T.C.
YILDIZ TEKNİK ÜNİVERSİTESİ

BİLGİSAYAR MÜHENDİSLİĞİ

VERİTABANI YÖNETİMİ İŞBUL UYGULAMASI

SONUÇ RAPORU

**Proje Çalışanları:**
Emir Kerem Öztürk
Ahmed Resul Kurt

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İSTANBUL

Proje Özeti:

- Bizim projemiz olan "İşBul – İş Başvuru Sistemi" konusu üzerine bir veri tabanı ve arayüzü oluşturduk. Kodumuzu C# dilinde scriptler ile yazdık ama tabii ki de dersin gerektirdiği şekilde sorgular uzun uzun yazıldı. İçinde 10 kayıt olan 4 tane tablo oluşturuldu, sayı ve silme kısıtları belirlendi ardından web sitesinde işlemler gerçekleşmesi için istenilen sorgular yazıldı ve kod arasında bağlantı sağlandı. Aynı zamanda istenilen Functionlar ve Triggerlar yazıldı içlerinde bulunması gereken özellikler ile birlikte (record, cursor, vb)

- ASP.NET Core MVC uygulaması ile dinamik web sayfası (arayüz) tasarlandı ve çalıştırıldı. Entity Framework tablolar oluşturulurken, tablo ile classler arasında mapping işlemler, db(veri tabanı) bağlantısı oluşturmayı, sorguları veri tabanına gönderme ve veri okuma işlemini yapar.

- Web sitesi için ayrıca html kod yazıldı. DbContext: c#, sql yazmak için kolaylıklar sağlar. Veri tabanı ve kod arasındaki bağlantıyı sağlar.

Koddan çıkan Entity ilişki diyagramı: (Crows foot notation)
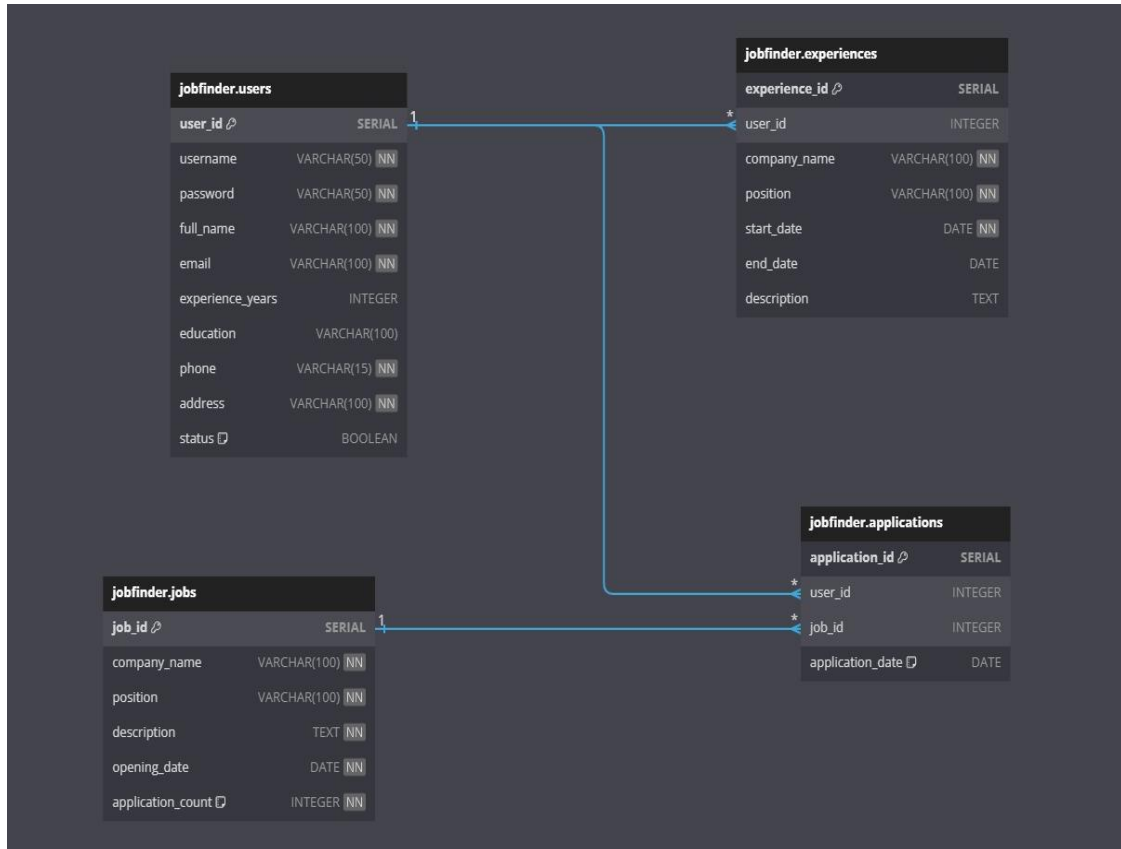
Bizim çizdiğimiz Entity-Relation diyagramı: (Chen notation)
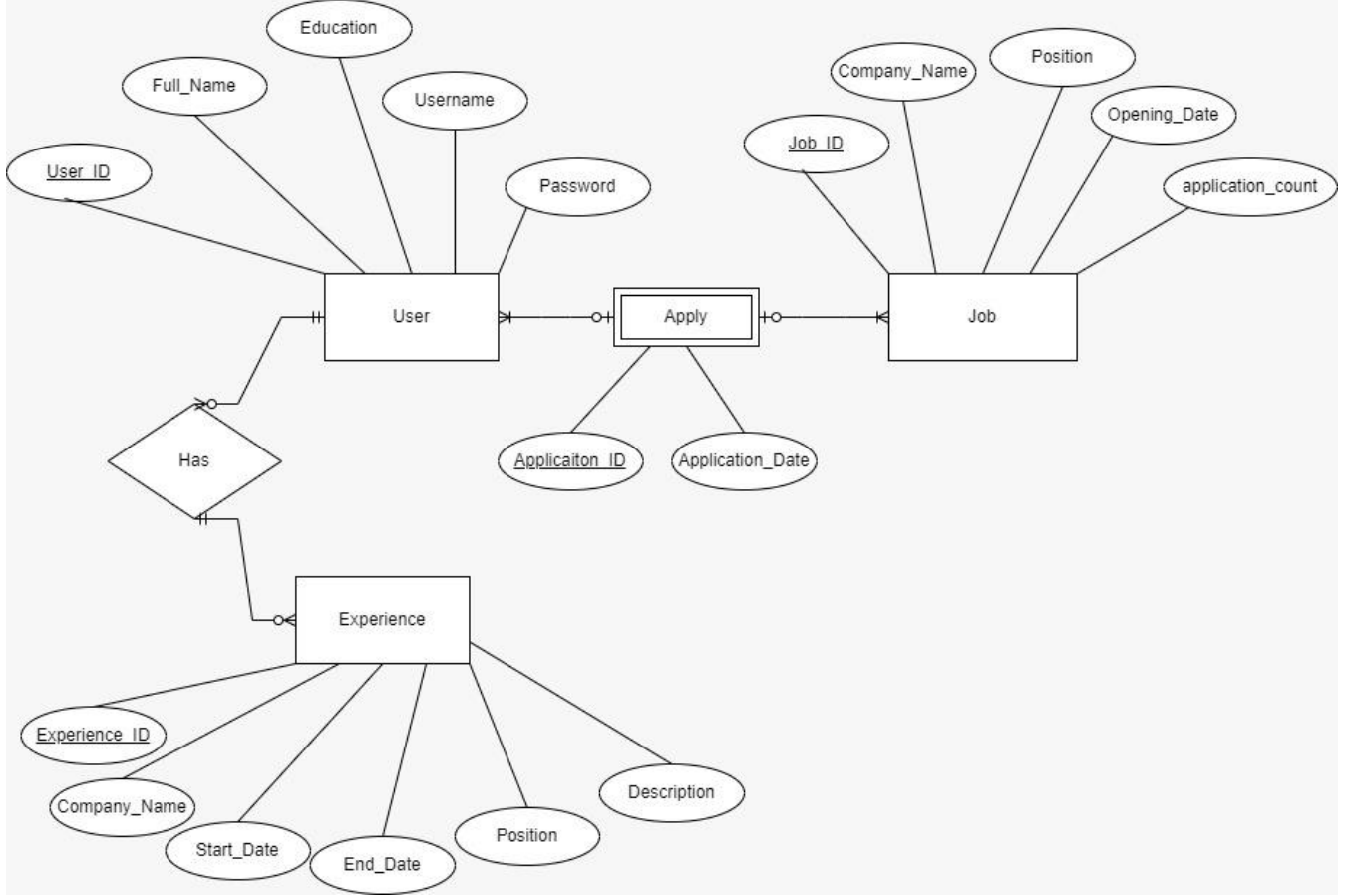
Veri tabanındaki tablolar:

```
1  SELECT * FROM jobfinder.jobs;
```

Data Output   Messages   Notifications   Scratch Pad ×

	job_id [PK] integer	company_name character varying	position character varying	description text	opening_date date	application_count integer
1	7	Unity	Network Engineer	Designing and implementing network solutions for clients	2023-07-22	0
2	8	Data Insights	Business IT Analyst	Extracting and analyzing data to provide actions	2023-08-01	0
3	10	Innovative Systems	Team Leader	Leading the team of engineers to create innovative UI	2023-10-01	0
4	1	Google	Software Engineer	Developing software solutions	2023-01-16	2
5	2	Migros	Data Scientist	Analyzing complex data sets	2023-02-08	2
6	4	Getir	Senior Data Analyst	Analyzing and visualizing data for businesses	2023-04-30	2
7	5	Sony	UX/UI Designer	Designing user-friendly interfaces	2023-05-12	2
8	6	Creative Minds	AI Learning Engineer	Implementing algorithms for AI to improve its predictive analy…	2023-06-01	1
9	9	Erikli Code	Full Stack Developer	Developing web applications with more recent technologies	2023-09-01	1
10	3	UTS	Web Developer	Creating dynamic web applications	2023-03-01	3

```sql
1  SELECT * FROM jobfinder.experiences;
```

Data Output | Messages | Notifications | Scratch Pad ×

	experience_id [PK] integer	user_id integer	company_name character varying	position character varying	start_date date	end_date date	description text
1	1	1	YTU	Assistant	2021-01-01	2022-01-01	Assisted the students well
2	2	2	Maxima	Data Analyst	2021-02-01	2023-02-28	Created complex data sets
3	3	3	Looksmaxx	UX/UI Intern	2019-06-01	2020-01-01	Assisted the team in designing user interfaces
4	4	4	Code Wizards	Full Stack Developer	2022-03-01	[null]	Developed smooth web applications
5	5	5	Data Insights	Business Analyst	2021-08-01	2022-08-01	Extracted and analyzed data for businesses
6	6	6	Entertain Games	Network Engineer	2020-12-01	2021-12-01	Designed and implemented network solutions for multiplayer gam...
7	7	7	Creative Minds	UX/UI Designer	2018-10-01	2019-05-01	Designed visually appealing interfaces
8	8	8	Innovative Systems	DevOps Engineer	2022-04-01	[null]	Automated and optimized the software development lifecycle
9	9	9	Trash Collection	Leader Collector	2019-03-01	2021-03-01	Kept the streets very clean
10	10	10	Seniukai	Data Scientist	2022-06-01	[null]	Analyzed and interpreted data sets
11	11	1	Deneme	Tester	2020-01-01	2021-01-01	a

```sql
1  SELECT * FROM jobfinder.users;
```

Data Output | Messages | Notifications | Scratch Pad ×

	user_id [PK] integer	username character varying	password character varying	full_name character varying	email character varying	experience_years integer	education character varying	phone character varying	address character varying	status boolean
1	1	ozturk	123	Kerem Öztürk	ciaoemirkerem@gmail.com	1	Computer Engineering	5342360126	123 Barajyolu Cd.	true
2	2	doe	456	John Doe	johnd@gmail.com	3	Software Engineering	9876543210	456 Oak St	true
3	3	pitt	789	Brad Pitt	bradp3@gmail.com	2	Business Administration	5551112233	789 Pine St	true
4	4	jolie	000	Angelina Jolie	angel@gmail.com	7	Electrical Engineering	9998887766	101 Maple St	true
5	5	portman	159	Natalie Portman	portman@gmail.com	4	Information Technology	1110009999	202 Cedar St	true
6	6	sakai	1244	Jin Sakai	sakai99@gmail.com	6	Mechanical Engineering	4443332222	303 Birch St	true
7	7	jordan	852	Michael Jordan	mj@gmail.com	10	Software Engineering	7776665555	404 Oak St	true
8	8	james	963	Lebron James	lebron66@gmail.com	8	Computer Science	2223334444	505 Pine St	true
9	9	turan	asd	Arda Turan	ardat@gmail.com	12	Water Seller	6667778888	606 Maple St	true
10	10	tunali	qwe	Esra Tunali	esrat@gmail.com	3	Mechanical Engineering	3334445555	707 Birch St	true

```sql
1  SELECT * FROM jobfinder.applications;
```

Data Output | Messages | Notifications | Scratch Pad ×

	application_id [PK] integer	user_id integer	job_id integer	application_date date
1	1	1	1	2023-01-05
2	2	2	1	2023-01-06
3	3	3	2	2023-02-08
4	4	4	2	2023-02-10
5	5	5	3	2023-03-15
6	6	6	3	2023-03-18
7	7	7	4	2023-04-22
8	8	8	4	2023-04-25
9	9	9	5	2023-05-30
10	10	10	5	2023-06-01
11	11	1	6	2024-01-11
12	12	1	9	2024-01-11
13	15	1	3	2024-01-12

İstenilenler:
       İçinde 10 kayıt olan 4 tablo

```
CREATE TABLE jobfinder.users (
    user_id SERIAL PRIMARY KEY,
    username VARCHAR(50) UNIQUE NOT NULL,
    password VARCHAR(50) NOT NULL,
    full_name VARCHAR(100) NOT NULL,
    email VARCHAR(100) NOT NULL,
    experience_years INTEGER,
    education VARCHAR(100),
    phone VARCHAR(15) NOT NULL,
    address VARCHAR(100) NOT NULL,
    status BOOLEAN DEFAULT TRUE
);

CREATE TABLE jobfinder.jobs (
    job_id SERIAL PRIMARY KEY,
    company_name VARCHAR(100) NOT NULL,
    position VARCHAR(100) NOT NULL,
    description TEXT NOT NULL,
    opening_date DATE NOT NULL,
    application_count INTEGER CHECK (application_count >= 0) DEFAULT 0 NOT NULL
);

CREATE TABLE jobfinder.applications (
    application_id SERIAL PRIMARY KEY,
    user_id INTEGER REFERENCES jobfinder.users(user_id) ON DELETE RESTRICT,
    job_id INTEGER REFERENCES jobfinder.jobs(job_id) ON DELETE CASCADE,
    application_date DATE DEFAULT CURRENT_DATE
);

CREATE TABLE jobfinder.experiences (
    experience_id SERIAL PRIMARY KEY,
    user_id INTEGER REFERENCES jobfinder.users(user_id) ON DELETE CASCADE,
    company_name VARCHAR(100) NOT NULL,
    position VARCHAR(100) NOT NULL,
    start_date DATE NOT NULL,
    end_date DATE,
    description TEXT
);


INSERT INTO jobfinder.users (username, password, full_name, email, experience_years,
education, phone, address)
VALUES
    ('ozturk', '123', 'Kerem Öztürk', 'ciaoemirkerem@gmail.com', 1, 'Computer Engineering',
'5342360126', '123 Barajyolu Cd.'),
    ('doe', '456', 'John Doe', 'johnd@gmail.com', 3, 'Software Engineering', '9876543210', '456
Oak St'),
```

('pitt', '789', 'Brad Pitt', 'bradp3@gmail.com', 2, 'Business Administration', '5551112233', '789 Pine St'),
('jolie', '000', 'Angelina Jolie', 'angel@gmail.com', 7, 'Electrical Engineering', '9998887766', '101 Maple St'),
('portman', '159', 'Natalie Portman', 'portman@gmail.com', 4, 'Information Technology', '1110009999', '202 Cedar St'),
('sakai', '1244', 'Jin Sakai', 'sakai99@gmail.com', 6, 'Mechanical Engineering', '4443332222', '303 Birch St'),
('jordan', '852', 'Michael Jordan', 'mj@gmail.com', 10, 'Software Engineering', '7776665555', '404 Oak St'),
('james', '963', 'Lebron James', 'lebron66@gmail.com', 8, 'Computer Science', '2223334444', '505 Pine St'),
('turan', 'asd', 'Arda Turan', 'ardat@gmail.com', 12, 'Water Seller', '6667778888', '606 Maple St'),
('tunali', 'qwe', 'Esra Tunali', 'esrat@gmail.com', 3, 'Mechanical Engineering', '3334445555', '707 Birch St');

INSERT INTO jobfinder.jobs (company_name, position, description, opening_date)
VALUES
('Google', 'Software Engineer', 'Developing software solutions', '2023-01-16'),
('Migros', 'Data Scientist', 'Analyzing complex data sets', '2023-02-08'),
('UTS', 'Web Developer', 'Creating dynamic web applications', '2023-03-01'),
('Getir', 'Senior Data Analyst', 'Analyzing and visualizing data for businesses', '2023-04-30'),
('Sony', 'UX/UI Designer', 'Designing user-friendly interfaces', '2023-05-12'),
('Creative Minds', 'AI Learning Engineer', 'Implementing algorithms for AI to improve its predictive analysis', '2023-06-01'),
('Unity', 'Network Engineer', 'Designing and implementing network solutions for clients', '2023-07-22'),
('Data Insights', 'Business IT Analyst', 'Extracting and analyzing data to provide actions', '2023-08-01'),
('Erikli Code', 'Full Stack Developer', 'Developing web applications with more recent technologies', '2023-09-01'),
('Innovative Systems', 'Team Leader', 'Leading the team of engineers to create innovative UI', '2023-10-01');

INSERT INTO jobfinder.applications (user_id, job_id, application_date)
VALUES
(1, 1, '2023-01-05'),
(2, 1, '2023-01-06'),
(3, 2, '2023-02-08'),
(4, 2, '2023-02-10'),
(5, 3, '2023-03-15'),
(6, 3, '2023-03-18'),
(7, 4, '2023-04-22'),
(8, 4, '2023-04-25'),
(9, 5, '2023-05-30'),
(10, 5, '2023-06-01');

INSERT INTO jobfinder.experiences (user_id, company_name, position, start_date, end_date, description)

VALUES
   (1, 'YTU', 'Assistant', '2021-01-01', '2022-01-01', 'Assisted the students well'),
   (2, 'Maxima', 'Data Analyst', '2021-02-01', '2023-02-28', 'Created complex data sets'),
   (3, 'Looksmaxx', 'UX/UI Intern', '2019-06-01', '2020-01-01', 'Assisted the team in designing user interfaces'),
   (4, 'Code Wizards', 'Full Stack Developer', '2022-03-01', NULL, 'Developed smooth web applications'),
   (5, 'Data Insights', 'Business Analyst', '2021-08-01', '2022-08-01', 'Extracted and analyzed data for businesses'),
   (6, 'Entertain Games', 'Network Engineer', '2020-12-01', '2021-12-01', 'Designed and implemented network solutions for multiplayer games'),
   (7, 'Creative Minds', 'UX/UI Designer', '2018-10-01', '2019-05-01', 'Designed visually appealing interfaces'),
   (8, 'Innovative Systems', 'DevOps Engineer', '2022-04-01', NULL, 'Automated and optimized the software development lifecycle'),
   (9, 'Trash Collection', 'Leader Collector', '2019-03-01', '2021-03-01', 'Kept the streets very clean'),
   (10, 'Seniukai', 'Data Scientist', '2022-06-01', NULL, 'Analyzed and interpreted data sets');

primary key – foreign key - constraints

user_id SERIAL PRIMARY KEY
 job_id SERIAL PRIMARY KEY
application_id SERIAL PRIMARY KEY
experience_id SERIAL PRIMARY KEY

user_id INTEGER REFERENCES jobfinder.users(user_id) ON DELETE RESTRICT
job_id INTEGER REFERENCES jobfinder.jobs(job_id) ON DELETE CASCADE
user_id INTEGER REFERENCES jobfinder.users(user_id) ON DELETE CASCADE
application_count INTEGER CHECK (application_count >= 0) DEFAULT 0 NOT NULL

Insert, Update, Delete

1)Insert into jobfinder.application(user_id,job_id,application_date) values({0},{1},{2})
2)Update jobfinder.experiences set user_id = {1}, company_name = {2},position = {3},start_date = {4},end_date = {5},description = {6} Where experience_id = {0}
3) Delete from jobfinder.applications Where application_id = {0}

Arayüz girilecek değere göre ekrana sonuç veren sorgu

SELECT * FROM jobfinder.search_jobs({0})

View sorgusu

```sql
CREATE OR REPLACE VIEW jobfinder.active_users
 AS
 SELECT user_id,
    username,
    password,
    full_name,
    email,
    experience_years,
    education,
    phone,
    address,
    status
   FROM jobfinder.users
  WHERE status = true;
```

Sequence

user_id SERIAL PRIMARY KEY
job_id SERIAL PRIMARY KEY
application_id SERIAL PRIMARY KEY
experience_id SERIAL PRIMARY KEY

> ∨ 1..3 Sequences (4)
>
> 1..3 applications_application_id_seq
>
> 1..3 experiences_experience_id_seq
>
> 1..3 jobs_job_id_seq
>
> 1..3 users_user_id_seq

Union kullanımı (Fonksiyon içerisinde)

```sql
CREATE OR REPLACE FUNCTION jobfinder.contact_companies(userid int)
RETURNS TABLE (
    Company_Name VARCHAR
) AS $$
BEGIN
    RETURN QUERY
SELECT
    j.company_name
FROM
    jobfinder.applications app inner join jobfinder.jobs j on j.job_id = app.job_id
        WHERE app.user_id = userid
UNION
SELECT
    e.company_name
FROM
    jobfinder.experiences e
        WHERE e.user_id = userid;
END;
$$ LANGUAGE plpgsql;
```

Aggregate fonksiyonu

```sql
SELECT COUNT(a.application_id)
FROM jobfinder.users u JOIN jobfinder.applications a ON u.user_id = a.user_id
WHERE u.user_id = @id
GROUP BY u.user_id HAVING COUNT(a.application_id) >= 1
```

Istenilen 3 fonksiyon

1)
```
CREATE OR REPLACE FUNCTION jobfinder.search_jobs(searchTerm VARCHAR)
RETURNS TABLE (
    Job_Id integer,
    Company_Name VARCHAR,
    "Position" VARCHAR,
    Description TEXT,
    Opening_Date DATE,
    Application_Count INT
) AS $$
BEGIN
    RETURN QUERY
    SELECT  jobs.Job_Id,  jobs.Company_Name,  jobs.Position,  jobs.Description,  jobs.Opening_Date,
jobs.Application_Count
    FROM jobfinder.jobs
    WHERE jobs.Company_Name LIKE ('%' || searchTerm || '%')
      OR jobs.Position LIKE ('%' || searchTerm || '%')
      OR jobs.Description LIKE ('%' || searchTerm || '%');
END;
$$ LANGUAGE plpgsql;
```

2)
```
CREATE  OR  REPLACE  FUNCTION  jobfinder.get_user_applications(user_id_param  INTEGER,
OUT application_id INTEGER, OUT job_id INTEGER, OUT application_date DATE)
RETURNS SETOF RECORD AS $$
DECLARE
    user_applications CURSOR FOR
        SELECT ap.application_id, ap.job_id, ap.application_date
        FROM jobfinder.applications ap
        WHERE user_id = user_id_param;
BEGIN
    OPEN user_applications;
    LOOP
        FETCH user_applications INTO application_id, job_id, application_date;
        EXIT WHEN NOT FOUND;
        RETURN NEXT;
    END LOOP;
    CLOSE user_applications;
    RETURN;
END;
$$ LANGUAGE plpgsql;
```

3)
```
CREATE OR REPLACE FUNCTION jobfinder.contact_companies(userid int)
RETURNS TABLE (
    Company_Name VARCHAR
) AS $$
BEGIN
    RETURN QUERY
SELECT
    j.company_name
FROM
```

```
      jobfinder.applications app inner join jobfinder.jobs j on j.job_id = app.job_id
            WHERE app.user_id = userid
UNION
SELECT
    e.company_name
FROM
    jobfinder.experiences e
            WHERE e.user_id = userid;
END;
$$ LANGUAGE plpgsql;
```

Istenilen 2 Trigger

1)
```
CREATE OR REPLACE FUNCTION jobfinder.update_application_count()
RETURNS TRIGGER AS $$
BEGIN
    UPDATE jobfinder.jobs
    SET application_count = application_count + 1
    WHERE job_id = NEW.job_id;
    RETURN NEW;
END;
$$ LANGUAGE plpgsql;

CREATE TRIGGER update_application_count_trigger
AFTER INSERT ON jobfinder.applications
FOR EACH ROW
EXECUTE FUNCTION jobfinder.update_application_count();
```

2)
```
CREATE OR REPLACE FUNCTION jobfinder.check_application_count()
RETURNS TRIGGER AS $$
BEGIN
    IF (SELECT COUNT(*) FROM jobfinder.applications WHERE job_id = NEW.job_id AND
user_id = NEW.user_id) >= 1 THEN
        RAISE EXCEPTION 'Bir kullanıcı aynı ilana birden fazla başvuruda bulunamaz.';
    END IF;
    RETURN NEW;
END;
$$ LANGUAGE plpgsql;

CREATE TRIGGER application_count_trigger
BEFORE INSERT ON jobfinder.applications
FOR EACH ROW
EXECUTE FUNCTION jobfinder.check_application_count();
```