IT 214 DL7

10/9/2023

P1 Project Assignment Happy

Learning Kindergarten Database Conceptual Analysis:

Main Entities Involved:

1. **CLASS:** This entity represents the classes in the kindergarten, which are associated with specific age levels. Each class has attributes like ClassCode, RoomNumber, PhoneNumber, MaxCapacity, and Directions.
2. **STUDENT:** This entity represents the students enrolled in the kindergarten. It includes attributes like FirstName, LastName, MiddleName, Nickname, DateOfBirth, Address, etc.
3. **PARENT:** This entity represents the parents or caretakers of the students. It includes attributes such as FirstName, LastName, MiddleName, HomePhone, MobilePhone, WorkPhone, PersonalEmail, and Relationship.
4. **TEACHER:** This entity represents the teachers in the kindergarten. It includes attributes like FirstName, LastName, MiddleName, HomePhone, WorkEmail, PersonalEmail, CollegeGraduated, HighestDegree, and DegreeArea.

Main Relationship Involved:

1. **STUDENT_ENROLLMENT:** This relationship connects the STUDENT entity with the CLASS entity, representing the enrollment of students in specific classes.

Relationship Type and Explanation:

- **STUDENT_ENROLLMENT Relationship Type:** This relationship is a many-to-one relationship because multiple students can enroll in the same class (many students to one class). However, each student can only be enrolled in one class at a time (one class to one student). This relationship type was determined based on the fact that a student can belong to only one class simultaneously, but multiple students can belong to the same class.

Many-to-Many Relationship and Bridge Table:

In this database design, there is a many-to-many relationship between TEACHER and CLASS entities. Each class can have multiple teachers, and each teacher can teach multiple classes. To represent this relationship, we need a bridge table and two other relationships:

Bridge Table (TEACHER_CLASS_ASSIGNMENT): This bridge table connects TEACHER and CLASS entities, allowing us to associate multiple teachers with multiple classes.

Two Other Relationships:

1. **TEACHER_CLASS_ASSIGNMENT to TEACHER:** This relationship connects the bridge table with the TEACHER entity, indicating which teachers are assigned to which classes.
2. **TEACHER_CLASS_ASSIGNMENT to CLASS:** This relationship connects the bridge table with the CLASS entity, indicating which classes are taught by which teachers. This conceptual analysis helps in understanding the key entities, relationships, and their types, which will be used to create the Entity Relationship Diagram (ERD) and design the database in MySQL Workbench.

Entities Analysis

Entity: CLASS

- **Entity Description:** The CLASS entity represents the classes in the kindergarten. Each class is associated with a specific age level and has attributes such as ClassCode, RoomNumber, PhoneNumber, MaxCapacity, and Directions.

Attribute Table:

Attribute name	Attribute Domain/size	Simple/ Composite	Single/ Multi value	Required/ Optional	Unique/ Duplicate
CLASS_ID	INT	SIMPLE	SINGLE	REQUIRED	UNIQUE
CLASS_CODE	VARCHAR(50)	SIMPLE	SINGLE	REQUIRED	UNIQUE
ROOM_NUMBER	INT	SIMPLE	SINGLE	REQUIRED	DUPLICATED
PHONE_NUMBER	VARCHAR(14)	SIMPLE	SINGLE	REQUIRED	DUPLICATED
MAX_CAPACITY	INT	SIMPLE	SINGLE	REQUIRED	N/A
DIRECTIONS	VARCHAR(130)	SIMPLE	SINGLE	REQUIRED	N/A

AGE_LEVEL_ID	INT	SIMPLE	SINGLE	REQUIRED	N/A

Primary Key: Class_ID (Simple)

- **Entity Description:** The STUDENT entity represents the students enrolled in the kindergarten. It includes attributes such as FirstName, LastName, MiddleName, Nickname, DateOfBirth, Address, and City.

Attribute Table:

Attribute name	Attribute Domain/size	Simple/ Composite	Single/ Multi value	Required/ Optional	Unique/ Duplicate
STUDENT_ID	INT	SIMPLE	SINGLE	REQUIRED	UNIQUE
FIRST_NAME	VARCHAR(22)	SIMPLE	SINGLE	REQUIRED	N/A
LAST_NAME	VARCHAR(22)	SIMPLE	SINGLE	REQUIRED	N/A
MIDDLE_NAME	VARCHAR(22)	SIMPLE	SINGLE	OPTIONAL	N/A
NICK_NAME	VARCHAR(22)	SIMPLE	SINGLE	OPTIONAL	N/A
BIRTH_DATE	DATE	SIMPLE	SINGLE	REQUIRED	N/A
ADDRESS	VARCHAR(100)	SIMPLE	SINGLE	REQUIRED	N/A
CITY	VARCHAR(15)	SIMPLE	SINGLE	REQUIRED	N/A
ZIPCODE	CHAR(5)	SIMPLE	SINGLE	REQUIRED	N/A
STREET	VARCHAR(35)	SIMPLE	SINGLE	REQUIRED	N/A
CLASS_ID	INT	SIMPLE	SINGLE	REQUIRED	N/A

Primary Key: Student_ID (Simple) **Entity:**

PARENT

- **Entity Description:** The PARENT entity represents the parents or caretakers of the students. It includes attributes such as FirstName, LastName, MiddleName, HomePhone, MobilePhone, WorkPhone, PersonalEmail, and Relationship.

Attribute Table:

Attribute name	Attribute Domain/size	Simple/ Composite	Single/ Multi value	Required/ Optional	Unique/ Duplicate
PARENT_ID	INT	SIMPLE	SINGLE	REQUIRED	UNIQUE
FIRST_NAME	VARCHAR(22)	SIMPLE	SINGLE	REQUIRED	N/A
LAST_NAME	VARCHAR(22)	SIMPLE	SINGLE	REQUIRED	N/A

MIDDLE_NAME	VARCHAR(22)	SIMPLE	SINGLE	OPTIONAL	N/A
HOME_PHONE	VARCHAR(14)	SIMPLE	SINGLE	REQUIRED	N/A
MOBILE_PHONE	VARCHAR(14)	SIMPLE	SINGLE	OPTIONAL	N/A
WORK_PHONE	VARCHAR(30)	SIMPLE	SINGLE	OPTIONAL	N/A
EMAIL	VARCHAR(30)	SIMPLE	SINGLE	OPTIONAL	N/A
RELATIONSHIP	VARCHAR(20)	SIMPLE	SINGLE	REQUIRED	N/A
STUDENT_ID	INT	SIMPLE	SINGLE	REQUIRED	N/A

Primary Key: ParentID (Simple)

Entity: TEACHER

- **Entity Description:** The TEACHER entity represents the teachers in the kindergarten. It includes attributes such as FirstName, LastName, MiddleName, HomePhone, WorkEmail, PersonalEmail, CollegeGraduated, HighestDegree, and DegreeArea.

Attribute Table:

Attribute name	Attribute Domain/size	Simple/ Composite	Single/ Multi value	Required/ Optional	Unique/ Duplicate
TEACER_ID	INT	SIMPLE	SINGLE	SINGLE	REQUIRED
FIRST_NAME	VARCHAR(22)	SIMPLE	SINGLE	SINGLE	REQUIRED
LAST_NAME	VARCHAR(22)	SIMPLE	SINGLE	SINGLE	REQUIRED
MIDDLE_NAME	VARCHAR(22)	SIMPLE	SINGLE	SINGLE	OPTIONAL
HOME_PHONE	VARCHAR(14)	SIMPLE	SINGLE	SINGLE	OPTONAL
WORK_EMAIL	VARCHAR(50)	SIMPLE	SINGLE	SINGLE	REQUIRED
PERSONAL_ EMAIL	VARCHAR(30)	SIMPLE	SINGLE	SINGLE	OPTIONAL
COLLEGE_ GRADUATED	VARCHAR(50)	SIMPLE	SINGLE	SINGLE	REQUIRED
HIGHEST_ DEGREE	VARCHAR(5)	SIMPLE	SINGLE	SINGLE	REQUIRED
DEGREE_AREA	VARCAHR(25)	SIMPLE	SINGLE	SINGLE	REQUIRED

Primary Key: TeacherID (Simple)

Bridge Entity: TEACHER_CLASS_ASSIGNMENT

- **Entity Description:** The TEACHER_CLASS_ASSIGNMENT entity serves as a bridge table to represent the many-to-many relationship between teachers and classes.

Relationship Name: PARENT_STUDENT_RELATIONSHIP

- The name is in the form of a verb phrase in the 3rd singular form, indicating the relationship between parents and students.

Relationship Type with Explanation:

- Relationship Type: This is a "Parent-to-Child" relationship, where a parent is connected to their child(ren) who is/are enrolled in the kindergarten.
- Explanation: In this relationship, each parent (or caretaker) is associated with one or more children who are students at the kindergarten. Conversely, each child (student) has one or more parents or caretakers. This relationship is a classic example of a one-to-many (1:N) relationship, as each parent can have multiple children, but each child typically has only one set of parents.

Relationship Strength with Explanation:

- Relationship Strength: This relationship is strong.
- Explanation: The relationship is strong because it directly connects parents to their children. Parents have a direct responsibility for and connection to their children enrolled in the kindergarten.

Entities Participation in the Relationship with Explanations:

- PARENT Entity Participation: Parents participate in this relationship as the "parent" side. They are associated with one or more students (children).
- STUDENT Entity Participation: Students (children) participate in this relationship as the "child" side. Each student is associated with one or more parents or caretakers.

Special Cardinality:

- There is no special cardinality specified for this relationship. However, it is worth noting that while each student typically has one or more parents or caretakers, some exceptional cases may involve more complex family structures with multiple parents or guardians. In summary, the "PARENT_STUDENT_RELATIONSHIP" is a strong one-to-many (1:N) relationship connecting parents (PARENT entity) to their children (STUDENT entity) enrolled in the kindergarten. Each parent can have multiple children, but each child typically has one set of parents.

MWB Report:

In this database design project, we have created a database schema to efficiently manage Happy Learning Kindergarten's operations. The design encompasses essential entities such as age levels, classes, students, parents, and teachers. Each entity has been equipped with relevant attributes to store comprehensive information. Relationships have been established, ensuring that parents are associated with their children, teachers are assigned to classes, and students are enrolled in specific classes. To maintain data integrity, primary keys and foreign keys have been carefully defined. This design forms a solid foundation for the kindergarten's database system, facilitating effective management and organization of their operations.

ERD:

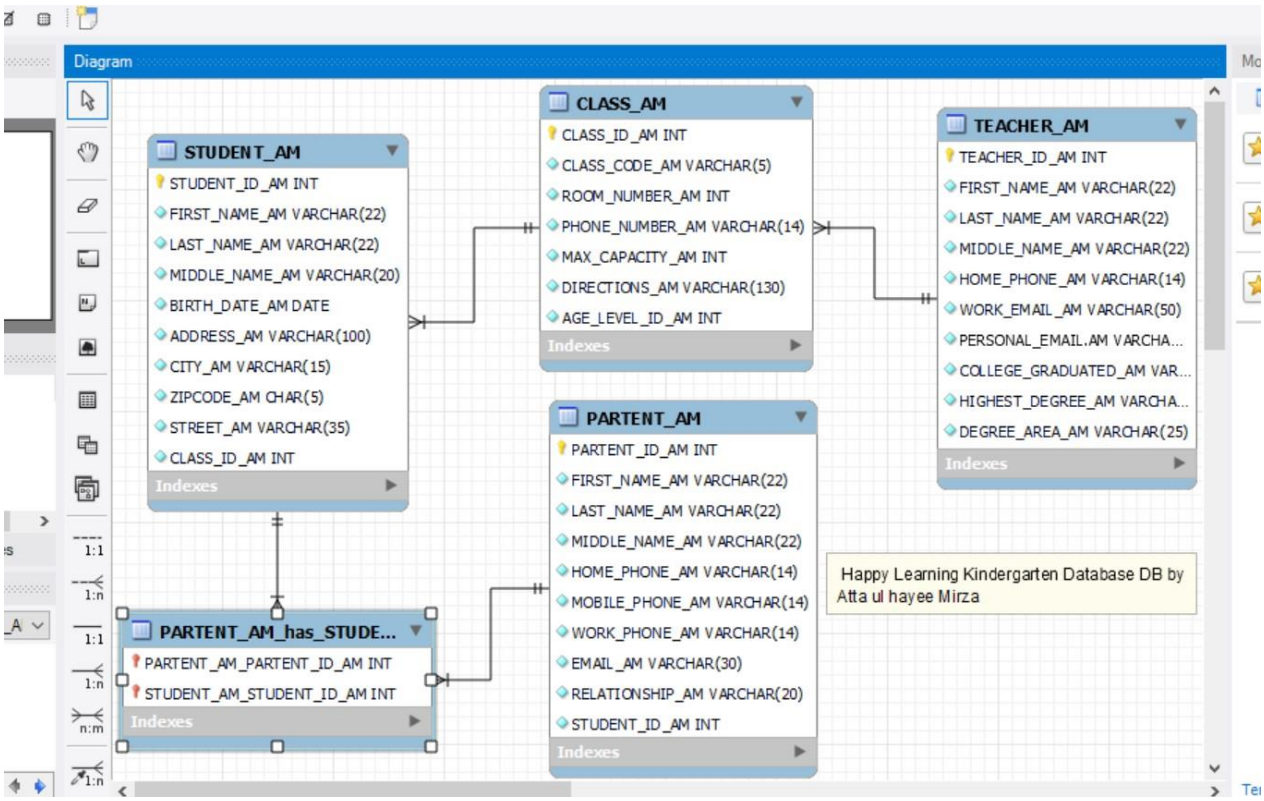
Diagram
STUDENT_AM
STUDENT_ID_AM INT
FIRST_NAME_AM VARCHAR(22)
LAST_NAME_AM VARCHAR(22)
MIDDLE_NAME_AM VARCHAR(20)
BIRTH_DATE_AM DATE
ADDRESS_AM VARCHAR(100)
CITY_AM VARCHAR(15)
ZIPCODE_AM CHAR(5)
STREET_AM VARCHAR(35)
CLASS_ID_AM INT
Indexes
CLASS_AM
CLASS_ID_AM INT
CLASS_CODE_AM VARCHAR(5)
ROOM_NUMBER_AM INT
PHONE_NUMBER_AM VARCHAR(14)
MAX_CAPACITY_AM INT
DIRECTIONS_AM VARCHAR(130)
AGE_LEVEL_ID_AM INT
Indexes
TEACHER_AM
TEACHER_ID_AM INT
FIRST_NAME_AM VARCHAR(22)
LAST_NAME_AM VARCHAR(22)
MIDDLE_NAME_AM VARCHAR(22)
HOME_PHONE_AM VARCHAR(14)
WORK_EMAIL_AM VARCHAR(50)
PERSONAL_EMAIL.AM VARCHA...
COLLEGE_GRADUATED_AM VAR...
HIGHEST_DEGREE_AM VARCHA...
DEGREE_AREA_AM VARCHAR(25)
Indexes
PARTENT_AM
PARTENT_ID_AM INT
FIRST_NAME_AM VARCHAR(22)
LAST_NAME_AM VARCHAR(22)
MIDDLE_NAME_AM VARCHAR(22)
HOME_PHONE_AM VARCHAR(14)
MOBILE_PHONE_AM VARCHAR(14)
WORK_PHONE_AM VARCHAR(14)
EMAIL_AM VARCHAR(30)
RELATIONSHIP_AM VARCHAR(20)
STUDENT_ID_AM INT
Indexes
PARTENT_AM_has_STUDE...
PARTENT_AM_PARTENT_ID_AM INT
STUDENT_AM_STUDENT_ID_AM INT
Indexes
Happy Learning Kindergarten Database DB by
Atta ul hayee Mirza
1:1
1:n
1:1
1:n
n:m
1:n