University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 2

Date: Oct 20th, 2023

Group Number: 108

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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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A brief summary of your project:

We are making an application for the **co-op program**, so the domain would be **student co-op application management**. The database will provide storage and retrieval of data related to various aspects of a co-op program. Some key aspects of the domain that the database will support includes: student profiles, job applications, coordinator information, and application history.

The ER diagram:

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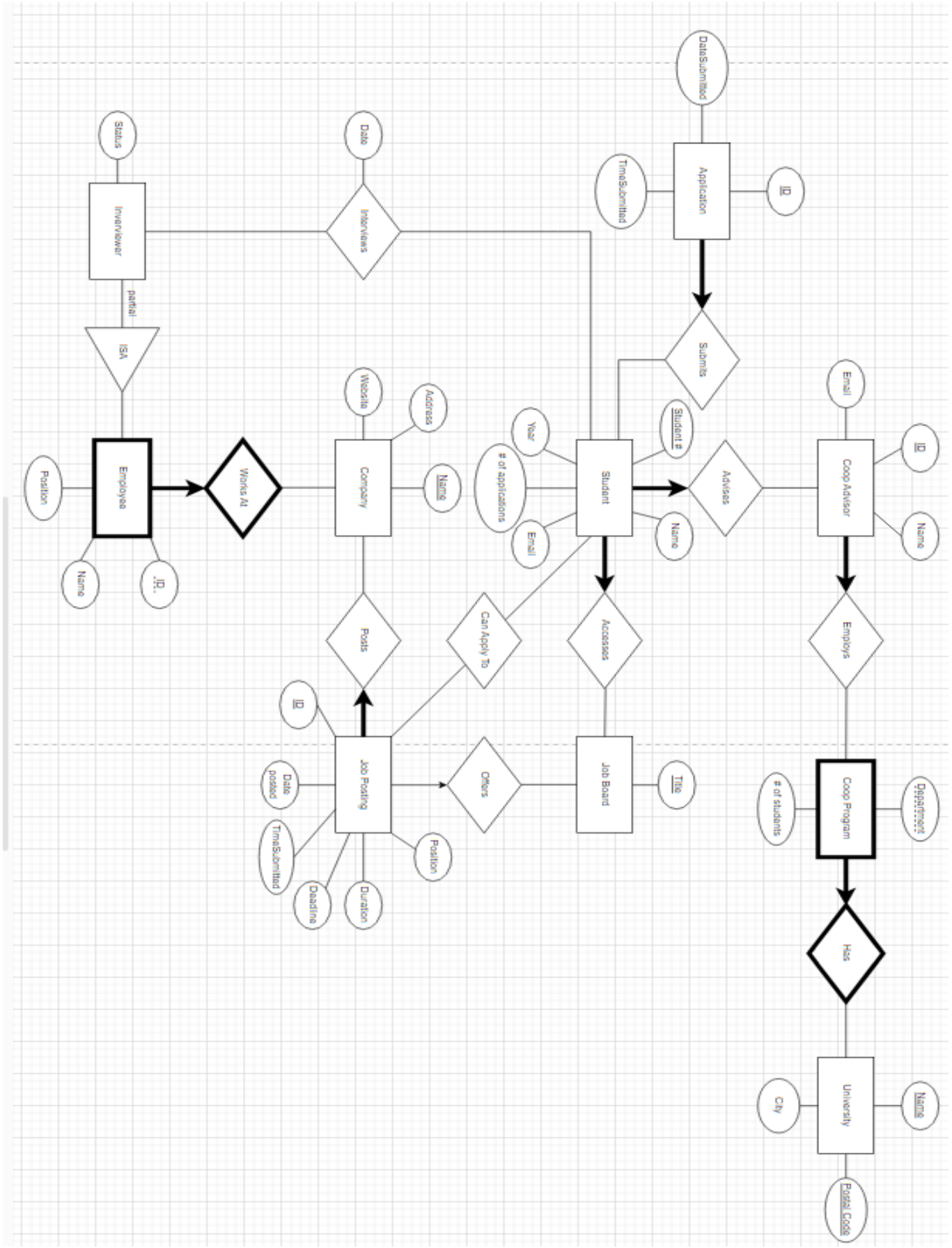

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Changes we have made:

1. Changed the constraint for *Coop Program*
    - reason: We mistakenly had the incorrect relation (now *Coop Program* has to have at least one *Department*)

2. Removed relationship between *Student* and *Company*
    - reason: There already is a connection between the interviewer and student

3. Got rid of unnecessary attributes on the job board
4. Changed the relation between Student and Job Board
    - reason: We mistakenly had the incorrect relation

5. Changed Department to University
6. Made Coop Program a weak entity

The schema derived from your ER diagram:

HasCoopProgram(DeptName: VARCHAR, #ofStudents: INTEGER, UniversityName: VARCHAR, PostalCode: CHAR(6))

- PK: DeptName, UniversityName, PostalCode
- FK: UniversityName, PostalCode

University(UniversityName: VARCHAR, PostalCode: CHAR(6), City: VARCHAR)

- PK: UniversityName, PostalCode

EmployedCoopAdvisor(AdvisorID: INTEGER, AdvisorName: VARCHAR, AdvisorEmail: VARCHAR, DepartmentName: VARCHAR, UniversityName: VARCHAR, PostalCode: CHAR(6))

- PK: AdvisorID
- CK: AdvisorEmail
- FK: DepartmentName, UniversityName, PostalCode
- Constraints: AdvisorEmail: UNIQUE, FacultyName: NOT NULL

AdvisedStudentAccesses(Student#: INTEGER, Name: VARCHAR, Email: VARCHAR, Year: INTEGER, #ofApplications: INTEGER, BoardTitle: VARCHAR, AdvisorID: INTEGER)

- PK: Student#
- CK: Email
- FK: BoardTitle, AdvisorID
- Constraints: BoardTitle: NOT NULL, AdvisorID: NOT NULL

SubmitsApplication(Student#: INTEGER, ApplicationID: INTEGER, DateSubmitted: DATE, TimeSubmitted: Time)

- PK: ApplicationID
- FK: Student#
- Constraints: Student#: NOT NULL

JobBoard(BoardTitle: VARCHAR)
- PK: BoardTitle

JobPostingOfferedPosted(PostingID: INTEGER, DatePosted: DATE, TimePosted: TIME, Deadline: DATE, Duration: INTEGER, Position: VARCHAR, CompanyName: VARCHAR, BoardTitle: VARCHAR)
- PK: PostingID
- FK: CompanyName, BoardTitle
- Constraints: CompanyName: NOT NULL

ApplyTo(Student#: INTEGER, PostingID: INTEGER)
- PK: Student#, PostingID
- FK: Student#, PostingID

Company(CompanyName: VARCHAR, Address: VARCHAR, Website: VARCHAR)
- PK: CompanyName

EmployeeWorksAt(CompanyName: VARCHAR, EmployeeID: INTEGER, EmployeeName: VARCHAR)
- PK: CompanyName, EmployeeID
- FK: CompanyName

Interviewer(CompanyName: VARCHAR, EmployeeID: INTEGER, Status: VARCHAR)
- PK: CompanyName, EmployeeID
- FK: CompanyName, EmployeeID

Interviews(CompanyName: VARCHAR, EmployeeID: INTEGER, Student#: INTEGER, Date: DATE)
- PK: CompanyName, EmployeeID, Student#
- FK: CompanyName, EmployeeID, Student#

Functional Dependencies:

CoopAdvisor
- AdvisorID -> AdvisorName, AdvisorEmail, CoopFacultyName, UniversityName
- AdvisorEmail -> AdvisorName, AdvisorID, CoopFacultyName, University Name

Student
- Student# -> Name, Email, Year, #ofApplications, AdvisorID, BoardTitle
- Email -> Student#, Name, Year, #ofApplications, AdvisorID, BoardTitle

Department
- DeptName, UniversityName->FacultyName

CoopProgram
- FacultyName, DeptName, UniversityName->#ofStudents

JobPosting
- PostingId -> Title, DatePosted, Deadline, Duration, Position, CompanyName, BoardTitle
- CompanyName, Position, DatePosted ->Duration, Deadline, Id,Time, BoardTitle,

- BoardTitle, DatePosted, Time -> PostingId, Deadline, Duration, Position, CompanyName

Company
- Website->CompanyName,Address
- CompanyName -> Address, Website

Employee
- EmployeeID, CompanyName -> EmployeeName, Position

Interviewer
- EmployeeID, CompanyName -> EmployeeName, Status, Position

University
- UniversityName, PostalCode -> City
- PostalCode -> City

Application
- ApplicationId -> DateSubmitted, Student#, TimeSubmitted
- DateSubmitted, Student#, TimeSubmitted -> ApplicationId

Normalization: BCNF

University(UniversityName: VARCHAR, PostalCode: CHAR(6), City: VARCHAR)

⇩

decomposes into

⇩

Location(PostalCode: CHAR(6), City: VARCHAR); *PK: PostalCode*
University (UniversityName: VARCHAR, PostalCode: CHAR(6)); *PK: University, FK: PostalCode*

These ones remain unchanged:

HasCoopProgram(DeptName: VARCHAR, #ofStudents: INTEGER, UniversityName: VARCHAR, PostalCode: CHAR(6))

- PK: DeptName, UniversityName, PostalCode
- FK: UniversityName, PostalCode

EmployedCoopAdvisor(AdvisorID: INTEGER, AdvisorName: VARCHAR, AdvisorEmail: VARCHAR, DepartmentName: VARCHAR, UniversityName: VARCHAR, PostalCode: CHAR(6))

- PK: AdvisorID
- CK: AdvisorEmail
- FK: DepartmentName, UniversityName, PostalCode
- Constraints: AdvisorEmail: UNIQUE, FacultyName: NOT NULL

AdvisedStudentAccesses(Student#: INTEGER, Name: VARCHAR, Email: VARCHAR, Year: INTEGER, #ofApplications: INTEGER, BoardTitle: VARCHAR, AdvisorID: INTEGER)

- PK: Student#
- CK: Email
- FK: BoardTitle, AdvisorID

- Constraints: BoardTitle: NOT NULL, AdvisorID: NOT NULL

SubmitsApplication(Student#: INTEGER, ApplicationID: INTEGER, DateSubmitted: DATE, TimeSubmitted: Time)

- PK: ApplicationID
- FK: Student#
- Constraints: Student#: NOT NULL

JobBoard(BoardTitle: VARCHAR)

- PK: BoardTitle

JobPostingOfferedPosted(PostingID: INTEGER, DatePosted: DATE, TimePosted: TIME, Deadline: DATE, Duration: INTEGER, Position: VARCHAR, CompanyName: VARCHAR, BoardTitle: VARCHAR)

- PK: PostingID
- FK: CompanyName, BoardTitle
- Constraints: CompanyName: NOT NULL

ApplyTo(Student#: INTEGER, PostingID: INTEGER)

- PK: Student#, PostingID
- FK: Student#, PostingID

Company(CompanyName: VARCHAR, Address: VARCHAR, Website: VARCHAR)

- PK: CompanyName

EmployeeWorksAt(CompanyName: VARCHAR, EmployeeID: INTEGER, EmployeeName: VARCHAR)

- PK: CompanyName, EmployeeID
- FK: CompanyName

Interviewer(CompanyName: VARCHAR, EmployeeID: INTEGER, Status: VARCHAR)

- PK: CompanyName, EmployeeID
- FK: CompanyName, EmployeeID

Interviews(CompanyName: VARCHAR, EmployeeID: INTEGER, Student#: INTEGER, Date: DATE)

- PK: CompanyName, EmployeeID, Student#
- FK: CompanyName, EmployeeID, Student#

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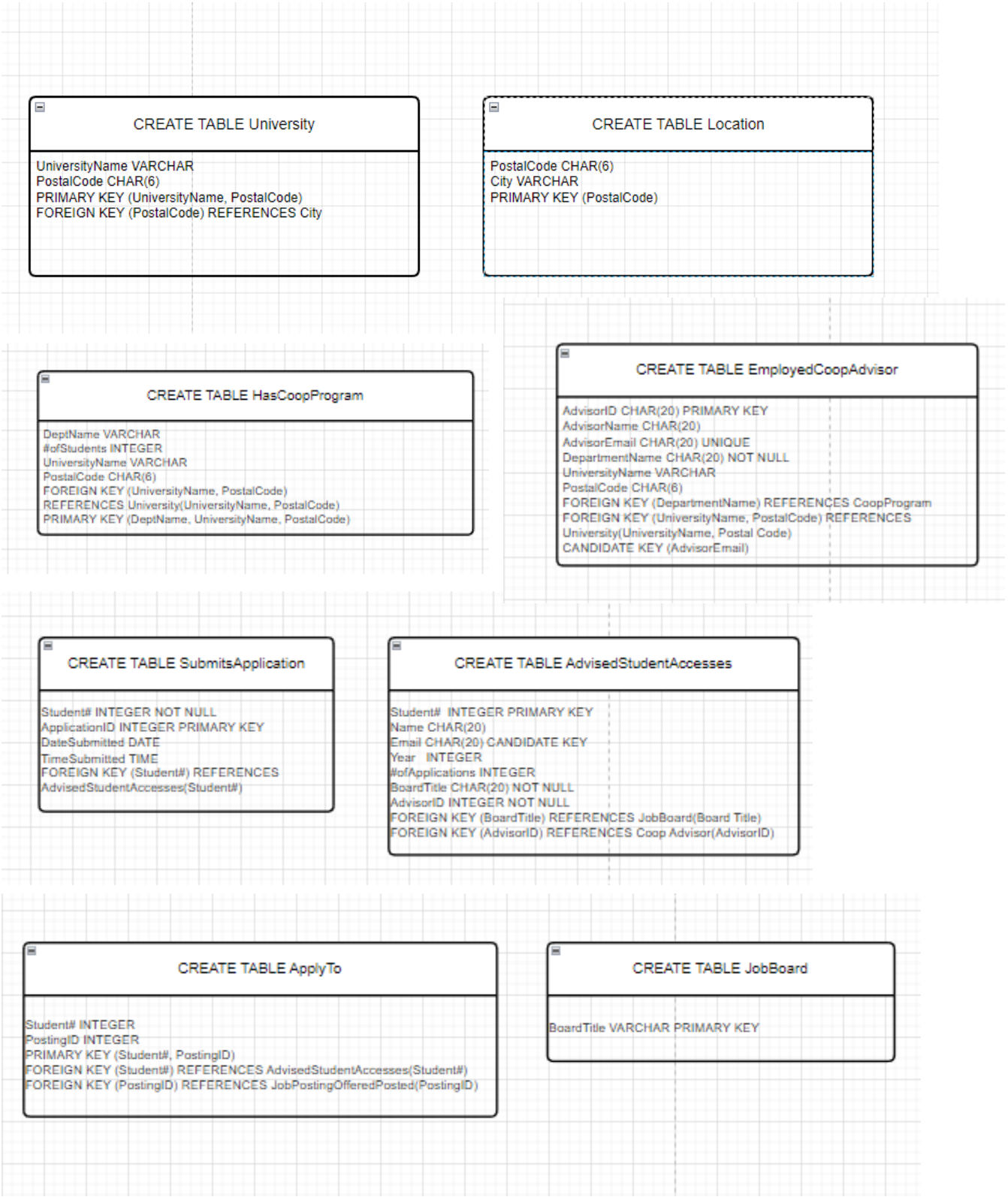
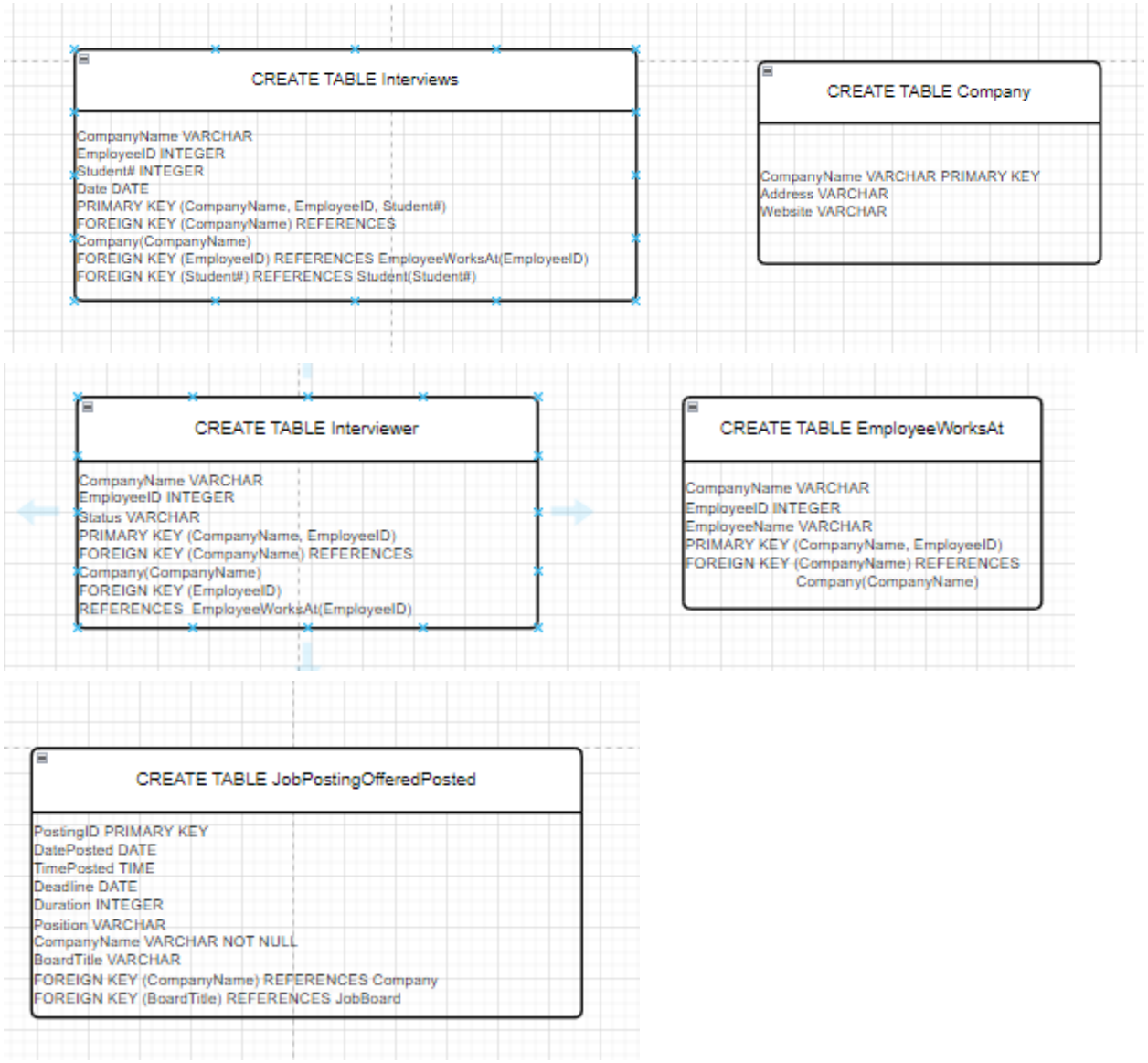
The SQL DDL statements required to create all the tables from item *Normalization*:





INSERT statements to populate each table with at least 5 tuples:

INSERT INTO **HasCoopProgram**(DeptName, #ofStudents, UniversityName, PostalCode)
VALUES

(“Dept 1”, 700, “UBC”, “123456”),
(“Dept 2”, 500, “Waterloo”, “654321”),
(“Dept 3”, 550, “SFU”, “987654”),
(“Dept 4”, 200, “Western”, “abcdef”),
(“Dept 5”, 300, “UofT”, “uvwxyz”);

INSERT INTO **Location**(PostalCode, City)
VALUES
("123456", "Vancouver"),
("654321", "Waterloo"),
("987654", "SFU"),
("abcdef", "Western"),
("uvwxyz", "UofT");

INSERT INTO **University** (UniversityName, PostalCode)
VALUES
("UBC", "123456"),
("Waterloo", "654321"),
("SFU", "987654"),
("Western", "abcdef"),
("UofT", "uvwxyz");

INSERT INTO **EmployedCoopAdvisor**(AdvisorID, AdvisorName, AdvisorEmail, DepartmentName, UniversityName, PostalCode)
VALUES
(1, "advisor 1", "advisor1@ubc.ca, "Dept 1", "UBC", "123456"),
(2, "advisor 2", "advisor2@waterloo.ca, "Dept 2", "Waterloo", "654321"),
(3, "advisor 3", "advisor3@sfu.ca, "Dept 3", "SFU", "987654"),
(4, "advisor 4", "advisor4@western.ca, "Dept 4", "Western", "abcdef"),
(5, "advisor 5", "advisor5@uoft.ca, "Dept 5", "UofT", "uvwxyz");

INSERT INTO **AdvisedStudentAccesses**(Student#, Name, Email, Year, #ofApplications, BoardTitle, AdvisorID)
VALUES
(1, "student 1", "student1@ubc.ca, 3, 10, "Board 1", 1),
(2, "student 2", "student2@waterloo.ca, 2, 15, "Board 1", 2),
(3, "student 3", "student3@sfu.ca, 3, 12, "Board 1", 3),
(4, "student 4", "student4@western.ca, 4, 20, "Board 2", 4),
(5, "student 5", "student5@uoft.ca, 2, 1, "Board 2", 5);

INSERT INTO **SubmitsApplication(**Student#, ApplicationID, DateSubmitted, TimeSubmitted)
VALUES
(1, 101, "2023-10-20", "09:30:00"),
(2, 102, "2023-10-20", "09:30:01"),
(3, 103, "2023-10-20", "09:30:02"),
(4, 104, "2023-10-20", "09:30:03"),
(5, 105, "2023-10-20", "09:30:04");

INSERT INTO **JobBoard**(BoardTitle)
VALUES
("Board 1"),
("Board 2"),
("Board 3"),
("Board 4"),
("Board 5");

INSERT INTO **JobPostingOfferedPosted**(PostingID, DatePosted, TimePosted, Deadline, Duration, Position, CompanyName, BoardTitle)
VALUES
(6, "2023-10-19, "08:00:00", "2023-10-20", 4, "Researcher", "Company 1", "Board 1"),
(7, "2023-10-19, "08:00:00", "2023-10-20", 8, "QA Tester", "Company 2", "Board 2"),
(8, "2023-10-19, "08:00:00", "2023-10-20", 4, "IT Specialist", "Company 3", "Board 3"),
(9, "2023-10-19, "08:00:00", "2023-10-20", 12, "Data Analyst", "Company 4", "Board 4"),
(10, "2023-10-19, "08:00:00", "2023-10-20", 16, "Software Engineer", "Company 5", "Board 5");

INSERT INTO **ApplyTo**(Student#, PostingID)
VALUES
(1, 6),
(2, 7),
(3, 8),
(4, 9),
(5, 10);

INSERT INTO **Company**(CompanyName, Address, Website)
VALUES
("Company 1", "Address1", "www.company1.com"),
("Company 2", "Address2", "www.company2.com"),
("Company 3", "Address3", "www.company3.com"),
("Company 4", "Address4", "www.company4.com"),
("Company 5", "Address5", "www.company5.com");

INSERT INTO **EmployeeWorksAt**(CompanyName, EmployeeID, EmployeeName)
VALUES
("Company 1", 201, "Employee 1"),
("Company 2", 202, "Employee 2"),
("Company 3", 203, "Employee 3"),
("Company 4", 204, "Employee 4"),
("Company 5", 205, "Employee 5");

INSERT INTO **Interviewer**(CompanyName, EmployeeID, Status)
VALUES
("Company 1", 201, "interviewing"),
("Company 2", 202, "interviewing"),
("Company 3", 203, "not interviewing"),
("Company 4", 204, "not interviewing"),
("Company 5", 205, "not interviewing");

INSERT INTO **Interviews**(CompanyName, EmployeeID, Student#, Date)
VALUES
("Company 1", 201, 1, "2023-10-22"),
("Company 2", 202, 2, "2023-10-22"),
("Company 3", 203, 3, "2023-10-22"),
("Company 4", 204, 4, "2023-10-22"),
("Company 5", 205, 5, "2023-10-22");