RYERSON UNIVERSITY

CIND110
DATA ORGANIZATION FOR DATA ANALYSTS

ASSIGNMENT 1
REVERSE AND FORWARD ENGINEER A DATABASE

SECTION: DK0
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Part 2: Cardinality Ratios

EMPLOYEE → DEPARTMENT has a 1:1 one-to-one cardinality ratio as only one employee can manage at most one department and a department can have at most one manager.

WORKS_ON → PROJECT has a M:N many-to-many cardinality ratio as an employee can work on many projects and a project can have many multiple employees.

EMPLOYEE → DEPENDENTS has a 1:N one-to-many cardinality ratio as one employee can have many dependents.

DEPARTMENT → PROJECT has 1:N one-to-many cardinality ratio as one department can have many ongoing projects but a project cannot exist across many departments.

DEPARTMENT → DEPT_LOCATIONS has a M:N many-to-many cardinality ratio as a department can have multiple locations and a location can have many departments there.

- Employee.Super.ssn → Employee.Ssn is a recursive/self-referencing relationship where Super.ssn will reference back to Ssn but also will have a 1:N one-to-many cardinality ratio as one supervisor can have many supervisees but a supervisee can only have one supervisor.

SUBMISSION PART 1:
See submitted file: CIND110_ASSIGNMENT1_AS_SQLSCRIPT.sql

SUBMISSION PART 2:
See submitted file: CIND110_ASSIGNMENT1_AS_MODEL.mwb
See submitted file: CIND110_ASSIGNMENT1_AS_EERDiagram.PNG

SUBMISSION PART 3:

The submitted files successfully satisfy the context of Assignment 1 where the criteria of the four context points have been completed.

Given the schema outline of the existing data from a company, a relational database was created containing six different entities and their respective attributes. The SQL Script file describes the creation and migration of the logical data model to a physical data model.

After migrating the existing data into the new database, the entities with valuable features were enriched by applying entity and referential integrity constraints to ensure the consistency of any updates or modification to the data and to ensure key data inputs are not missing in the database. Basic retrieval queries on the database were performed to ensure and verify the new database is functional.

Verify using basic retrieval on created tables within the database:

```
234 •  SELECT * FROM Employee;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

Fname	Minit	Lname	Ssn	BDate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000.00	888665555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000.00	333445555	5
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000.00	NULL	1
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000.00	888665555	4
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000.00	987654321	4
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000.00	987654321	4
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Employee 1 ×

Verify using basic retrieval query within a table with conditions:

```
235 •  SELECT Employee.Fname, Employee.Lname, Employee.Dno
236    FROM Employee
237    WHERE Dno = 5;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Fname	Lname	Dno
John	Smith	5
Franklin	Wong	5
Joyce	English	5
Ramesh	Narayan	5

These relationships can also be visualized as seen in the EER diagram produced (see .PNG file for EER diagram). The EER diagram is a more dynamic visualization of the relationships between the entities within the database than the relational database schema originally provided in the assignment.

Therefore, submitted files have met the context of Assignment 1 by creating the foundation of a new database on a new platform and functional for data extraction and analyzing.