

CIS321 Project Milestone (2): Project of Database Concepts and Design

Group Number: Group 24

Project Title: University Job Hub

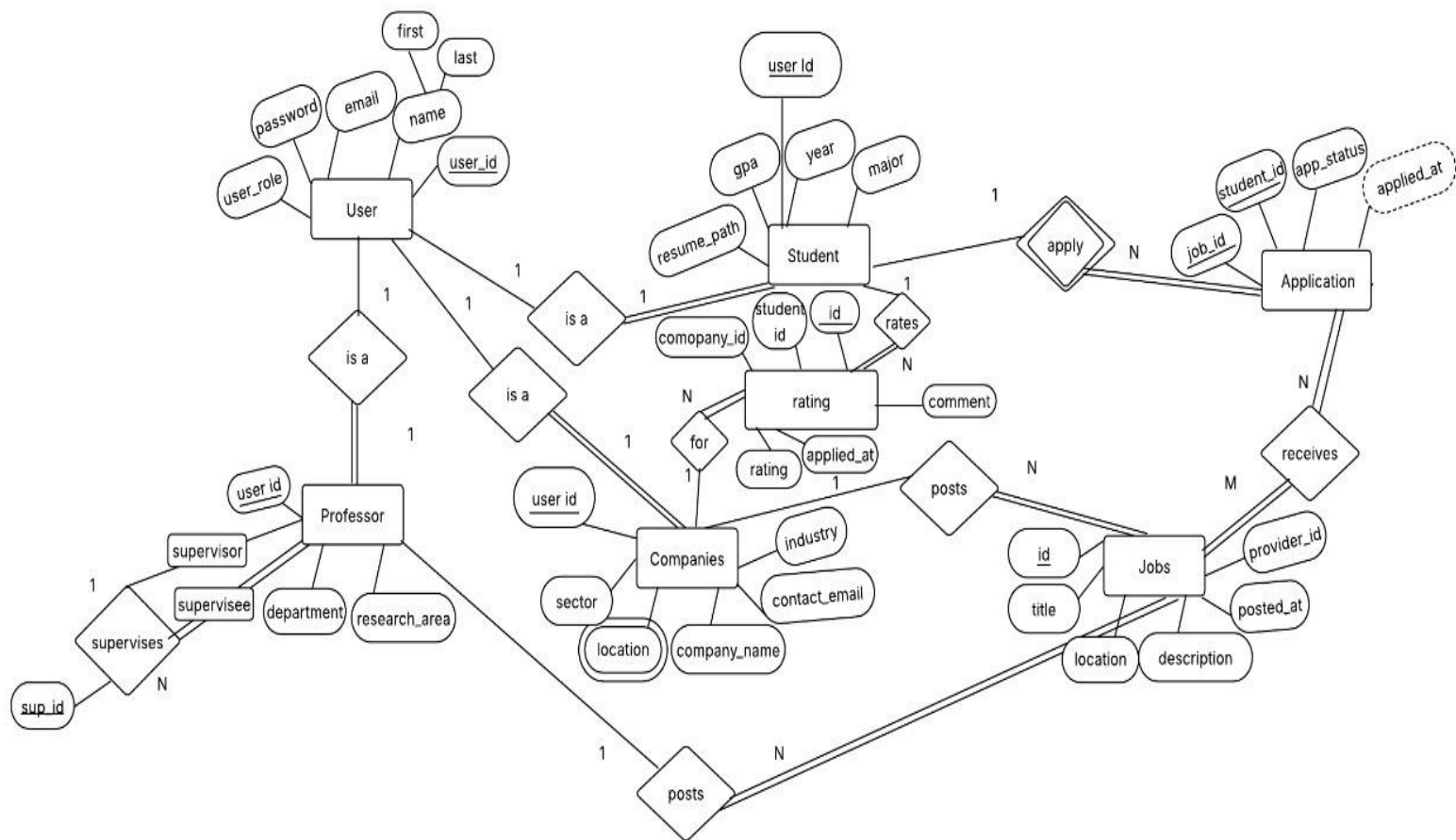
Leader	ID	Member Name
✓	2230006037	Joud Ali Alshehri
<input type="checkbox"/>	2230003532	Abrar Mansour Alharbi
<input type="checkbox"/>	2230003971	Fatimah Ahmed Alibrahim
<input type="checkbox"/>	2230007174	Saeedah Saeed Al-Manhali
<input type="checkbox"/>	2230003110	Rana Saeed Alshath
<input type="checkbox"/>	2230000924	Layan Alharbi
<input type="checkbox"/>	2230003046	Shahad Khalid Alsufyani

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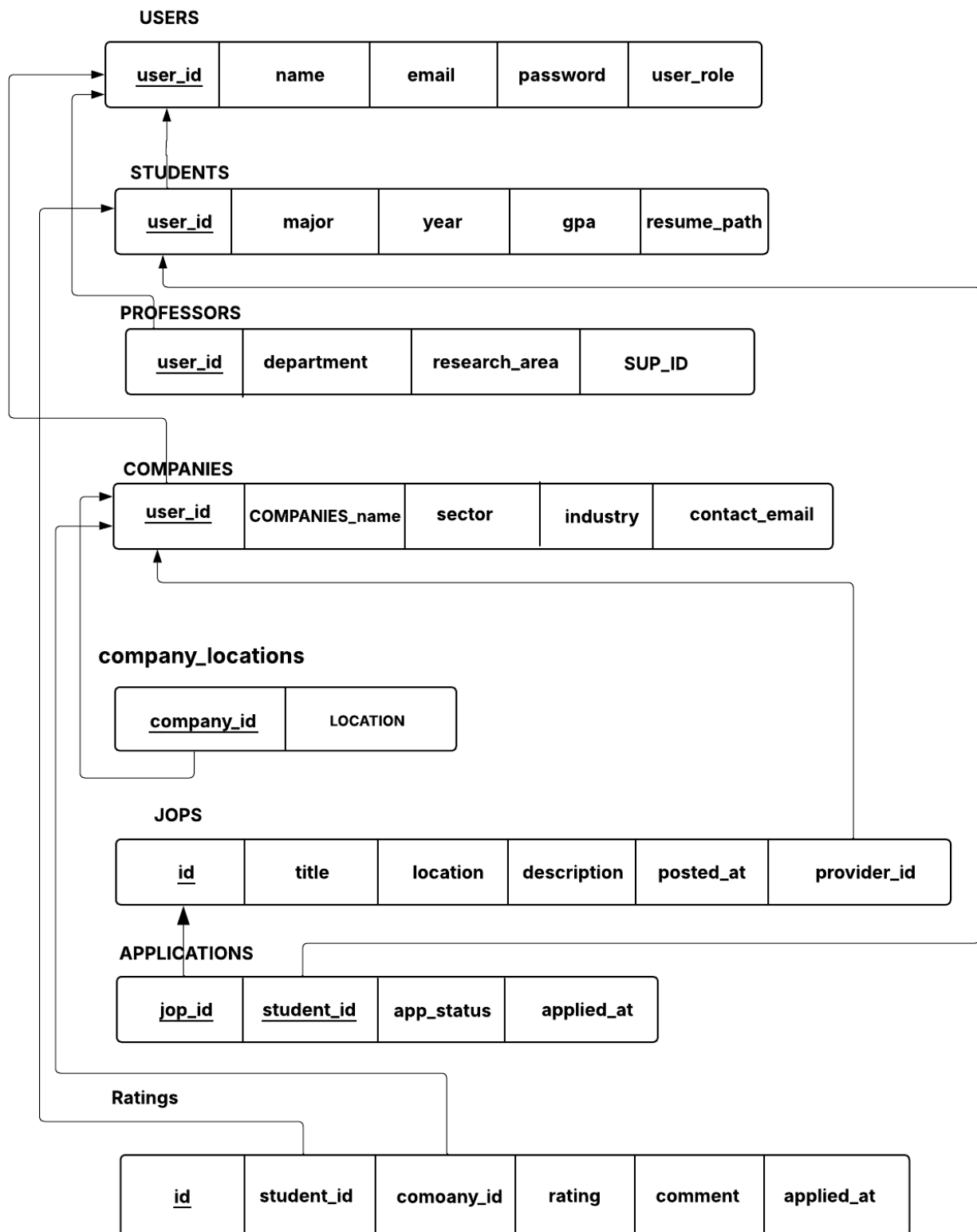
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We add the work of each member of the team as comment on the SQL code

ER Diagram:



MAPPING of your ER diagram into Database Schema:



Tables with full specification of data types for all fields, constraint and Keys:

Table	Attribute	Description	Data Type	Constraint
users	user_id	Unique identifier	int	AUTO_INCREMENT PRIMARY KEY
	Fname	First name	varchar(20)	NOT NULL
	Lname	Last name	varchar(20)	NOT NULL
	email	Email address	varchar(255)	UNIQUE NOT NULL
	password	User's login password	varchar(255)	NOT NULL
	user_role	Role of the user	enum('Student','Company','Admin','Profossor')	NOT NULL
students	user_id	Unique identifier	int	PRIMARY KEY, FOREIGN KEY (users)
	major	Student's academic major	varchar(100)	DEFAULT NULL
	year	Academic year	int	DEFAULT NULL
	gpa	Grade Point Average	int	DEFAULT NULL
	resume_path	Path to uploaded resume	varchar(255)	DEFAULT NULL
companies	user_id	Unique identifier	int	PRIMARY KEY, FOREIGN KEY (users)
	company_name	Name of the company	varchar(255)	NOT NULL
	sector	Industry sector	varchar(100)	DEFAULT NULL
	industry	Type of industry	varchar(100)	DEFAULT NULL
	contact_email	Email address	varchar(255)	DEFAULT NULL
companies	company_id	Company ID	int	FOREIGN KEY (companies.user_i)
	location	Location name	varchar(255)	NOT NULL
jobs	id	Unique identifier	int	AUTO_INCREMENT PRIMARY KEY
	title	Job title	varchar(255)	NOT NULL
	location	Job location	varchar(255)	DEFAULT NULL
	description	Job description	text	DEFAULT NULL
	posted_at	Timestamp of posting	datetime	NOT NULL DEFAULT CURRENT_TIMESTAMP
	provider_id	Job provider	int	FOREIGN KEY (users)
applied	job_id	Job ID	int	PRIMARY KEY (with student_id), FOREIGN KEY (jobs.id)



	student_id	Student ID	int	PRIMARY KEY (with job_id), FOREIGN KEY (students.user_id)
	app_status	Application status	varchar(20)	DEFAULT NULL
	applied_at	Timestamp	datetime	DEFAULT CURRENT_TIMESTAMP
professors	user_id	Professor ID	int	PRIMARY KEY, FOREIGN KEY (users)
	department	Academic department	varchar(100)	DEFAULT NULL
	research_area	Research focus	varchar(255)	DEFAULT NULL
	supervisor_id	Supervisor professor	int	FOREIGN KEY (professors.user_id)
ratings	id	Unique identifier	int	AUTO_INCREMENT PRIMARY KEY
	student_id	Student ID	int	FOREIGN KEY (students.user_id)
	company_id	Company ID	int	FOREIGN KEY (companies.user_id)
	rating	Evaluation score	tinyint UNSIGNED	DEFAULT NULL
	comment	Feedback comment	text	DEFAULT NULL
	applied_at	Timestamp	datetime	DEFAULT CURRENT_TIMESTAMP

Fill Data for all Tables with records:

Table User 1:

user_id	Fname	Lname	email	password	user_role
1	Ahmed	Al-Shehri	ahmed.shehri@student.edu	482c811da5d5b4bc6d497ffa98491e38	Student
2	Lina	Hassan	lina.hassan@student.edu	482c811da5d5b4bc6d497ffa98491e38	Student
3	Yousef	Qahtani	yousef.qahtani@student.edu	482c811da5d5b4bc6d497ffa98491e38	Student
4	Reem	Sudairi	reem.sudairi@student.edu	482c811da5d5b4bc6d497ffa98491e38	Student
5	Omar	Amri	omar.amri@student.edu	482c811da5d5b4bc6d497ffa98491e38	Student
6	Fatima	Al-Fahad	fatima.fahad@student.edu	482c811da5d5b4bc6d497ffa98491e38	Student
9	Hala	Investments	contact@halainvest.com	482c811da5d5b4bc6d497ffa98491e38	Company
10	Tech	Innovators	hr@techninnovators.com	482c811da5d5b4bc6d497ffa98491e38	Company
11	Super	Admin	admin@jobportal.com	698d51a19d8a121ce581499d7b701668	Admin
28	111		111	698d51a19d8a121ce581499d7b701668	Student
30	1111		1111	698d51a19d8a121ce581499d7b701668	Admin
31	11113...		1111133	698d51a19d8a121ce581499d7b701668	Profossor
32	66		66	3295c76acbf4caaed33c36b1b5fc2cb1	Profossor
33	55		55	b53b3a3d6ab90ce0268229151c9bde11	Company
34	EduTech	Arabia	support@edutech.com	dummyhash	Company
35	Green...	Co.	hello@greenpower.com	dummyhash	Company
36	Foodie	Brands	care@foodiebrands.com	dummyhash	Company
37	NextGen	Media	contact@nextgenmedia.com	dummyhash	Company
38	AutoL...		jobs@autologix.com	dummyhash	Company
39	Cyber...	Ltd.	info@cybershield.com	dummyhash	Company
40	Baytak	Real Estate	sales@baytak.com	dummyhash	Company
41	AquaLife	Group	aqualife@group.com	dummyhash	Company
42	Smart...	Arabia	iot@smarthings.sa	dummyhash	Company

users 47 × students 48 companies 49 company_locations 50 jobs 51 applications 52 professors 53

Table Student 2:

user_id	major	year	gpa	resume_path
1	Information Systems	2	4	/resumes/ahmed_shehri.pdf
2	Information Technology	3	4	/resumes/lina_hassan.pdf
3	Mechanical Engineering	4	3	/resumes/yousef_qahtani.pdf
4	Business Administration	1	4	/resumes/reem_sudairi.pdf
5	Computer Science	3	4	/resumes/omar_amri.pdf
6	Finance	2	4	/resumes/fatima_fahad.pdf
28	Computer Science	4	3	/resumes/extra.pdf
70	Software Engineering	1	3	/resumes/student_70.pdf
71	Cybersecurity	2	4	/resumes/student_71.pdf
72	Artificial Intelligence	3	2	/resumes/student_72.pdf
73	Data Science	4	3	/resumes/student_73.pdf
74	Information Technology	1	4	/resumes/student_74.pdf
75	Computer Engineering	2	3	/resumes/student_75.pdf
76	Business Analytics	3	4	/resumes/student_76.pdf
77	Economics	4	2	/resumes/student_77.pdf
78	Digital Media	2	3	/resumes/student_78.pdf
79	Biomedical Informatics	1	4	/resumes/student_79.pdf
NULL	NULL	NULL	NULL	NULL

Table Profosor 3:

user_id	department	research_area	supervisor_id
28	cs	CYS	NULL
32	AI	ML	28
36	CIS	BUS	28
60	Computer Science	AI	NULL
61	Business	Entrepreneurship	60
62	Engineering	Control Systems	60
63	Law	Human Rights	NULL
64	IT	Cybersecurity	NULL
65	Marketing	Digital Ads	NULL
66	Education	E-learning	64
67	Finance	FinTech	64
68	Health	Telemedicine	NULL
69	Media	Mass Communic...	NULL
NULL	NULL	NULL	NULL

Table Company 4:

user_id	company_name	sector	industry	contact_email
9	Hala Investments	Finance	Investment	contact@halainvest.com
10	Tech Innovators	Technology	Software Development	hr@techinnovators.com
31	Gulf Holdings	Energy	Oil & Gas	info@gulfholdings.com
33	Vision Future	Consulting	Business Strategy	future@vision.com
34	EduTech Arabia	Education	E-learning	support@edutech.com
35	GreenPower Co.	Energy	Renewables	hello@greenpower.com
36	Foodie Brands	Retail	Food & Beverage	care@foodiebrands.com
37	NextGen Media	Media	Content Creation	contact@nextgenmedia.com
38	AutoLogix	Transport	Logistics	jobs@autologix.com
39	CyberShield Ltd.	Security	Cybersecurity	info@cybershield.com
40	Baytak Real Estate	Real Estate	Development	sales@baytak.com
41	AquaLife Group	Health	Water Purification	aqualife@group.com
42	SmartThings Arabia	Tech	IoT Solutions	iot@smartthings.sa
43	HealthBridge	Healthcare	Medical Equipment	contact@healthbridge.com
44	DesertSolar Energy	Energy	Solar Power	desert@solarenergy.com
NULL	NULL	NULL	NULL	NULL

Table Application 5:

job_id	student_id	app_status	applied_at
1	1	PENDING	2025-04-17 09:30:00
1	2	PENDING	2025-05-02 18:30:36
2	2	ACCEPTED	2025-04-17 09:45:00
3	3	PENDING	2025-04-17 10:00:00
3	28	ACCEPTED	2025-04-20 02:58:47
4	4	REJECTED	2025-04-17 10:10:00
5	5	PENDING	2025-04-17 10:20:00
5	6	ACCEPTED	2025-04-17 11:30:00
6	6	ACCEPTED	2025-04-17 10:30:00
7	1	PENDING	2025-04-17 10:40:00
7	28	PENDING	2025-04-20 02:53:27
8	2	PENDING	2025-04-17 10:50:00
9	3	REJECTED	2025-04-17 11:00:00
10	4	PENDING	2025-04-17 11:10:00
11	5	PENDING	2025-04-17 11:20:00
NULL	NULL	NULL	NULL

Table Job 6:

id	title	location	description	posted_at	provider_id
1	Full Stack Developer	Riyadh	Develop full stack apps.	2025-04-17 09:00:00	9
2	Data Analyst	Jeddah	Analyze datasets and prepare reports.	2025-04-17 09:15:00	9
3	Project Manager	Dammam	Oversee project lifecycle.	2025-04-17 09:30:00	10
4	UI/UX Designer	Makkah	Design user interfaces and experiences.	2025-04-17 09:45:00	10
5	Financial Controller	Khobar	Manage company finances and budgets.	2025-04-17 10:00:00	9
6	Software Tester	Riyadh	Write and execute test plans.	2025-04-17 10:15:00	9
7	Marketing Spec.	Jeddah	Develop marketing strategies.	2025-04-17 10:30:00	10
8	Network Engineer	Dammam	Maintain network infrastructure.	2025-04-17 10:45:00	9
9	HR Coordinator	Makkah	Coordinate HR activities.	2025-04-17 11:00:00	10
10	AI Research Intern	Abha	Support AI research projects.	2025-04-17 11:15:00	10
11	Full Stack Developer	Riyadh	Develop web apps	2025-04-20 04:27:49	30
NULL	NULL	NULL	NULL	NULL	NULL

Table rating 7:

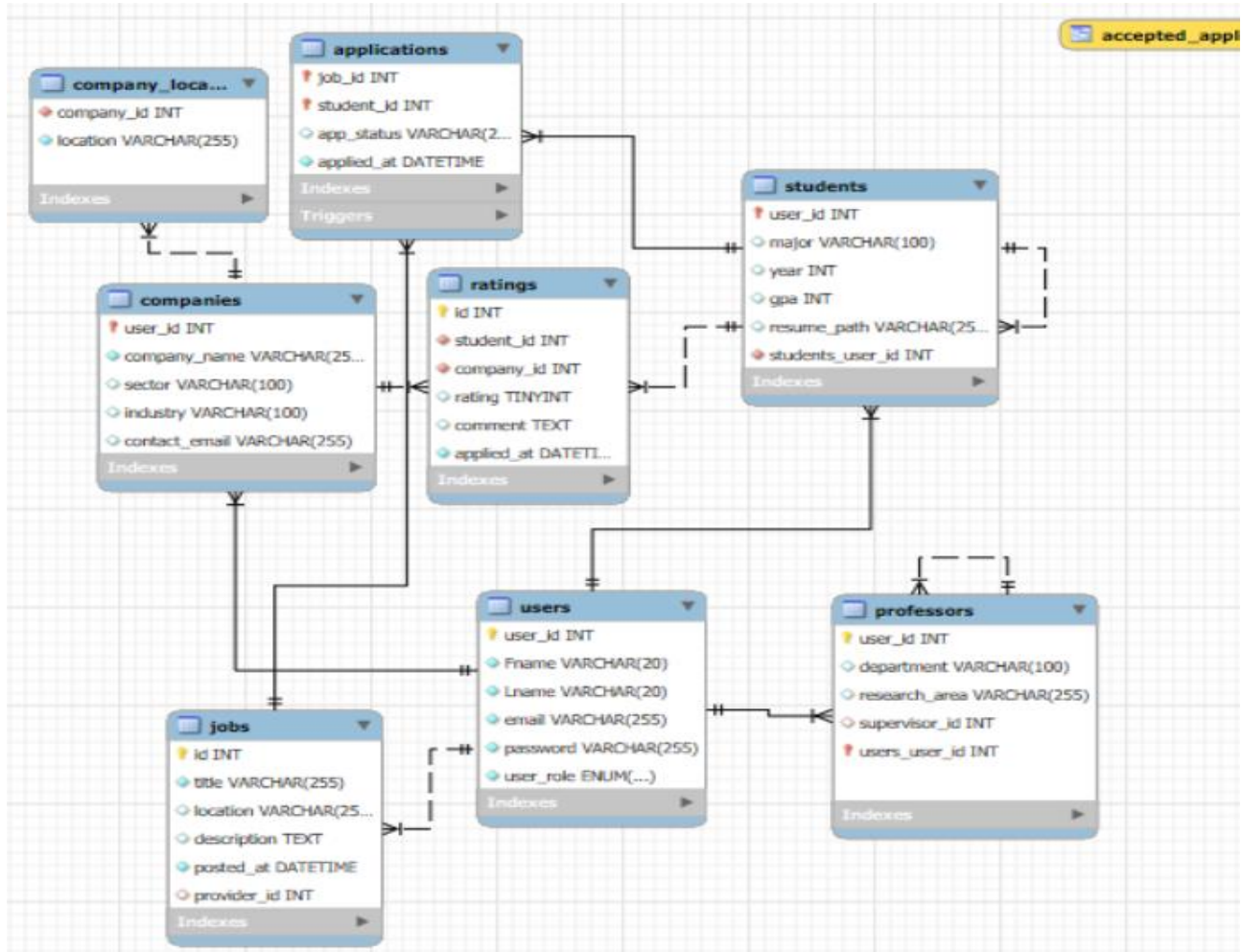
	id	student_id	company_id	rating	comment	applied_at
▶	1	1	9	5	Excellent opportunity and support.	2025-04-17 12:00:00
	2	2	9	4	Good team but long hours.	2025-04-17 12:10:00
	3	3	10	3	Average interview process.	2025-04-17 12:20:00
	4	4	10	5	Great mentoring and feedback.	2025-04-17 12:30:00
	5	5	9	4	Informative and concise.	2025-04-17 12:40:00
	6	6	9	2	Slow communication.	2025-04-17 12:50:00
	7	1	10	5	Loved the culture.	2025-04-17 13:00:00
	8	2	10	4	Challenging but rewarding.	2025-04-17 13:10:00
	9	3	9	3	Needs clearer guidelines.	2025-04-17 13:20:00
	10	4	10	5	Exceptional training provided.	2025-04-17 13:30:00
✱	NULL	NULL	NULL	NULL	NULL	NULL

Table company locations 8:

	company_id	location
▶	9	Riyadh
	10	Jeddah
	10	Khobar
	31	Dammam
	33	Khobar
	33	Riyadh
	34	Riyadh
	34	Jeddah
	35	Jubail
	35	Yanbu
	36	Jeddah
	37	Riyadh
	38	Dammam
	38	Jeddah
	39	Khobar
	40	Jeddah
	40	Makkah
	41	Yanbu
	42	Riyadh
	43	Makkah
	44	AlUla
	44	Tabuk

SQL Query Statements

Database Diagram:



screenshot the result for each query:

-- Update GPA for a specific student who improved

UPDATE students

SET gpa = 4

WHERE user_id = 2;

SELECT user_id, gpa FROM students;

	user_id	gpa
▶	1	4
	2	4
	3	3
	4	4
	5	4
	6	4
	28	3
✱	NULL	NULL

-- Find student emails

```
SELECT user_id, email FROM users
WHERE email LIKE '%@student.edu';
```

	user_id	email
▶	1	ahmed.shehri@student.edu
	6	fatima.fahad@student.edu
	2	lina.hassan@student.edu
	5	omar.amri@student.edu
	4	reem.sudairi@student.edu
	3	yousef.qahtani@student.edu
•	NULL	NULL

-- Students with GPA between 3 and 4

```
SELECT students.user_id, CONCAT(users.Fname, ' ',
users.Lname) AS name, students.gpa
FROM users
JOIN students ON users.user_id = students.user_id
WHERE students.gpa BETWEEN 3 AND 4;
```

	user_id	name	gpa
▶	1	Ahmed Al-Shehri	4
	2	Lina Hassan	4
	3	Yousef Qahtani	3
	4	Reem Sudairi	4
	5	Omar Amri	4
	6	Fatima Al-Fahad	4
	28	111	3

-- Get job titles for certain job IDs

```
SELECT id, title FROM jobs
WHERE id IN (1, 3, 5);
```

	id	title
▶	1	Full Stack Developer
	3	Project Manager
	5	Financial Controller
•	NULL	NULL

-- Company ratings from highest to lowest

```
SELECT id, company_id, rating FROM ratings
ORDER BY rating DESC;
```

	id	company_id	rating
▶	1	9	5
	4	10	5
	7	10	5
	10	10	5
	2	9	4
	5	9	4
	8	10	4
	3	10	3
	9	9	3
	6	9	2
•	NULL	NULL	NULL

-- Companies missing contact email

SELECT user_id, company_name FROM companies

WHERE contact_email IS NULL;

	user_id	company_name
•	NULL	NULL

-- All IDs for students and professors

SELECT user_id, 'Student' AS role FROM students

UNION

SELECT user_id, 'Professor' AS role FROM professors;

	user_id	role
▶	1	Student
	2	Student
	3	Student
	4	Student
	5	Student
	6	Student
	28	Student
	28	Professor
	60	Professor
	63	Professor
	64	Professor
	65	Professor
	68	Professor
	69	Professor
	32	Professor
	36	Professor
	61	Professor
	62	Professor
	66	Professor
	67	Professor

-- Students who also exist in users table

SELECT user_id, major FROM students

WHERE user_id IN (SELECT user_id FROM users);

	user_id	major
▶	1	Information Systems
	2	Information Technology
	3	Mechanical Engineering
	4	Business Administration
	5	Computer Science
	6	Finance
	28	Computer Science
•	NULL	NULL

-- Students who did not apply for any job

SELECT user_id, major FROM students

WHERE user_id NOT IN (SELECT student_id FROM applications);

	user_id	major
•	NULL	NULL

-- Majors with more than one student

SELECT major, COUNT(*) AS student_count

FROM students

GROUP BY major

HAVING COUNT(*) > 1;

	major	student_count
▶	Computer Science	2

-- Application info with job title

```
SELECT applications.job_id, applications.student_id, jobs.title
FROM applications
JOIN jobs ON applications.job_id = jobs.id;
```

job_id	student_id	title
1	1	Full Stack Developer
1	2	Full Stack Developer
2	2	Data Analyst
3	3	Project Manager
3	28	Project Manager
4	4	UI/UX Designer
5	5	Financial Controller
5	6	Financial Controller
6	6	Software Tester
7	1	Marketing Spec.
7	28	Marketing Spec.
8	2	Network Engineer
9	3	HR Coordinator
10	4	AI Research Intern
11	5	Full Stack Developer

-- Students and their applied jobs (if any)

```
SELECT s.user_id, CONCAT(u.Fname, ' ', u.Lname) AS name, a.job_id
FROM students s
JOIN users u ON s.user_id = u.user_id
LEFT JOIN applications a ON s.user_id = a.student_id;
```

user_id	name	job_id
1	Ahmed Al-Shehri	1
1	Ahmed Al-Shehri	7
2	Lina Hassan	1
2	Lina Hassan	2
2	Lina Hassan	8
3	Yousef Qahtani	3
3	Yousef Qahtani	9
4	Reem Sudairi	4
4	Reem Sudairi	10
5	Omar Amri	5
5	Omar Amri	11
6	Fatima Al-Fahad	5
6	Fatima Al-Fahad	6
28	111	3
28	111	7

-- Show all students if there's one with GPA ≠ 4

```
SELECT user_id, gpa FROM students
WHERE EXISTS (
    SELECT user_id, gpa FROM students WHERE gpa <> 4
);
```

user_id	gpa
1	4
2	4
3	3
4	4
5	4
6	4
28	3
NULL	NULL

-- Students who applied to 'Full Stack Developer'

```
SELECT s.user_id, CONCAT(u.Fname, ' ', u.Lname) AS name FROM
students s
JOIN users u ON s.user_id = u.user_id WHERE s.user_id IN (
    SELECT student_id FROM applications WHERE job_id IN (
        SELECT id FROM jobs WHERE title = 'Full Stack Developer' ));
```

user_id	name
1	Ahmed Al-Shehri
2	Lina Hassan
5	Omar Amri

-- Return GPA for student ID

DELIMITER //

CREATE FUNCTION get_student_gpa(s_id INT)

RETURNS INT

DETERMINISTIC

BEGIN

DECLARE gpa_val INT;

SELECT gpa INTO gpa_val FROM students WHERE user_id = s_id;

RETURN gpa_val;

END;

//

DELIMITER ;

SELECT get_student_gpa(1);

	get_student_gpa(1)
▶	4

-- Procedure to return accepted applications

DELIMITER //

CREATE PROCEDURE GetAcceptedApplications()

BEGIN

SELECT job_id, student_id FROM applications WHERE app_status = 'ACCEPTED';

END;

//

DELIMITER ;

CALL GetAcceptedApplications();

	job_id	student_id
▶	2	2
	3	28
	5	6
	6	6

-- Capitalize status before insert

DELIMITER //

CREATE TRIGGER before_insert_application

BEFORE INSERT ON applications

FOR EACH ROW

BEGIN

SET NEW.app_status = UPPER(NEW.app_status);

END;

//

DELIMITER ;

INSERT INTO applications (job_id, student_id, app_status)

VALUES (1, 2, 'pending');

SELECT job_id, student_id, app_status FROM applications;

	job_id	student_id	app_status
▶	1	1	PENDING
	1	2	PENDING
	2	2	ACCEPTED
	3	3	PENDING
	3	28	ACCEPTED
	4	4	REJECTED
	5	5	PENDING
	5	6	ACCEPTED
	6	6	ACCEPTED
	7	1	PENDING
	7	28	PENDING
	8	2	PENDING
	9	3	REJECTED
	10	4	PENDING
	11	5	PENDING
•	NULL	NULL	NULL

-- View accepted apps with student name & job title

CREATE OR REPLACE VIEW accepted_applications_view AS

SELECT a.job_id AS application_id, a.student_id,

CONCAT(u.Fname, ' ', u.Lname) AS student_name, j.title AS
job_title

FROM applications a

JOIN students s ON a.student_id = s.user_id

JOIN users u ON s.user_id = u.user_id

JOIN jobs j ON a.job_id = j.id

WHERE a.app_status = 'ACCEPTED';

SELECT application_id, student_name, job_title FROM accepted_applications_view;

	application_id	student_name	job_title
▶	2	Lina Hassan	Data Analyst
	3	111	Project Manager
	5	Fatima Al-Fahad	Financial Controller
	6	Fatima Al-Fahad	Software Tester