CPSC 304 Project Cover Page

Milestone #: ____4___

Date: _2023/12/01_

Group Number: ____64____

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

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Repository Link:

CPSC304-2023W-T1/project h2j2s o1w4p o4g4f (ubc.ca)

A short description of the final project, and what it accomplished:

Short description:

This application is a job portal designed to connect recruiters and job seekers in Canada, streamlining the job-seeking and hiring processes. It utilizes a comprehensive database to manage user profiles, job applications, job posts, scheduled interviews, and career fair participation, facilitating recruitment and efficient information exchange between job seekers and companies.

What it accomplished:

We defined two distinct user roles (Job seekers and Recruiters), each role will have specific permissions to distinct web pages with different functionalities.

They can both sign up with their username, password, name, email, phone number and description, and recruiters can also register with their company's name. They can login later with their username and password.

For Job seekers Specifically:

- View details of all jobs posted and apply directly for positions by submitting their resume and cover letter.
- Create incomplete application packages containing resumes and cover letters and decide whether to submit an application for a specific position later.
- Find the average salary by the job title.
- Find the average salary for each company that have more than one job posted.
- Find the company with recruiters posting jobs exceeding the overall average salary of all job posts.

For Recruiters Specifically:

- View all the applications and applicants' information for the job post they posted and update status of those applications.
- Schedule (create/edit/delete) an interview for a specific application.
- Create new job posts.
- Find all jobseekers who have applied for all jobs posted by them.

Furthermore, there are some extra features on the main page ("Admin Page"):

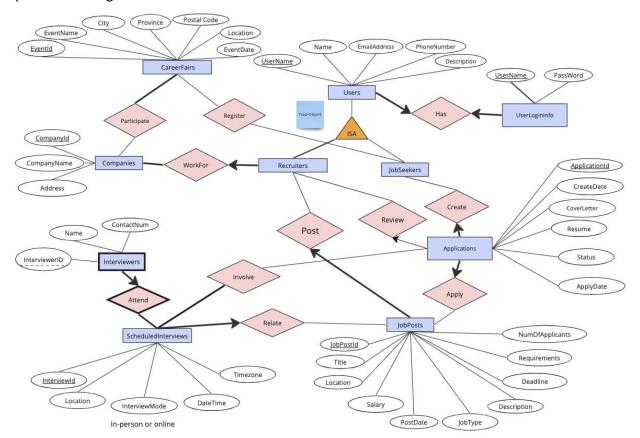
- View all relations in the database by selecting a specific table and the attributes to be viewed.
- Find all users by username, phone number and/or email.

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Count the total number of users, recruiters, job seekers and companies.

Updates:

1. Updated ER Diagram:



2. Updated Schema:

- Users (<u>UserName</u>: varchar, Name: varchar, EmailAddress: varchar, PhoneNumber: varchar, Description: varchar)
- b. Recruiters (**UserName**: varchar, **CompanyId**: integer)
- c. JobSeekers (**UserName**: varchar)
- d. UserLogInfo (<u>UserName</u>: varchar, PassWord: varchar)
- e. Companies (Companyld: integer, CompanyName: varchar, Address: varchar)
- f. JobPosts (<u>JobPostId</u>: integer, **RecruiterId**: varchar, Title: varchar, Location: varchar, Salary: integer, PostDate: DATE, JobType: varchar, Description: varchar, Deadline: DATE, Requirements: varchar, NumOfApplications: integer)
- g. Applications (<u>ApplicationId</u>: integer, **RecruiterId**: varchar, **JobPostId**: integer, CreateDate: DATE, CoverLetter: varchar, **Resume**: varchar, Status: varchar, ApplyDate: DATE)
- h. Resumes (Resume: varchar, JobSeekerld: varchar)

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- i. ScheduledInterviews (<u>interviewId</u>: integer, **JobPostId**: integer, Location: varchar, InterviewMode: char[10], DateTime: DATE, Timezone: varchar)
- j. Applications Scheduledinterviews (InterviewId: integer, ApplicationId: integer)
- k. Interviewers_Attend (<u>Interviewerld</u>: integer, <u>InterviewId</u>: integer, Name: varchar, ContactNum: varchar)
- CareerFairs (<u>EventId</u>: integer, EventName: varchar, **PostalCode**: varchar, Location: varchar, EventDate: DATE)
- m. LocationDetails (<u>PostalCode</u>: varchar, City: varchar, Province: varchar)
- n. Companies CareerFairs (**CompanyId**: integer, **EventId**: integer)
- o. JobSeekers_CareerFairs (<u>JobSeekerld</u>: varchar, <u>Eventld</u>: integer)

Reason: We realized that UserName could be used as a primary and foreign key for Users, Recruiters, and JobSeekers, so we removed the redundant UserId.

Schema and Screenshots of What Data is Present after Reset

SELECT * FROM Users;

	₩ USERNAME \$	□ NAME \$	☐ EMAILADDRESS	□ PHONENUMBER	□ DESCRIPTION ÷
1	john_doe	John Doe	john.doe@email.com	123-456-7890	Description of John
2	jane_smith	Jane Smith	jane.smith@email.com	234-567-8901	Description of Jane
3	michael_johnson	Michael Johnson	michael.johnson@email.com	345-678-9012	Description of Michael
4	emily_brown	Emily Brown	emily.brown@email.com	456-789-0123	Description of Emily
5	william_davis	William Davis	william.davis@email.com	567-890-1234	Description of William
6	olivia_wilson	Olivia Wilson	olivia.wilson@email.com	678-901-2345	Description of Olivia
7	james_miller	James Miller	james.miller@email.com	789-012-3456	Description of James
8	ava_jones	Ava Jones	ava.jones@email.com	890-123-4567	Description of Ava
9	robert_lee	Robert Lee	robert.lee@email.com	901-234-5678	Description of Robert
10	sophia_taylor	Sophia Taylor	sophia.taylor@email.com	012-345-6789	Description of Sophia

SELECT * FROM Recruiters;

	№ USERNAME	‡	COMPANYID	‡
1	john_doe			1
2	jane_smith			2
3	michael_johnson			3
4	emily_brown			4
5	william_davis			5

SELECT * FROM JobSeekers;

	ড়ে <mark>ই</mark> USERNAME ‡
1	ava_jones
2	james_miller
3	olivia_wilson
4	robert_lee
5	sophia_taylor

SELECT * FROM UserLogInfo;

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	□ USERNAME \$	☐ PASSWORD	‡
1	john_doe	\$2y\$10\$QRo.7YRLY/KNtWmK60hipDiD7XdSG.j7NUQctyRTZEc2QGkPcau	
2	jane_smith	\$2y\$10\$2VEuqIx0ypxxuWfUpo5xRuPWYta6Js10I8z440612B8jJzppiP95u	
3	michael_johnson	\$2y\$10\$HPXChvVChoAR4pv23Y3PquFZDkwd4o81KKfq7TZkNSQ01jKgnunvW	
4	emily_brown	\$2y\$10\$fZiia7jm7pWh4UUm9fjkg.EG7gdfn8bg0WzEux7T0isMQ3zg0qmKe	
5	william_davis	\$2y\$10\$VaJLFKuT0Q/1i2Kuv6dl8.fWslpwr8V0k9JqHrxXoOAl8u3QmJIZa	
6	olivia_wilson	\$2y\$10\$I51Gwyladx5.OTvug4xWp0Qn/DPMYAcsUH29Up12mCyDZpy0Fym	
7	james_miller	\$2y\$10\$L7TVIXTraLrTL0312EbUL.z3EhfD/1rk0DW2cnpnIlcFK05eKx652	
8	ava_jones	\$2y\$10\$ppzwzQttaVArbybCIR81S00iv1N.BCEwPp6jGYn1azsAUgzJGeKqS	
9	robert_lee	\$2y\$10\$CZVRiSM3rkNx59QpDmBV5ehDcN1fauo9LuHn05EYezFwJ1HCszW5W	
10	sophia_taylor	\$2y\$10\$PczdYUPS9.47kWEdTi9ny0IdsDmhYBrsm8R7hE7K9jq68N6C7/bc2	

SELECT * FROM Companies;

	COMPANYID ÷	COMPANYNAME ÷	□ ADDRESS	‡
1	1	ABC Inc.	123 Main Street, Vancouver	
2	2	XYZ Corp	456 Elm Avenue, Toronto	
3	3	Tech Solutions Ltd.	789 Oak Lane, Montreal	
4	4	Global Innovations	101 Pine Road, Calgary	
5	5	Acme Industries	222 Cedar Street, Edmonton	

SELECT * FROM JobPosts;

	<u></u> JOBPOSTID ≎	RECRUITERID :	☐ TITLE ÷	□ LOCATION ÷	□ SALARY ÷	□ POSTDATE	□ JOBTYPE □	☐ DESCRIPTION ÷	☐ DEADLINE ÷	□ NUMOFAPPLICATIONS ÷	☐ REQUIREMENTS
1	1	john_doe	Software Engineer	Online	80000	2023-10-18	Full-time	We are looking fo	2023-11-15		4 Bachelor's degree in Computer Science, Proficier
2	2	jane_smith	Marketing Manager	456 Elm Avenu	76000	2023-10-19	Full-time	We need an experi	2023-11-20	:	l Bachelor's degree in Marketing, 5+ years of mark
3	3	michael_johnson	Data Analyst	123 Main Stre	30000	2023-10-19	Internship	We are hiring a d	2023-11-10	:	l Strong data analysis skills, familiarity with Py
4	4	emily_brown	Graphic Designer	Online	66000	2023-10-21	Full-time	Looking for a cre	2023-11-25	:	1 Graphic design experience, proficiency in Adobe
5	5	william_davis	Product Manager	101 Pine Road	45000	2023-10-22	Full-time	We are seeking a	2023-11-30		Excellent communication skills, product manageme
6	6	john_doe	Product Manager	Online	98008	2023-11-05	Full-time	Looking for an ex	2023-12-05	;	5+ years of product management experience, strom
7	7	john_doe	Data Analyst	Online	85000	2023-11-10	Full-time	We are hiring a d	2023-12-10		4 Ph.D. in Computer Science, experience with mach:
8	8	william_davis	Data Analyst	101 Pine Road	55000	2023-10-22	Full-time	We are seeking a	2023-11-30		Excellent coding skills
9	9	jane_smith	Product Manager	456 Elm Avenu	60000	2023-10-19	Full-time	We need an experi	2023-11-20		Bachelor's degree in Business/STEM, 3+ years of

SELECT * FROM Applications;

		RECRUITERID :	☐ JOBPOSTID ÷	☐ CREATEDATE	COVERLETTER		□ STATUS	□ APPLYDATE
1	1	john_doe	1	2023-10-19	http://example.com/coverletter1-olivia_wilson	http://example.com/resume1-olivia_wilson	Under Review	2023-10-20
2	2	jane_smith	2	2023-10-20	<null></null>	http://example.com/resume1-james_miller	Interviewing	2023-10-20
3	3	michael_johnson	3	2023-10-21	http://example.com/coverletter1-ava_jones	http://example.com/resume1-ava_jones	Interviewing	2023-10-22
4	4	emily_brown	4	2023-10-30	http://example.com/coverletter1-robert_lee	http://example.com/resume1-robert_lee	Accepted	2023-10-30
5	5	<null></null>	<null></null>	2023-10-10	http://example.com/coverletter1-sophia_taylor	http://example.com/resume1-sophia_taylor	Incomplete application	<null></null>
6	6	john_doe	6	2023-11-02	http://example.com/coverletter2-olivia_wilson	http://example.com/resume1-olivia_wilson	Under Review	2023-11-03
7	7	john_doe	7	2023-11-06	http://example.com/coverletter3-olivia_wilson	http://example.com/resume1-olivia_wilson	Under Review	2023-11-07
8	8	john_doe	6	2023-11-15	http://example.com/coverletter1-james_miller	http://example.com/resume1-james_miller	Under Review	2023-11-16
9	9	john_doe	7	2023-11-18	http://example.com/resume2-james_miller	http://example.com/resume1-james_miller	Under Review	2023-11-19
10	10	john_doe	6	2023-11-11	http://example.com/coverletter2-ava_jones	http://example.com/resume1-ava_jones	Under Review	2023-11-12
11	11	john_doe	7	2023-11-11	http://example.com/coverletter3-ava_jones	http://example.com/resume1-ava_jones	Under Review	2023-11-12
12	12	john_doe	7	2023-11-20	<null></null>	http://example.com/resume1-robert_lee	Under Review	2023-11-21
13	13	john_doe	1	2023-11-06	http://example.com/coverletter4-ava_jones	http://example.com/resume1-ava_jones	Under Review	2023-11-07
14	14	john_doe	1	2023-11-15	http://example.com/coverletter1-james_miller	http://example.com/resume1-james_miller	Under Review	2023-11-16
15	15	john_doe	1	2023-11-15	<null></null>	http://example.com/resume1-robert lee	Under Review	2023-11-16

SELECT * FROM Resumes;

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	₽ RESUME \$	□ JOBSEEKERID ÷
1	http://example.com/resume1-olivia_wilson	olivia_wilson
2	http://example.com/resume1-james_miller	james_miller
3	http://example.com/resume1-ava_jones	ava_jones
4	http://example.com/resume1-robert_lee	robert_lee
5	http://example.com/resume1-sophia_taylor	sophia_taylor

SELECT * FROM Applications_ScheduledInterviews;

	ু INTERVIEWID ≑	♣ APPLICATIONID ‡
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5

SELECT * FROM Interviewers_Attend;

	<pre>INTERVIEWERID </pre>	№ INTERVIEWID ÷	□ NAME ÷	□ CONTACTNUM ÷
1	1	1	Anna	111-111-2222
2	2	2	Jone	222-222-3333
3	3	3	Sandrew	333-333-4444
4	4	4	Peter	444-444-5555
5	5	5	Jack	555-555-6666

SELECT * FROM CareerFairs;

	<u></u> EVENTID ≎	☐ EVENTNAME \$	POSTALCODE ÷	□ LOCATION ÷	□ EVENTDATE
1	1	BusinessCareerFair2023	V6T1Z1	University of British Columbia	2023-10-10
2	2	TechnicalCareerFair2024	M5R0A3	University of Toronto	2024-01-10
3	3	EngineerCareerFair2024	T6G2R3	University of Alberta	2024-09-10
4	4	TechnicalCareerFair2023	V6T1Z4	University of British Columbia	2023-05-10
5	5	EngineerCareerFair2023	V6T1Z2	University of British Columbia	2023-05-10

SELECT * FROM LocationDetails;

	₽ POSTALCODE \$	□ CITY ÷	□ PROVINCE
1	V6T1Z1	Vancouver	BC
2	M5R0A3	Toronto	ON
3	T6G2R3	Edmonton	AB
4	V6T1Z4	Vancouver	BC
5	V6T1Z2	Vancouver	BC

SELECT * FROM Companies_CareerFairs;

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	₩ COMPANYID	‡	₩ EVENTID	‡
1		1		1
2		2		2
3		3		3
4		4		4
5		5		5

SELECT * FROM JobSeekers_CareerFairs;

	₩ JOBSEEKERID	‡	₩ EVENTID	‡
1	ava_jones			3
2	james_miller			2
3	olivia_wilson			1
4	robert_lee			4
5	sophia_taylor			5

List of all SQL queries

INSERT

project_h2j2s_o1w4p_o4g4f/job_portal.php, line 189

```
insert into UserLogInfo values (:bind1, :bind2)
```

project h2j2s o1w4p o4g4f/job portal.php, line 207

insert into Users values (:bind1, :bind2, :bind3, :bind4, :bind5)

project h2j2s o1w4p o4g4f/job portal.php, line 218

insert into JobSeekers values (:bind1)

project h2j2s o1w4p o4g4f/job portal.php, line 229

insert into Companies values (CompanyId_Sequence.nextval, :bind1, :bind2)

project h2j2s o1w4p o4g4f/job portal.php, line 246

insert into Recruiters values (:bind1, :bind2)

DELETE

project_h2j2s_o1w4p_o4g4f/recruiter.php, line 421

DELETE FROM ScheduledInterviews WHERE InterviewId = {\$interviewId}

UPDATE

project_h2j2s_o1w4p_o4g4f/recruiter.php, lines 468-474

```
UPDATE ScheduledInterviews
SET JobPostId = :bind1,
```

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```
Location = :bind2,
           InterviewMode = :bind3,
           DateTime = TO_DATE(:bind4, 'YYYY-MM-DD\"T\"HH24:MI'),
           TimeZone = :bind5
       WHERE InterviewId ='{$interviewId}'
project h2j2s o1w4p o4g4f/recruiter.php, lines 479-481
UPDATE APPLICATIONS
       SET JobPostId = :bind1
       WHERE ApplicationId ='{$applicationId}'
project h2j2s o1w4p o4g4f/recruiter.php, lines 485-487
UPDATE JOBPOSTS
       SET JobPosts.NumOfApplications = JobPosts.NumOfApplications + 1
       WHERE JobPostId ='{$ POST['interviewJobPostId']}'
project h2j2s o1w4p o4g4f/recruiter.php, lines 490-492
UPDATE JOBPOSTS
            SET JobPosts.NumOfApplications = JobPosts.NumOfApplications - 1
           WHERE JobPostId ='$currentJobPostId'
```

SELECTION

project h2j2s o1w4p o4g4f/find user.php, lines 280-294

```
$query = "SELECT * FROM Users";

if ($attribute1 != 'None' && !empty($val1)) {
    $query .= " WHERE $attribute1 = '$val1'";
}

if ($attribute2 != 'None' && !empty($val2)) {
    $query .= " $attribute2 = '$val2'";
}

if ($attribute3 != 'None' && !empty($val3)) {
    $query .= " $attribute3 = '$val3'";
}

$result = executePlainSQL($query);
```

PROJECTION

```
project_h2j2s_o1w4p_o4g4f/job_portal_view.php, line 49

SELECT table_name FROM all_tables WHERE owner = 'ORA_XLI2801'

project h2j2s o1w4p o4g4f/job portal view.php, line 58
```

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```
SELECT column_name FROM all_tab_columns WHERE table_name = '$selectedTable' AND owner = 'ORA_XLI2801'

project_h2j2s_o1w4p_o4g4f/job_portal_view.php, line 223

"SELECT ". $attributes . " FROM ". $_GET["selectedTable"]
```

JOIN

project h2j2s o1w4p o4g4f/recruiter.php, lines 267-282

```
SELECT
           Applications.ApplicationId,
           Applications.JobPostId,
           Users.Name AS JobSeekerName,
           Applications.Resume,
           Applications.CoverLetter,
           Applications.Status,
           Applications.CreateDate,
           Applications.ApplyDate
       FROM
           Applications
       JOIN Resumes ON Resumes.Resume = Applications.Resume
       JOIN Users ON Resumes.JobSeekerId = Users.UserName
       WHERE
           Applications.RecruiterId = '$username'
           AND Applications.Status <> 'Incomplete application'
```

AGGREGATION with GROUP BY

project h2j2s o1w4p o4g4f/job seeker.php, lines 689-691

```
SELECT Title, AVG(Salary) AS AvgSalary

FROM JobPosts

GROUP BY TITLE
```

AGGREGATION with HAVING

project h2j2s o1w4p o4g4f/job seeker.php, lines 741-747

```
SELECT C.CompanyId AS CompanyId, C.CompanyName AS CompanyName, AVG(JP.Salary) AS

AvgSalary

FROM Companies C, Recruiters R, JobPosts JP

WHERE C.CompanyId = R.CompanyId

AND R.UserName = JP.RecruiterId

GROUP BY C.CompanyId, C.CompanyName

HAVING COUNT(*) > 1

ORDER BY AvgSalary DESC
```

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NESTED AGGREGATION with GROUP BY

project_h2j2s_o1w4p_o4g4f/job_seeker.php, lines 799-805

```
SELECT C.CompanyId AS COMPANYID, C.CompanyName AS COMPANYNAME, AVG(JP.Salary) AS

AvgSalary

FROM Companies C, Recruiters R, JobPosts JP

WHERE C.CompanyId = R.CompanyId AND R.UserName = JP.RecruiterId

GROUP BY C.CompanyId, C.CompanyName

HAVING AVG(JP.Salary) > (SELECT

AVG(Salary)

FROM JobPosts)
```

DIVISION

project_h2j2s_o1w4p_o4g4f/recruiter.php, lines 876-886

```
SELECT JS.UserName AS JobSeekerUserName

FROM JobSeekers JS

WHERE NOT EXISTS

(( SELECT JP.JobPostId

FROM JobPosts JP

WHERE JP.recruiterId = '$username')

MINUS

(SELECT A.JobPostId

FROM Applications A, Resumes R

WHERE A.Resume = R.Resume

AND R.JobSeekerId = JS.UserName))
```

Screenshots demonstrating the functionality of each query

1. Insert Operation

Before:

Users Table:

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USERNAME	NAME	EMAILADDRESS	PHONENUMBER	DESCRIPTION
john_doe	John Doe	john.doe@email.com	123-456-7890	Description of John
jane_smith	Jane Smith	jane.smith@email.com	234-567-8901	Description of Jane
michael_johnson	Michael Johnson	michael.johnson@email.com	345-678-9012	Description of Michael
emily_brown	Emily Brown	emily.brown@email.com	456-789-0123	Description of Emily
william_davis	William Davis	william.davis@email.com	567-890-1234	Description of William
olivia_wilson	rilson Olivia Wilson olivia.wilson@email.com		678-901-2345	Description of Olivia
james_miller	James Miller	james.miller@email.com	789-012-3456	Description of James
ava_jones	Ava Jones	ava.jones@email.com	890-123-4567	Description of Ava
robert_lee	Robert Lee	robert.lee@email.com	901-234-5678	Description of Robert
sophia_taylor	Sophia Taylor	sophia.taylor@email.com	012-345-6789	Description of Sophia

UserLogInfo Table:

USERNAME	NAME	EMAILADDRESS	PHONENUMBER	DESCRIPTION	
john_doe John Doe		john.doe@email.com	123-456-7890	Description of John	
jane_smith	Jane Smith	jane.smith@email.com	234-567-8901	Description of Jane	
michael_johnson	Michael Johnson	michael.johnson@email.com	345-678-9012	Description of Michael	
emily_brown Emily Brown emily.brown@email.com		456-789-0123	Description of Emily		
william_davis William Davis william.davis@email.com		567-890-1234	Description of William		
olivia_wilson Olivia Wilson olivia.wilson@email.com		olivia.wilson@email.com	678-901-2345	Description of Olivia	
james_miller James Miller james.mil		james.miller@email.com	789-012-3456	Description of James	
ava_jones	Ava Jones	ava.jones@email.com	890-123-4567	Description of Ava	
robert_lee Robert Lee robert.lee@email.com		901-234-5678	Description of Robert		
sophia_taylor Sophia Taylor sophia.taylor@email.com 0		012-345-6789	Description of Sophia		

JobSeekers Table:

USERNAME		
ava_jones		
james_miller		
olivia_wilson		
robert_lee		
sophia_taylor		

<u>During:</u>

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User Sign-up

Username* harper_white
Password*
User Type* ☐Job Seeker ✓
Name* Harper White
Email Address* harper.white@email.com
Phone Number (Eg. 123-456-7890) 666-666-3333
Description Description of Harper
Sign Up

<u>After:</u>

Users Table:

USERNAME	NAME	EMAILADDRESS	PHONENUMBER	DESCRIPTION	
harper_white	Harper White	harper.white@email.com	666-666-3333	Description of Harper	
john_doe	John Doe	john.doe@email.com	123-456-7890	Description of John	
jane_smith	Jane Smith	jane.smith@email.com	234-567-8901	Description of Jane	
michael_johnson	Michael Johnson	michael.johnson@email.com	m 345-678-9012 Description of M		
emily_brown	Emily Brown	emily.brown@email.com	456-789-0123	Description of Emily	
william_davis	William Davis	william.davis@email.com	567-890-1234	Description of William	
olivia_wilson	Olivia Wilson	olivia.wilson@email.com	678-901-2345	Description of Olivia	
james_miller	James Miller	james.miller@email.com	789-012-3456	Description of James	
ava_jones	Ava Jones	ava.jones@email.com	890-123-4567	Description of Ava	
robert_lee	Robert Lee	robert.lee@email.com	901-234-5678	Description of Robert	
sophia_taylor	Sophia Taylor	sophia.taylor@email.com	012-345-6789	Description of Sophia	

UserLogInfo Table:

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USERNAME	PASSWORD		
harper_white	\$2y\$10\$5ky0Jq0s7XQOCEtD8QAUruKjYxN3z8rrnU/O3w0IaUZ3TwiQdQfAm		
john_doe	\$2y\$10\$QRo.7YRLY/KNtWmK60hipDiD7XdSG.j7NUQctyRTZEc2QGkPcau		
jane_smith	\$2y\$10\$2VEuqIx0ypxxuWfUpo5xRuPWYta6Js10I8z44O612B8jJzppiP95u		
michael_johnson	\$2y\$10\$HPXChvVChoAR4pv23Y3PquFZDkwd4o81KKfq7TZkNSQO1jKgnunvW		
emily_brown	\$2y\$10\$fZiia7jm7pWh4UUm9fjkg.EG7gdfn8bg0WzEux7TOisMQ3zgOqmKe		
william_davis	\$2y\$10\$VaJLFKuT0Q/1i2Kuv6dl8.fWslpwr8VOk9JqHrxXoOAl8u3QmJIZa		
olivia_wilson	\$2y\$10\$I51Gwyladx5.OTvug4xWpOQn/DPMYAcsUH29Up12mCyDZpy0Fym		
james_miller	\$2y\$10\$L7TVIXTraLrTL0312EbUL.z3EhfD/1rk0DW2cnpnIlcFK05eKx652		
ava_jones	\$2y\$10\$ppzwzQttaVArbybCIR81SOOiv1N.BCEwPp6jGYn1azsAUgzJGeKqS		
robert_lee	\$2y\$10\$CZVRiSM3rkNx59QpDmBV5ehDcN1fauo9LuHnO5EYezFwJ1HCszW5W		
sophia_taylor	\$2y\$10\$PczdYUPS9.47kWEdTi9nyOIdsDmhYBrsm8R7hE7K9jq68N6C7/bc2		

JobSeekers Table:

USERNAME		
ava_jones		
harper_white		
james_miller		
olivia_wilson		
robert_lee		
sophia_taylor		

2. Delete Operation

<u>Before:</u>

ScheduledInterviews Table:

INTERVIEWID	JOBPOSTID	LOCATION	INTERVIEWMODE	DATETIME	TIMEZONE
1	1	123 Main St, City1	In-Person	28-OCT-23	PST
2	2	143 Main St, City2	In-Person	25-OCT-23	EST
3	3	https://zoom.us/j/123	Online	15-OCT-23	ADT
4	4	193 University St, City4	In-Person	25-OCT-23	CDT
5	5	https://zoom.us/j/456	Online	10-OCT-23	MST

Applications_ScheduledInterviews Table:

Department of Computer Science

INTERVIEWID	APPLICATIONID
1	1
2	2
3	3
4	4
5	5

Interviewers_Attend Table:

INTERVIEWERID	INTERVIEWID	NAME	CONTACTNUM
1	1	Anna	111-111-2222
2	2	Jone	222-222-3333
3	3	Sandrew	333-333-4444
4	4	Peter	444-444-5555
5	5	Jack	555-555-6666

GUI:

The recruiter who logged in (username: john_doe password: johnpassword123):

Hi! john_doe

Recruiter Reviews Applications

Review

Scheduling interview for Application ID: 1

Scheduled Interviews

Interview Id	Job Post Id	Location	Interview Mode	Date and Time	Timezone	Interviewer Info	Actions
1	1	123 Main St, City1	In-Person	October 28, 2023 10:00 AM	PST	ID: 1 Name: Anna Contact: 111-111-2222	Edit Delete

1 interview

Create New Interview

During:

Click the Delete button in the Actions column

Department of Computer Science

Recruiter Reviews Applications

Review

Scheduling interview for Application ID: 1

Scheduled Interviews

Interview	Id Job Post Id	Location	Interview Mode	Date and Time	Timezone	Interviewer Info	Actions
1	1	123 Main St, City1	In-Person	October 28, 2023 10:00 AM	PST	ID: 1 Name: Anna Contact: 111-111-2222	Edit

1 interview

Create New Interview

After:

ScheduledInterviews Table:

INTERVIEWID	JOBPOSTID	LOCATION	INTERVIEWMODE	DATETIME	TIMEZONE
2	2	143 Main St, City2	In-Person	25-OCT-23	EST
3	3	https://zoom.us/j/123	Online	15-OCT-23	ADT
4	4	193 University St, City4	In-Person	25-OCT-23	CDT
5	5	https://zoom.us/j/456	Online	10-OCT-23	MST

Applications_ScheduledInterviews Table:

INTERVIEWID	APPLICATIONID
2	2
3	3
4	4
5	5

Interviewers_Attend Table:

INTERVIEWERID	INTERVIEWID	NAME	CONTACTNUM
2	2	Jone	222-222-3333
3	3	Sandrew	333-333-4444
4	4	Peter	444-444-5555
5	5	Jack	555-555-6666

GUI:

Department of Computer Science

Recruiter Reviews Applications

Review

deleting interview for interview ID: 1

Interview was deleted successfully!

Recruiter Reviews Applications

Review

Scheduling interview for Application ID: 1

Scheduled Interviews

Interview Id	Job Post Id	Location In	terview Mode	Date and Time	Timezone	Interviewer Info	Actions
0 interview							

Create New Interview

3. Update Operation

Before (choose username: jane smith password: janepassword456! to login and update the interview with id 2)

Scheduled Interviews

Inte	rview Id	Job Post Id	Location	Interview Mode	Date and Time	Timezone	Interviewer Info	Actions
2		2	143 Main St, City2	In-Person	October 25, 2023 11:00 AM	HST I	ID: 2 Name: Jone Contact: 222-222-3333	Edit Delete

1 interview

ScheduledInterview Table:

INTERVIEWID	JOBPOSTID	LOCATION	INTERVIEWMODE	DATETIME	TIMEZONE
1	1	123 Main St, City1	In-Person	28-OCT-23	PST
2	2	143 Main St, City2	In-Person	25-OCT-23	EST
3	3	https://zoom.us/j/123	Online	15-OCT-23	ADT
4	4	193 University St, City4	In-Person	25-OCT-23	CDT
5	5	https://zoom.us/j/456	Online	10-OCT-23	MST

During:

Recruiter Reviews Applications

Editing interview for id: 2
Interview ID: 2
Job Post Id*: 9
Location*: https://zoom.us/j/666
Interview Mode*: Online
Date and Time*: 2023-12-01, 11:00 AM
Timezone*: PST
Save Changes

After:

Scheduled Interviews

Interview Id	Job Post Id	Location	Interview Mode	Date and Time	Timezone	Interviewer Info	Actions
2	9	https://zoom.us/j/666	Online	December 1, 2023 11:00 AM	TZQ	ID: 2 Name: Jone Contact: 222-222-3333	Edit Delete

¹ interview

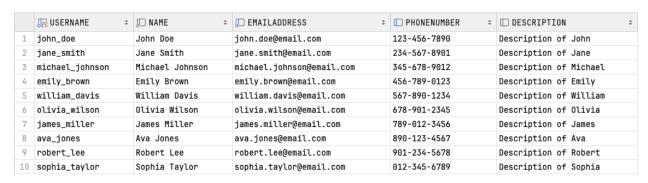
ScheduledInterviews Table:

INTERVIEWID	JOBPOSTID	LOCATION	INTERVIEWMODE	DATETIME	TIMEZONE
1	1	123 Main St, City1	In-Person	28-OCT-23	PST
2	9	https://zoom.us/j/666	Online	01-DEC-23	PST
3	3	https://zoom.us/j/123	Online	15-OCT-23	ADT
4	4	193 University St, City4	In-Person	25-OCT-23	CDT
5	5	https://zoom.us/j/456	Online	10-OCT-23	MST

4. Selection Operation

Before:

Department of Computer Science



During:

Click Find Users on the home page:

Find User(s)

Find User(s)

Find User(s)

1st Attribute: Name ✓ = John Doe
2nd Attribute: OR EmailAddress
3rd Attribute: None ▼ =
Find User(s)
Go Back to Main Page

After:

UserName			Phone Number	Description
john_doe	John Doe	john.doe@email.com	123-456-7890	Description of John
jane_smith	Jane Smith	jane.smith@email.com	234-567-8901	Description of Jane

5. Projection Operation

Before (choose JobPosts as an example):

Department of Computer Science



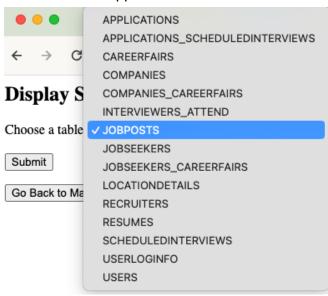
During:

Click View All Tables on the home page:

View All Table

View All Table

Select the table Applications and Click submit



Department of Computer Science

Display Selected Attributes from Selected Table

Choose attribute(s) for JOBPOSTS:

JOBPOSTID

RECRUITERID

TITLE

LOCATION

SALARY

POSTDATE

JOBTYPE

DESCRIPTION

DEADLINE

REQUIREMENTS

NUMOFAPPLICATIONS

Submit

Go back to select table

After:

TITLE	LOCATION	SALARY	JOBTYPE	DESCRIPTION	DEADLINE	REQUIREMENTS	NUMOFAPPLICATIONS
Software Engineer	Online	80000		We are looking for a software engineer with strong programming skills.	15-NOV-23	Bachelor's degree in Computer Science, Proficiency in Java, 2+ years of experience	4
	456 Elm Avenue, Toronto	70000		We need an experienced marketing manager to lead our marketing team.	20-NOV-23	Bachelor's degree in Marketing, 5+ years of marketing experience	1
Data Analyst	123 Main Street, Vancouver	30000	Internship	We are hiring a data analyst intern for a short-term project.	10-NOV-23	Strong data analysis skills, familiarity with Python and database	1
Graphic Designer	Online	66000		Looking for a creative graphic designer to work on various design projects.	25-NOV-23	Graphic design experience, proficiency in Adobe Creative Suite	1
Customer Support Representative	101 Pine Road, Calgary	45000		We are seeking a customer support representative to assist our customers.	30-NOV-23	Excellent communication skills, customer service experience	0
Product Manager	Online	90000		Looking for an experienced product manager to lead product development.	05-DEC-23	5+ years of product management experience, strong leadership skills	3
Data Analyst	Online	85000		We are hiring a data analyst with expertise in machine learning.	10-DEC-23	Ph.D. in Computer Science, experience with machine learning algorithms	4
Data Analyst	101 Pine Road, Calgary	55000	Full-time	We are seeking a data analyst with Python and R skills.	30-NOV-23	Excellent coding skills	0
Product Manager	456 Elm Avenue, Toronto	60000		We need an experienced product manager to lead our development team.	20-NOV-23	Bachelor's degree in Business/STEM, 3+ years of management experience	О

6. Join

Before:

Applications Table:

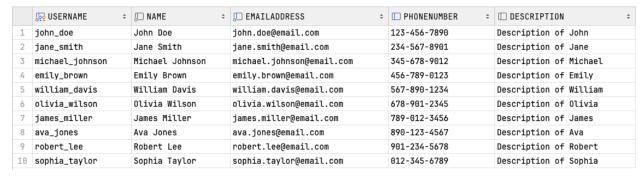
	📭 APPLICATIONID : 🕞	RECRUITERID ÷	☐ JOBPOSTID ÷	☐ CREATEDATE	☐ COVERLETTER		□ STATUS	□ APPLYDATE
1	1 joh	in_doe	1	2023-10-19	http://example.com/coverletter1-olivia_wilson	http://example.com/resume1-olivia_wilson	Under Review	2023-10-20
2	2 jan	e_smith	2	2023-10-20	<null></null>	http://example.com/resume1-james_miller	Interviewing	2023-10-20
3	3 mic	hael_johnson	3	2023-10-21	http://example.com/coverletter1-ava_jones	http://example.com/resume1-ava_jones	Interviewing	2023-10-22
4	4 emi	ly_brown	4	2023-10-30	http://example.com/coverletter1-robert_lee	http://example.com/resume1-robert_lee	Accepted	2023-10-30
5	5 <nu< td=""><td>II></td><td><null></null></td><td>2023-10-10</td><td>http://example.com/coverletter1-sophia_taylor</td><td>http://example.com/resume1-sophia_taylor</td><td>Incomplete application</td><td><null></null></td></nu<>	II>	<null></null>	2023-10-10	http://example.com/coverletter1-sophia_taylor	http://example.com/resume1-sophia_taylor	Incomplete application	<null></null>
5	6 joh	in_doe	6	2023-11-02	http://example.com/coverletter2-olivia_wilson	http://example.com/resume1-olivia_wilson	Under Review	2023-11-03
7	7 joh	in_doe	7	2023-11-06	http://example.com/coverletter3-olivia_wilson	http://example.com/resume1-olivia_wilson	Under Review	2023-11-07
В	8 joh	in_doe	6	2023-11-15	http://example.com/coverletter1-james_miller	http://example.com/resume1-james_miller	Under Review	2023-11-16
9	9 joh	in_doe	7	2023-11-18	http://example.com/resume2-james_miller	http://example.com/resume1-james_miller	Under Review	2023-11-19
.0	10 joh	in_doe	6	2023-11-11	http://example.com/coverletter2-ava_jones	http://example.com/resume1-ava_jones	Under Review	2023-11-12
1	11 joh	in_doe	7	2023-11-11	http://example.com/coverletter3-ava_jones	http://example.com/resume1-ava_jones	Under Review	2023-11-12
.2	12 joh	in_doe	7	2023-11-20	<null></null>	http://example.com/resume1-robert_lee	Under Review	2023-11-21
3	13 joh	in_doe	1	2023-11-06	http://example.com/coverletter4-ava_jones	http://example.com/resume1-ava_jones	Under Review	2023-11-07
4	14 joh	in_doe	1	2023-11-15	http://example.com/coverletter1-james_miller	http://example.com/resume1-james_miller	Under Review	2023-11-16
1.5	15 1oh	in doe	1	2023-11-15	<nu11></nu11>	http://example.com/resume1-robert lee	Under Review	2023-11-16

Resumes Table:

Department of Computer Science

	□ RESUME	□ JOBSEEKERID \$
1	http://example.com/resume1-olivia_wilson	olivia_wilson
2	http://example.com/resume1-james_miller	james_miller
3	http://example.com/resume1-ava_jones	ava_jones
4	http://example.com/resume1-robert_lee	robert_lee
5	http://example.com/resume1-sophia_taylor	sophia_taylor

Users Table:



During:

The recruiter who logged in (username: john_doe password: johnpassword123):

Hi! john_doe

Recruiter Reviews Applications

Review

After:

Department of Computer Science

App	plicati	ons
K-)		

Application ID	Job Post ID	Job Seeker Name	Resume	Cover Letter	Status	Create Date	Apply Date	Action
1	1	Olivia Wilson	Resume	Cover Letter	Under Review ✔	19-OCT-23	20-OCT-23	Schedule Interview
6	6	Olivia Wilson	Resume	Cover Letter	Under Review ➤	02-NOV-23	03-NOV-23	Schedule Interview
7	7	Olivia Wilson	Resume	Cover Letter	Under Review ➤	06-NOV-23	07-NOV-23	Schedule Interview
8	6	James Miller	Resume	Cover Letter	Under Review ➤	15-NOV-23	16-NOV-23	Schedule Interview
9	7	James Miller	Resume	Cover Letter	Under Review ➤	18-NOV-23	19-NOV-23	Schedule Interview
10	6	Ava Jones	Resume	Cover Letter	Under Review ➤	11-NOV-23	12-NOV-23	Schedule Interview
11	7	Ava Jones	Resume	Cover Letter	Under Review ➤	11-NOV-23	12-NOV-23	Schedule Interview
12	7	Robert Lee	Resume		Under Review ➤	20-NOV-23	21-NOV-23	Schedule Interview
13	1	Ava Jones	Resume	Cover Letter	Under Review ➤	06-NOV-23	07-NOV-23	Schedule Interview
14	1	James Miller	Resume	Cover Letter	Under Review ➤	15-NOV-23	16-NOV-23	Schedule Interview
15	1	Robert Lee	Resume		Under Review ➤	15-NOV-23	16-NOV-23	Schedule Interview

Save

7. Aggregation with Group By

Before:

JobPosts Table:

	<u>I</u> JOBPOSTID ≎	RECRUITERID :	∏ TITLE ÷	□ LOCATION ÷	□ SALARY ÷	□ POSTDATE :	□ JOBTYPE ÷	□ DESCRIPTION	□ DEADLINE ÷	□ NUMOFAPPLICATIONS :	☐ REQUIREMENTS
1	1	john_doe	Software Engineer	Online	80000	2023-10-18	Full-time	We are looking fo	2023-11-15		4 Bachelor's degree in Computer Science, Proficier
2	2	jane_smith	Marketing Manager	456 Elm Avenu.	78008	2023-10-19	Full-time	We need an experi	2023-11-20		1 Bachelor's degree in Marketing, 5+ years of mark
3	3	michael_johnson	Data Analyst	123 Main Stre	38008	2023-10-19	Internship	We are hiring a d	2023-11-10		1 Strong data analysis skills, familiarity with Py
4	4	emily_brown	Graphic Designer	Online	66008	2023-10-21	Full-time	Looking for a cre	2023-11-25		1 Graphic design experience, proficiency in Adobe
5	5	william_davis	Product Manager	101 Pine Road	45000	2023-10-22	Full-time	We are seeking a	2023-11-30		B Excellent communication skills, product manageme
6	6	john_doe	Product Manager	Online	98008	2023-11-05	Full-time	Looking for an ex	2023-12-05		3 5+ years of product management experience, strom
7	7	john_doe	Data Analyst	Online	85000	2023-11-10	Full-time	We are hiring a d	2023-12-10		4 Ph.D. in Computer Science, experience with mach:
8	8	william_davis	Data Analyst	101 Pine Road	55000	2023-10-22	Full-time	We are seeking a	2023-11-30		B Excellent coding skills
9	9	jane_smith	Product Manager	456 Elm Avenu	60000	2023-10-19	Full-time	We need an experi	2023-11-20		Bachelor's degree in Business/STEM, 3+ years of

During:

Any job seeker can log in to view the results. (Eg. username: olivia_wilson password: oliviapassword789)

Find the Average Salary by Job Title

Find

After:

Department of Computer Science

Job Title	Average Salary
Customer Support Representative	45000
Product Manager	75000
Data Analyst	56666.666666666666666666666666666666666
Graphic Designer	66000
Software Engineer	80000
Marketing Manager	70000

8. Aggregation with Having

<u>Before:</u>

Companies Table:

	∏ COMPANYID ‡	COMPANYNAME ÷	□ ADDRESS	‡
1	1	ABC Inc.	123 Main Street, Vancouver	
2	2	XYZ Corp	456 Elm Avenue, Toronto	
3	3	Tech Solutions Ltd.	789 Oak Lane, Montreal	
4	4	Global Innovations	101 Pine Road, Calgary	
5	5	Acme Industries	222 Cedar Street, Edmonton	

Recruiters Table:

	№ USERNAME	‡	COMPANYID	‡
1	john_doe			1
2	jane_smith			2
3	michael_johnson			3
4	emily_brown			4
5	william_davis			5

JobPosts Table:

	U JOBPOSTID ÷	RECRUITERID :	☐ TITLE ÷	□ LOCATION ÷	☐ SALARY ÷	□ POSTDATE ÷	□ JOBTYPE ÷	□ DESCRIPTION	☐ DEADLINE ÷	□ NUMOFAPPLICATIONS ÷	☐ REQUIREMENTS
1	1	john_doe	Software Engineer	Online	80000	2023-10-18	Full-time	We are looking fo	2023-11-15		Bachelor's degree in Computer Science, Proficier
2	2	jane_smith	Marketing Manager	456 Elm Avenu	70000	2023-10-19	Full-time	We need an experi	2023-11-20		Bachelor's degree in Marketing, 5+ years of mark
3	3	michael_johnson	Data Analyst	123 Main Stre	30000	2023-10-19	Internship	We are hiring a d	2023-11-10	:	Strong data analysis skills, familiarity with Py
4	4	emily_brown	Graphic Designer	Online	66000	2023-10-21	Full-time	Looking for a cre	2023-11-25		Graphic design experience, proficiency in Adobe
5	5	william_davis	Product Manager	101 Pine Road	45000	2023-10-22	Full-time	We are seeking a	2023-11-30		Excellent communication skills, product manageme
6	6	john_doe	Product Manager	Online	90000	2023-11-05	Full-time	Looking for an ex	2023-12-05		5+ years of product management experience, strop
7	7	john_doe	Data Analyst	Online	85000	2023-11-10	Full-time	We are hiring a d	2023-12-10		Ph.D. in Computer Science, experience with mach:
8	8	william_davis	Data Analyst	101 Pine Road	55000	2023-10-22	Full-time	We are seeking a	2023-11-30		Excellent coding skills
9	9	jane_smith	Product Manager	456 Elm Avenu	60000	2023-10-19	Full-time	We need an experi	2023-11-20		Bachelor's degree in Business/STEM, 3+ years of

During:

Any job seeker can log in to view the results. (Eg. username: olivia_wilson password: oliviapassword789)

Department of Computer Science

Find the Average Salary for Each Company That Have More Than One Job Posted

Find

<u>After:</u>

Company Id	Company Name	Average Salary
1	ABC Inc.	85000
2	XYZ Corp	65000
5	Acme Industries	50000

9. Nested Aggregation with Group By

Before:

Companies Table:

	∏ COMPANYID ‡	COMPANYNAME ÷	□ ADDRESS	‡
1	1	ABC Inc.	123 Main Street, Vancouver	
2	2	XYZ Corp	456 Elm Avenue, Toronto	
3	3	Tech Solutions Ltd.	789 Oak Lane, Montreal	
4	4	Global Innovations	101 Pine Road, Calgary	
5	5	Acme Industries	222 Cedar Street, Edmonton	

Recruiters Table:

	№ USERNAME	‡	COMPANYID	‡
1	john_doe			1
2	jane_smith			2
3	michael_johnson			3
4	emily_brown			4
5	william_davis			5

JobPosts Table:

	I IODDOCTID .	E DECOUTTEDIN .	C TTTLE	TI LOCATION .	CALARY .	E DOCTRATE .	E IODTVOE .	C DECODINATION .	C DEADLINE .	C NUMOFARRI TOATTONS	E PERMITPENENTS
	N™ JOBLO211D ±	RECRUITERID ÷	□ TITLE ÷	□ LOCATION ÷	□ SALARY =	☐ POSTDATE ÷	N JUBITPE +	□ DESCRIPTION □	N DEADLINE ÷	□ NUMOFAPPLICATIONS ÷	□ KEÑOTKEUEN12
1	1	1 john_doe	Software Engineer	Online	86008	2023-10-18	Full-time	We are looking fo	2023-11-15		Bachelor's degree in Computer Science, Proficie
2		2 jane_smith	Marketing Manager	456 Elm Avenu.	70000	2023-10-19	Full-time	We need an experi	2023-11-20	:	Bachelor's degree in Marketing, 5+ years of mar
3	1	3 michael_johnson	Data Analyst	123 Main Stre	30000	2023-10-19	Internship	We are hiring a d	2023-11-10	:	Strong data analysis skills, familiarity with F
4		4 emily_brown	Graphic Designer	Online	66000	2023-10-21	Full-time	Looking for a cre	2023-11-25	:	Graphic design experience, proficiency in Adobe
5		5 william_davis	Product Manager	101 Pine Road	45000	2023-10-22	Full-time	We are seeking a	2023-11-30		Excellent communication skills, product management
6		6 john_doe	Product Manager	Online	90000	2023-11-05	Full-time	Looking for an ex	2023-12-05	;	5+ years of product management experience, stro
7		7 john_doe	Data Analyst	Online	85000	2023-11-10	Full-time	We are hiring a d	2023-12-10		Ph.D. in Computer Science, experience with mach
8	1	8 william_davis	Data Analyst	101 Pine Road	55000	2023-10-22	Full-time	We are seeking a	2023-11-30		Excellent coding skills
9		9 iane smith	Product Manager	456 Elm Avenu	60000	2023-10-19	Full-time	We need an experi	2023-11-20		Bachelor's degree in Business/STEM, 3+ years of

During:

Any job seeker can log in to view the results. (Eg. username: olivia_wilson password: oliviapassword789)

Department of Computer Science

Find the Company with Recruiters Posting Jobs Exceeding the Overall Average Salary of All Job Posts

Find

After:

Company Id	Company Name	Average Salary		
2	XYZ Corp	65000		
4	Global Innovations	66000		
1	ABC Inc.	85000		

10. Division

Before:

Applications Table:



Resumes Table:



JobPosts Table:

	∏ JOBPOSTID ≎	RECRUITERID :	∏ TITLE ÷	□ LOCATION ÷	□ SALARY ÷	☐ POSTDATE :	□ JOBTYPE ÷	□ DESCRIPTION	U DEADLINE ≎	□ NUMOFAPPLICATIONS =	☐ REQUIREMENTS
1	1	john_doe	Software Engineer	Online	80000	2023-10-18	Full-time	We are looking fo	2023-11-15		4 Bachelor's degree in Computer Science, Proficier
2	2	jane_smith	Marketing Manager	456 Elm Avenu	78008	2023-10-19	Full-time	We need an experi	2023-11-20		1 Bachelor's degree in Marketing, 5+ years of mark
3	3	michael_johnson	Data Analyst	123 Main Stre	38008	2023-10-19	Internship	We are hiring a d	2023-11-10		1 Strong data analysis skills, familiarity with Py
4	4	emily_brown	Graphic Designer	Online	66008	2023-10-21	Full-time	Looking for a cre	2023-11-25		1 Graphic design experience, proficiency in Adobe
5	5	william_davis	Product Manager	101 Pine Road	45000	2023-10-22	Full-time	We are seeking a	2023-11-30		B Excellent communication skills, product manageme
6	6	john_doe	Product Manager	Online	98008	2023-11-05	Full-time	Looking for an ex	2023-12-05		3 5+ years of product management experience, strom
7	7	john_doe	Data Analyst	Online	85000	2023-11-10	Full-time	We are hiring a d	2023-12-10		4 Ph.D. in Computer Science, experience with mach:
8	8	william_davis	Data Analyst	101 Pine Road	55000	2023-10-22	Full-time	We are seeking a	2023-11-30		B Excellent coding skills
9	9	jane_smith	Product Manager	456 Elm Avenu	68008	2023-10-19	Full-time	We need an experi	2023-11-20		B Bachelor's degree in Business/STEM, 3+ years of

JobSeekers Table

Department of Computer Science



During:

The recruiter who logged in (username: john_doe password: johnpassword123):

Hi! john_doe

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