%20logo-1637550195372.jpeg'
    },
    {
        _id: '619d8c11e993ec6c559c064f',
        companyId: 79,
        companyName: 'Infosys',
        logo: 'https://273indeed.s3.amazonaws.com/infosys-logo-1637714959885.jpeg',
        avgWorkHappinessScore: 81.5,
        avgLearningScore: 76.5,
        avgAppreciationScore: 80.5,
        noOfReviews: 2,
        companyAvgRating: 4.5,
        ceoAvgRating: 4.8,
        __v: 0
    },
    {

```

```

"avgWorkHappinessScore":81.5,"avgLearningScore":76.5,"avgAppreciationScore":80.5,"noOfReviews":2,"companyAvgRating":4.5
,"ceoAvgRating":4.8,"__v":0},{"_id":"61a5962dbd766688c2d37a62","companyId":82," companyName": "Nvidia", "logo": "https://273indeed.s3.amazonaws.com/nvidia%20logo-1638241828644.png","avgWorkHappinessScore":0,"avgLearningScore":0,"avgAppreciationScore":0,"noOfReviews":0,"companyAvgRating":0,"ceoAvgRating":0,"__v":0}, {"_id": "61a5d41af6ce07763bf41dce", "companyId": 86, " companyName": "Cognizant", "logo": "", "avgWorkHappinessScore": 0, "avgLearningScore": 0, "avgAppreciationScore": 0, "noOfReviews": 0, "companyAvgRating": 0, "ceoAvgRating": 0,"__v":0}]
    ✓ Get All Company Reviews (92ms)
{ companyId: 68 }
    ✓ Get Posted Jobs (41ms)
Get Salary Review.....
in make request
{ route: 'getSalaryReview', query: {} }
in response
in response1[{"topic": "company", "messages": "{\"correlationId\": \"997605a5550ec9bafcc2ba5604e2dd27\", \"replyTo\": \"responseTopic7\", \"data\": {\"route\": \"getSalaryReview\", \"query\": {}}}", "partition": 0}]
true
in response2
msg received
printing results---[object Object]
response []
    ✓ Get Company Salary Reviews (74ms)
        Admin Details
Admin Analytics Chart One.....
in make request
{ route: 'getChartOne', query: {} }
in response
in response1[{"topic": "admin", "messages": "{\"correlationId\": \"e12add905fdcec3b96e16b13bcbffe45\", \"replyTo\": \"responseTopic7\", \"data\": {\"route\": \"getChartOne\", \"query\": {}}}", "partition": 0}]
true
in response2
msg received
printing results---[object Object]
response [

```

```

[ { revId: 1, postedDate: '2021-11-08' },
  { revId: 1, postedDate: '2021-11-22' },
  { revId: 7, postedDate: '2021-11-23' },
  { revId: 3, postedDate: '2021-11-24' },
  { revId: 6, postedDate: '2021-11-27' },
  { revId: 2, postedDate: '2021-11-30' }
]
    ✓ Get Admin Analytics (91ms)
Admin Analytics Chart Three.....
in make request
{ route: 'getChartThree', query: {} }
in response
in response1[{"topic": "admin", "messages": "{\"correlationId\": \"0279213605c335444b11ed9ac9c0d6c1\", \"replyTo\": \"responseTopic7\", \"data\": {\"route\": \"getChartThree\", \"query\": {}}}", "partition": 0}]
true
in response2
msg received
printing results---[object Object]
response [
{
    _id: '619d8c11e993ec6c559c064f',
    companyId: 79,
    companyName: 'Infosys',
    logo: 'https://273indeed.s3.amazonaws.com/infosys-logo-1637714959885.jpeg',
    avgWorkHappinessScore: 81.5,
    avgLearningScore: 76.5,
    avgAppreciationScore: 80.5,
    noOfReviews: 2,
    companyAvgRating: 4.5,
    ceoAvgRating: 4.8,
    __v: 0
},
{

```

```

    { revId: 1, postedDate: '2021-11-08' },
    { revId: 1, postedDate: '2021-11-22' },
    { revId: 7, postedDate: '2021-11-23' },
    { revId: 3, postedDate: '2021-11-24' },
    { revId: 6, postedDate: '2021-11-27' },
    { revId: 2, postedDate: '2021-11-30' }
]
    ✓ Get Admin Analytics (91ms)
Admin Analytics Chart Three.....
in make request
{ route: 'getChartThree', query: {} }
in response
in response1[{"topic":"admin","messages":{"\\"correlationId\\":\\"0279213605c335444b11ed9ac9c0d6c1\\",\\"replyTo\\":\\"responseTopic7\\",\\"data\\":{\\"route\\":\\"getChartThree\\",\\"query\\":{}}},"partition":0}]
true
in response2
msg received
printing results---[object Object]
response [
{
  _id: '619d8c11e993ec6c559c064f',
  companyId: 79,
  companyName: 'Infosys',
  logo: 'https://273indeed.s3.amazonaws.com/infosys-logo-1637714959885.jpeg',
  avgWorkHappinessScore: 81.5,
  avgLearningScore: 76.5,
  avgAppreciationScore: 80.5,
  noOfReviews: 2,
  companyAvgRating: 4.5,
  ceoAvgRating: 4.8,
  __v: 0
},
{

```

```

  _id: '619b08740adf2d2e5f8d8dad',
  companyId: 76,
  companyName: 'Roku',
  avgWorkHappinessScore: 0,
  avgLearningScore: 0,
  avgAppreciationScore: 0,
  noOfReviews: 0,
  companyAvgRating: 0,
  ceoAvgRating: 0,
  __v: 0,
  logo: 'https://273indeed.s3.amazonaws.com/roku%20logo-1637550195372.jpeg'
}
]
    ✓ Get Top Average Rating Companies (84ms)
Job Seeker Details
Job Seeker home.....
in make request
{ route: 'home', body: {} }
in response
in response1[{"topic":"jobseeker","messages":{"\\"correlationId\\":\\"8661922ef3330f14bd64d4b6f0aa8c6d\\",\\"replyTo\\":\\"responseTopic7\\",\\"data\\":{\\"route\\":\\"home\\",\\"body\\":{}}},"partition":0}]
true
in response2
MongoDB Connection Established Successfully
msg received
printing results---[object Object]
response [
{
  jobId: 25,
  jobTitle: 'Software Developer',
  city: 'San Jose',
  state: 'California',
  zip: 95126,

```

```

isks PayPal takes on and the treatments, actions and experiences triggered by the results of the Risk assessment and used by PayPal to control losses.\n' +
    '\n',
  jobType: 'Full-time',
  jobMode: 'In-person',
  jobPostedDate: '2021-11-08T08:00:00.000Z',
  country: 'United States',
  industry: 'Software',
  companyName: 'Paypal',
  streetAddress: 'qual ave',
  companyId: 68,
  responsibilities: '• Own implementation of a module/application/product\n' +
    '• Participate complex architectural discussions that involve multiple systems\n' +
    '• Identify any product/functionality gaps and collaborate internal product and technology teams to define the necessary development to support solution delivery.\n' +
    '• Drive integration efforts and lead critical work streams of strategic initiatives sponsored by senior executives\n' +
    '• Drive engineering excellency through CI/CD/automation\n' +
    '• Pro-active response in identifying and troubleshooting integration or technical issues.\n' +
    '• Drive engineering excellency by creating reusable, production-ready frameworks\n' +
    '• Challenge the status quo when needed.\n' +
    '• Ownership and strive for excellence in your role',
  qualifications: '• Bachelors degree in Computer Science or related technical discipline (or equivalent experience).\n' +
    '• Expert knowledge in Java, Spring framework, REST\n' +
    '• Experience asynchronous patterns and messaging frameworks (e.g. Kafka)\n' +
    '• Familiarity with other languages and technologies development, including Hadoop, Spark, NoSQL Databases Python , Perl\n' +
    '• Experience in various architecture design patterns, design and implementation of Financial Systems/Platforms.\n' +
    '• Expertise in designing for reliability, availability, scalability and performance in highly regulated Financial Services industry preferred.\n' +
    '• Strong analytical and problem-solving skills.',
```

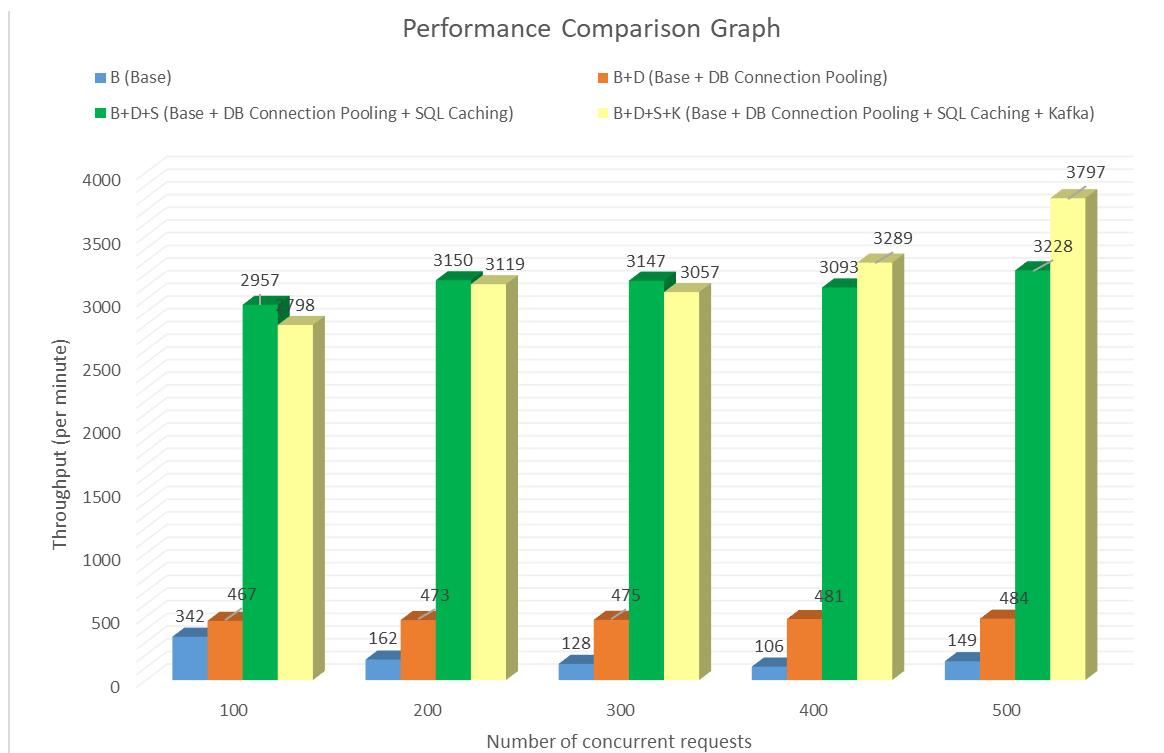
```

jobType: 'Part-time',
jobMode: 'Remote',
jobPostedDate: '2021-11-29T08:00:00.000Z',
country: 'United States',
industry: 'Software',
companyName: 'Paypal',
streetAddress: '234 SoleSt',
companyId: 68,
responsibilities: 'Team player, agile, flexible, multi-tasking, passion for learning new areas\n' +
  'Excellent verbal and written communication\n' +
  'Excellent analytics, problem-solving and debugging skills\n' +
  'Java/Python/Scala development experience\n' +
  'Hands-on experience with Unix/Linux\n' +
  'Experience working with Big Data technologies such as\n' +
  'Hadoop / Spark / Hive / Kafka / HBase / Elastic Search stack - Advantage\n' +
  'Experience with data analytics practices - Advantage',
qualifications: '. Develop and maintain automated test suites, using Python, Java & Scala\n' +
  '. Simulate E2E scenarios using various platforms & technologies\n' +
  '. Report on test progress and bugs found\n' +
  '. Share knowledge with other team members within GDS.',
loveJobRole: 'Will offer full time job based on performance with a joining bonus',
id: 21
}
]
  ✓ Get Job Seeker Home Page (75ms)
37
[ { email: 'sherin@abc.com', jobSeekerContact: '7475747473' } ]
  ✓ Get Job Seeker Home Page (830ms)
```

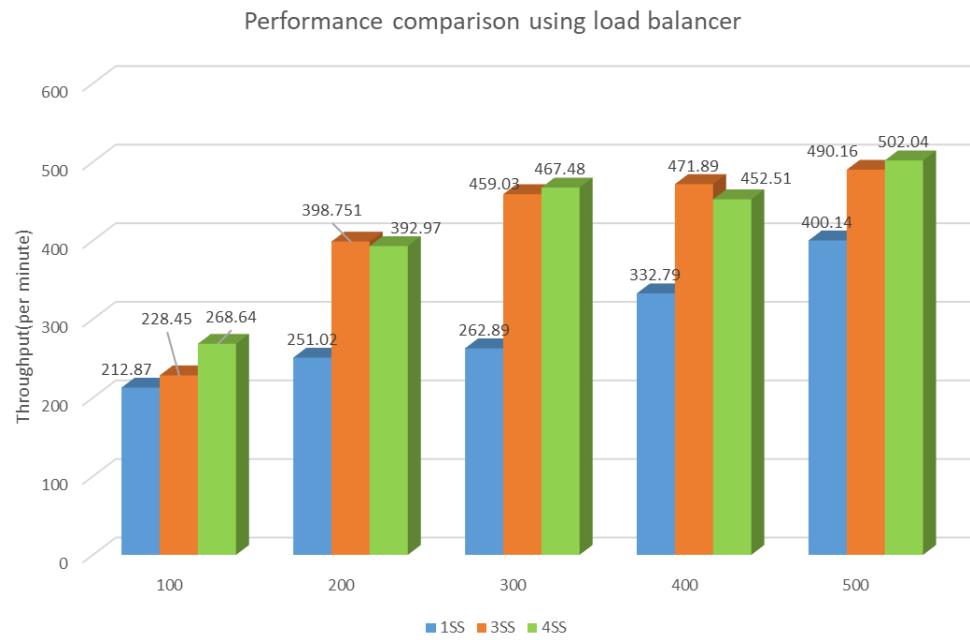
10 passing (2s)

Performance analysis and comparison

- Performance of getAllUsrReviews API was tested with 10,000 reviews with and without distributed systems across various combinations.
- Performance improved by horizontally upscaling the number of servers in the load balancer configuration.
- Redis drastically increased performance due to caching.
- Kafka showed better performance as the request size increased.



As we can see, with less number of users i.e. 100 and 200, base case performed the worst followed by pooling and kafka. Redis outperformed in this scenario, exceeding Kafka's performance. This can be attributed to the fact that Kafka took more time delegating the requests for lesser users. However, when the total number of users increased(300,400,500) we can see that Kafka showed slight performance gain. The message handling mechanism paid off.



When we used multiple load balancers, we can see that with increase in the servers, the overall throughput also increased. This is because the request got distributed amongst multiple servers in round robin fashion, thereby providing a significant performance boost. For 200 and 400 users, we see that 3 servers very slightly outperform, but that result is skewed because of the network latency we were facing. The verdict we reached was that more servers performed better.

Code can be found at the below github repository link:

https://github.com/ruchitadineshentoliya/CMPE273_Indeed.git