CPSC 2221 - Database Systems

Group Project - Implementation of a Relational Database

Project Title: Talent Connect

Project Milestone: Milestone 3

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By keying our names and student IDs in the above table, we certify that the work submitted with this cover page was performed solely by those whose names and student IDs are included above.

Also, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Langara College.

Functional Dependency

Users{

uid → fname, lname, email, phone_number, password, age, photo, resume, created_at, gender, role

email → uid

}

Work_Experience {

(user_id, weid) → company_name, job_title, start_date, end_date, description, location

}

Education {

(user_id, eid) → school_name, degree, start_date, end_date, field_of_study

}

Skills {

sid → user_id, skill_name, languages

}

Companies {

cid → company_name, email, password, description, industry, hq_city, owner_name, owner_email, banner, logo, created_at, parent_cid

email → cid

}

Company_Employees {

ceid → employee_uid, employee_cid, role_title, can_post

(employee_uid, employee_cid) → ceid, role_title, can_post

}

Jobs {

jid → cid, title, description, location, employment_type, experience_level, min_salary, max_salary, qualifications, created_at, visibility

}

Job_Applications{

(uid, jid) → status, applied_at

jaid → uid, jid, status, applied_at

}

Normalization:

1)User

- **FDs**: `uid → (first_name, last_name, email, phone, password_hash, age, photo_url, resume_url, created_at, gender, role)`
- email → uid
- **Key**: `uid`
- **NF**: BCNF (only key → non-keys)

2)Work Expericence

- **FDs**: `(uid, weid) → (company_name, job_title, start_date, end_date, description, location)`
- **Key**: `(uid, weid)`
- **NF**: BCNF (composite key → non-keys)

3)Education

- **FDs**: (uid, edid) → (school_name, degree, start_date, end_date, field_of_study)
- **Key**: (uid, edid)
- **NF**: BCNF

4)Skills

- **FDs**: (uid, sid) → skill_name, language
- **Key**: (uid, sid)
- **NF**: BCNF

5)Company

- **FDs**: cid → (company_name, email, password_hash, description, industry, hq_city, owner_name, owner_email, banner_url, logo_url, created_at)
- **Key**: cid
- **NF**: BCNF

6)Company_Employees

- **FDs**: ceid → (uid, cid) and (uid, cid) → ceid (one-to-one)
- **Keys**: ceid and also (uid, cid) is a candidate key
- **NF**: BCNF

7)Jobs

- **FDs**: jid → (cid, title, description, location, employment_type, experience_level, min_salary, max_salary, qualifications, created_at, visibility)
- **Key**: jid
- **NF**: BCNF

8)Job_Application

- **FDs**: (uid, jid) → (status, applied_at)
- **Keys**: jaid Candidate key also (uid, jid).
- **NF**: BCNF if all non-keys depend on the key and there are no transitive dependencies.

SQL/DDL

```
CREATE TABLE Users (
  uid INT(11) AUTO_INCREMENT PRIMARY KEY,
  fname VARCHAR(50) NOT NULL,
  lname VARCHAR(50) NOT NULL,
  age INT(11) NOT NULL,
  gender ENUM('Male','Female','Others') NOT NULL,
  email VARCHAR(100) NOT NULL,
  password VARCHAR(255) NOT NULL,
  phone_number VARCHAR(15),
  resume VARCHAR(255),
  photo VARCHAR(255) NOT NULL,
  role ENUM('JobSeeker','CompanyEmployee'),
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);

CREATE TABLE Education (
  user_id INT NOT NULL,
  eid INT NOT NULL,
  school_name VARCHAR(255) NOT NULL,
  field_of_study VARCHAR(255) NOT NULL,
  degree VARCHAR(255) NOT NULL,
  start_date DATE NOT NULL,
  end_date DATE,
  PRIMARY KEY (user_id, eid),
  CONSTRAINT fk_education_user
```

```
  FOREIGN KEY (user_id) REFERENCES Users(uid) ON DELETE CASCADE
);

CREATE TABLE Work_Experience (
  user_id     INT NOT NULL,
  weid       INT NOT NULL,
  job_title    VARCHAR(255) NOT NULL,
  company_name VARCHAR(255) NOT NULL,
  location     VARCHAR(255),
  start_date   DATE NOT NULL,
  end_date     DATE,
  description  TEXT,
  PRIMARY KEY (user_id, weid),
  CONSTRAINT fk_work_user
  FOREIGN KEY (user_id) REFERENCES Users(uid) ON DELETE CASCADE ON
UPDATE CASCADE
);

CREATE TABLE skills (
  sid INT(11) NOT NULL AUTO_INCREMENT,
  user_id INT(11) NOT NULL,
  skill_name VARCHAR(500) NOT NULL,
  languages VARCHAR(500) NOT NULL,
  PRIMARY KEY (sid),
  CONSTRAINT fk_skills_user
  FOREIGN KEY (user_id) REFERENCES users (uid) ON DELETE CASCADE ON
UPDATE CASCADE
```

```
);

CREATE TABLE companies (
  cid INT(11) NOT NULL AUTO_INCREMENT,
  company_name VARCHAR(255) NOT NULL,
  email VARCHAR(255) NOT NULL,
  password VARCHAR(255) NOT NULL,
  description TEXT,
  industry TEXT,
  hq_city VARCHAR(255) NOT NULL,
  owner_name VARCHAR(255) NOT NULL,
  owner_email VARCHAR(255) NOT NULL,
  banner TEXT,
  logo TEXT,
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  parent_cid INT(11) DEFAULT NULL,
  PRIMARY KEY (cid),
  CONSTRAINT fk_parent_id
  FOREIGN KEY (parent_cid)REFERENCES companies (cid) ON DELETE CASCADE
  ON UPDATE CASCADE
);

CREATE TABLE company_code (
  code VARCHAR(10) NOT NULL,
  comp_cid INT(11) NOT NULL,
  PRIMARY KEY (code, comp_cid),
  CONSTRAINT fk_company_id
```

```
  FOREIGN KEY (comp_cid) REFERENCES companies (cid) ON DELETE CASCADE ON
UPDATE CASCADE
);

CREATE TABLE company_employees (
  ceid INT(11) NOT NULL AUTO_INCREMENT,
  employee_uid INT(11) NOT NULL,
  employee_cid INT(11) NOT NULL,
  role_title VARCHAR(100) NOT NULL,
  can_post ENUM('Yes','No') NOT NULL DEFAULT 'No',
  PRIMARY KEY (ceid),
  CONSTRAINT fk_user_employee
    FOREIGN KEY (employee_uid) REFERENCES users (uid) ON DELETE CASCADE ON
UPDATE CASCADE,
  CONSTRAINT fk_company_employee
    FOREIGN KEY (employee_cid) REFERENCES companies (cid) ON DELETE
CASCADE ON UPDATE CASCADE
);

CREATE TABLE jobs (
  jid             INT NOT NULL AUTO_INCREMENT,
  cid             INT NOT NULL,
  title           VARCHAR(255) NOT NULL,
  description     TEXT NOT NULL,
  location        VARCHAR(255),
  employment_type  VARCHAR(255),
  experience_level  VARCHAR(255),
```

```
 min_salary       INT,
 max_salary       INT,
 qualifications   TEXT,
 created_at       TIMESTAMP NOT NULL DEFAULT CURRENT_TIMESTAMP,
 visibility       ENUM('Yes','No') NOT NULL DEFAULT 'Yes',
 PRIMARY KEY (jid),
 CONSTRAINT fk_jobs_company
   FOREIGN KEY (cid) REFERENCES companies (cid) ON DELETE CASCADE ON
UPDATE CASCADE
);
```

CREATE TABLE job_applications (

```
 jaid      INT NOT NULL AUTO_INCREMENT,
 uid       INT NOT NULL,
 jid       INT NOT NULL,
 status    VARCHAR(30) NOT NULL,
 applied_at TIMESTAMP NOT NULL DEFAULT CURRENT_TIMESTAMP,
 PRIMARY KEY (jaid),
 UNIQUE (uid, jid),
 CONSTRAINT fk_jobapp_user
   FOREIGN KEY (uid) REFERENCES users (uid) ON DELETE CASCADE ON UPDATE
CASCADE,
 CONSTRAINT fk_jobapp_job
   FOREIGN KEY (jid) REFERENCES jobs (jid) ON DELETE CASCADE ON UPDATE
CASCADE
);
```

5 Tuples

-- ======================

-- 1) USERS (uid is AUTO_INCREMENT -> omit it)

-- ======================

INSERT INTO Users (fname, lname, age, gender, email, password, phone_number, resume, photo, role, created_at) VALUES ('Rishi', 'Jadhav', 22, 'Male', 'rishi@gmail.com', 'hash123', '6041234567', 'resume1.pdf', 'rishi.jpg', 'JobSeeker', '2025-10-27 10:00:00');

INSERT INTO Users (fname, lname, age, gender, email, password, phone_number, resume, photo, role, created_at) VALUES ('Guransh', 'Singh', 24, 'Male', 'guransh@outlook.com', 'pass456', '6042345678', 'resume2.pdf', 'guransh.png', 'JobSeeker', '2025-10-26 10:00:00');

INSERT INTO Users (fname, lname, age, gender, email, password, phone_number, resume, photo, role, created_at) VALUES ('Akif', 'Baig', 23, 'Male', 'akif.baig@gmail.com', 'abc789', '6043456789', 'resume3.pdf', 'akif.jpg', 'CompanyEmployee', '2025-10-25 10:00:00');

INSERT INTO Users (fname, lname, age, gender, email, password, phone_number, resume, photo, role, created_at) VALUES ('Simran', 'Kaur', 25, 'Female', 'simran.kaur@mail.com', 'pw1234', '6044567890', 'resume4.pdf', 'simran.png', 'JobSeeker', '2025-10-24 10:00:00');

INSERT INTO Users (fname, lname, age, gender, email, password, phone_number, resume, photo, role, created_at) VALUES ('Navtej', 'Singh', 26, 'Male', 'navtej@company.com', 'mypass', '6045678901', 'resume5.pdf', 'navtej.png', 'CompanyEmployee', '2025-10-23 10:00:00');

-- ==

-- 2) COMPANIES (cid is AUTO_INCREMENT -> omit it)

-- Insert parent companies before children (parent_cid)

-- ==

INSERT INTO companies (company_name, email, password, description, industry, hq_city, owner_name, owner_email, banner, logo, parent_cid) VALUES ('TalentConnect Inc.', 'contact@talentconnect.ca', 'tcpass123', 'Job portal for students', 'IT', 'Vancouver', 'Akif Baig', 'akif@talentconnect.ca', 'banner1.jpg', 'logo1.png', NULL);

```
INSERT INTO companies (company_name, email, password, description, industry, hq_city, owner_name, owner_email, banner, logo, parent_cid) VALUES ('NovaTech', 'hr@novatech.ca', 'nova2024', 'Software services provider', 'IT', 'Burnaby', 'Rishi Jadhav', 'rishi@novatech.ca', 'banner2.jpg', 'logo2.png', NULL);


INSERT INTO companies (company_name, email, password, description, industry, hq_city, owner_name, owner_email, banner, logo, parent_cid) VALUES ('Fist of Fury Boxing', 'info@fistfury.ca', 'fistbox', 'Boxing & Fitness gym', 'Sports', 'Surrey', 'Navtej Singh', 'navtej@fistfury.ca', 'banner3.jpg', 'logo3.png', NULL);


INSERT INTO companies (company_name, email, password, description, industry, hq_city, owner_name, owner_email, banner, logo, parent_cid) VALUES ('BizPro Ltd.', 'admin@bizpro.com', 'biz123', 'Business consulting', 'Consulting', 'Richmond', 'Simran Kaur', 'simran@bizpro.com', 'banner4.jpg', 'logo4.png', NULL);


-- Child company of NovaTech (assumes NovaTech got cid = 2)

INSERT INTO companies (company_name, email, password, description, industry, hq_city, owner_name, owner_email, banner, logo, parent_cid) VALUES ('NovaTech Marketing', 'market@novatech.ca', 'novamktg', 'Marketing branch of NovaTech', 'Marketing', 'Burnaby', 'Rishi Jadhav', 'rishi@novatech.ca', 'banner5.jpg', 'logo5.png', 2);


-- ==================================

-- 3) COMPANY_CODE (depends on companies)

-- ==================================

INSERT INTO company_code (code, comp_cid) VALUES ('TC2025', 1);

INSERT INTO company_code (code, comp_cid) VALUES ('NV2025', 2);

INSERT INTO company_code (code, comp_cid) VALUES ('FF2025', 3);

INSERT INTO company_code (code, comp_cid) VALUES ('BP2025', 4);

INSERT INTO company_code (code, comp_cid) VALUES ('NM2025', 5);


-- ==================================

-- 4) EDUCATION (depends on Users)

-- ==================================

INSERT INTO Education (user_id, eid, school_name, field_of_study, degree, start_date, end_date)
```

```
VALUES (1, 1, 'Langara College', 'Computer Science', 'Diploma', '2023-09-01', '2025-04-01');

INSERT INTO Education (user_id, eid, school_name, field_of_study, degree, start_date, end_date)
VALUES (2, 1, 'UBC', 'Information Systems', 'BSc', '2022-09-01', '2026-05-01');

INSERT INTO Education (user_id, eid, school_name, field_of_study, degree, start_date, end_date)
VALUES (3, 1, 'BCIT', 'Software Development', 'Certificate', '2023-01-10', '2024-12-15');

INSERT INTO Education (user_id, eid, school_name, field_of_study, degree, start_date, end_date)
VALUES (4, 1, 'KPU', 'Business Technology', 'Diploma', '2021-09-01', '2023-05-01');

INSERT INTO Education (user_id, eid, school_name, field_of_study, degree, start_date, end_date)
VALUES (5, 1, 'SFU', 'Computer Engineering', 'BEng', '2020-09-01', '2024-06-01');

-- ========================================
-- 5) WORK_EXPERIENCE (depends on Users)
-- ========================================
INSERT INTO Work_Experience (user_id, weid, job_title, company_name, location, start_date, end_date, description)
VALUES (1, 1, 'Web Developer Intern', 'TechNova', 'Vancouver', '2024-05-01', '2024-08-30', 'Built front-end using HTML/CSS/JS.');

INSERT INTO Work_Experience (user_id, weid, job_title, company_name, location, start_date, end_date, description)
VALUES (2, 1, 'Data Analyst', 'FinCore', 'Burnaby', '2023-03-01', NULL, 'Working on SQL data dashboards.');

INSERT INTO Work_Experience (user_id, weid, job_title, company_name, location, start_date, end_date, description)
VALUES (3, 1, 'Backend Developer', 'TalentConnect', 'Surrey', '2024-01-10', NULL, 'Developed PHP APIs and MySQL queries.');
```

```
INSERT INTO Work_Experience (user_id, weid, job_title, company_name, location, start_date, end_date, description)

VALUES (4, 1, 'Marketing Assistant', 'BizPro Ltd.', 'Richmond', '2022-06-01', '2023-03-01', 'Assisted in digital marketing campaigns.');


INSERT INTO Work_Experience (user_id, weid, job_title, company_name, location, start_date, end_date, description)

VALUES (5, 1, 'HR Coordinator', 'Fist of Fury Boxing', 'Vancouver', '2023-04-01', '2025-02-01', 'Managed employee postings and recruitment.');

-- ========================================

-- 6) SKILLS (sid is AUTO_INCREMENT -> omit it)

-- ========================================

INSERT INTO skills (user_id, skill_name, languages) VALUES (1, 'Web Development', 'HTML, CSS, JavaScript');


INSERT INTO skills (user_id, skill_name, languages) VALUES (2, 'Data Analysis', 'SQL, Python');


INSERT INTO skills (user_id, skill_name, languages) VALUES (3, 'Backend Programming', 'PHP, MySQL');


INSERT INTO skills (user_id, skill_name, languages) VALUES (4, 'Marketing & Communication', 'English, Punjabi');


INSERT INTO skills (user_id, skill_name, languages) VALUES (5, 'HR Management', 'Excel, PowerPoint');


-- ====================================================

-- 7) COMPANY_EMPLOYEES (ceid is AUTO_INCREMENT -> omit)

-- ====================================================

INSERT INTO company_employees (employee_uid, employee_cid, role_title, can_post) VALUES (3, 1, 'Developer', 'Yes');
```

```
INSERT INTO company_employees (employee_uid, employee_cid, role_title, can_post)
VALUES (5, 3, 'HR Manager', 'Yes');

INSERT INTO company_employees (employee_uid, employee_cid, role_title, can_post)
VALUES (4, 4, 'Marketing Coordinator', 'No');

INSERT INTO company_employees (employee_uid, employee_cid, role_title, can_post)
VALUES (2, 2, 'Data Analyst', 'No');

INSERT INTO company_employees (employee_uid, employee_cid, role_title, can_post)
VALUES (1, 5, 'Web Admin', 'Yes');


-- ========================================
-- 7) Jobs (jid is AUTO_INCREMENT -> omit it)
-- ========================================

INSERT INTO jobs (cid, title, description, location, employment_type, experience_level, min_salary,
max_salary, qualifications, visibility)
VALUES (1, 'Frontend Developer', 'Develop and maintain responsive web interfaces using HTML, CSS,
and JavaScript.', 'Vancouver', 'Full-time', 'Junior', 55000, 75000, 'Knowledge of HTML, CSS, JS, React
preferred.', 'Yes');

INSERT INTO jobs (cid, title, description, location, employment_type, experience_level, min_salary,
max_salary, qualifications, visibility)
VALUES (2, 'Data Analyst', 'Analyze business data and prepare reports using SQL and Python.', 'Burnaby',
'Full-time', 'Intermediate', 60000, 85000, 'Strong analytical, SQL, and Excel skills required.', 'Yes');

INSERT INTO jobs (cid, title, description, location, employment_type, experience_level, min_salary,
max_salary, qualifications, visibility)
```

```
VALUES (3, 'Fitness Trainer', 'Provide personal and group training sessions for clients.', 'Surrey', 'Part-time', 'Entry', 40000, 55000, 'Certified personal trainer license required.', 'Yes');


INSERT INTO jobs (cid, title, description, location, employment_type, experience_level, min_salary, max_salary, qualifications, visibility)

VALUES (4, 'Marketing Assistant', 'Assist in executing digital marketing campaigns and managing social media.', 'Richmond', 'Internship', 'Entry', 0, 20000, 'Basic knowledge of Canva and social media platforms.', 'No');


INSERT INTO jobs (cid, title, description, location, employment_type, experience_level, min_salary, max_salary, qualifications, visibility)

 VALUES (5, 'Graphic Designer', 'Design marketing visuals, posters, and web graphics.', 'Burnaby', 'Full-time', 'Intermediate', 55000, 75000, 'Experience with Adobe Photoshop and Illustrator.', 'Yes');


-- ========================================

-- 7) job_application (jaid is AUTO_INCREMENT -> omit it)

-- ========================================

INSERT INTO job_applications (uid, jid, status) VALUES (1, 1, 'Pending');


INSERT INTO job_applications (uid, jid, status) VALUES (2, 2, 'Accepted');


INSERT INTO job_applications (uid, jid, status) VALUES (3, 5, 'Pending');


INSERT INTO job_applications (uid, jid, status) VALUES (4, 3, 'Rejected');


INSERT INTO job_applications (uid, jid, status) VALUES (5, 4, 'Interview Scheduled');
```