CS301 – Database Management System
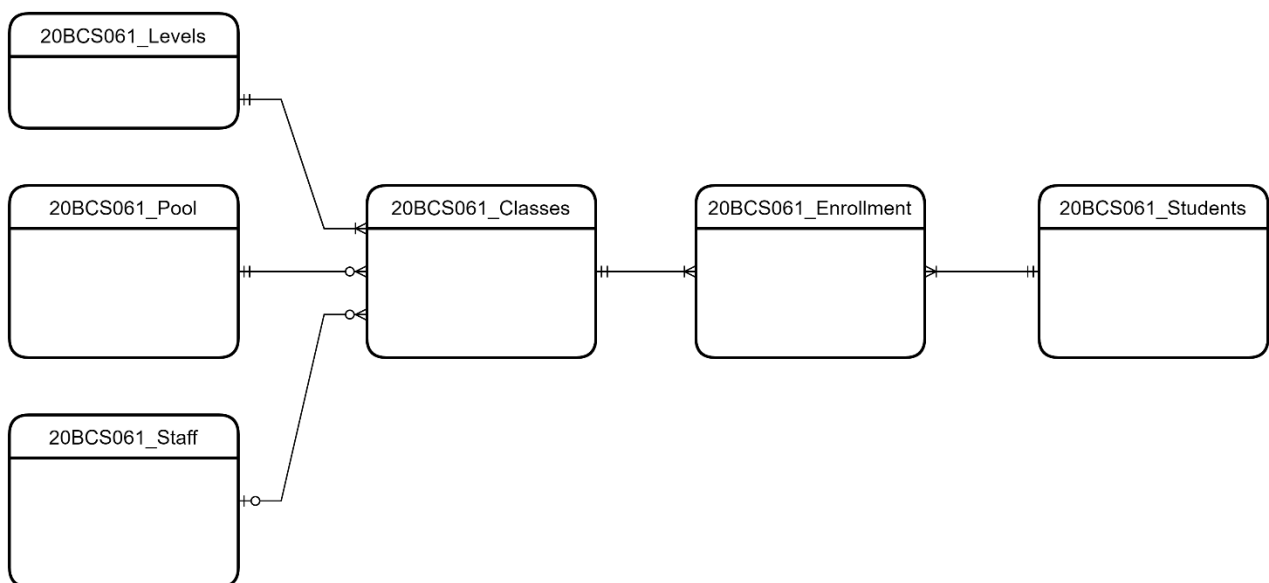
20BCS061 – Udit Jain || Quiz 1

Q1 - Relationship Schema

- 20BCS061_Levels(Level, ClassName)
- 20BCS061_Pool(Pool, PoolName, Location)
- 20BCS061_Staff(StaffID, FirstName, MiddleInitial, LastName, Suffix, Salaried, PayAmount)
- 20BCS061_Classes(LessonIndex, Level, Pool, Instructor, SectionID, Semester, Days, Time, Limit, Enrolled, Price)
- 20BCS061_Enrollment(LessonIndex, SID, Status, AmountPaid, DateEnrolled)
- 20BCS061_Students(SID, FirstName, MiddleInitial, LastName, Suffix, Birthday, LocalStreet, LocalCity, LocalPostCode, LocalPhone)
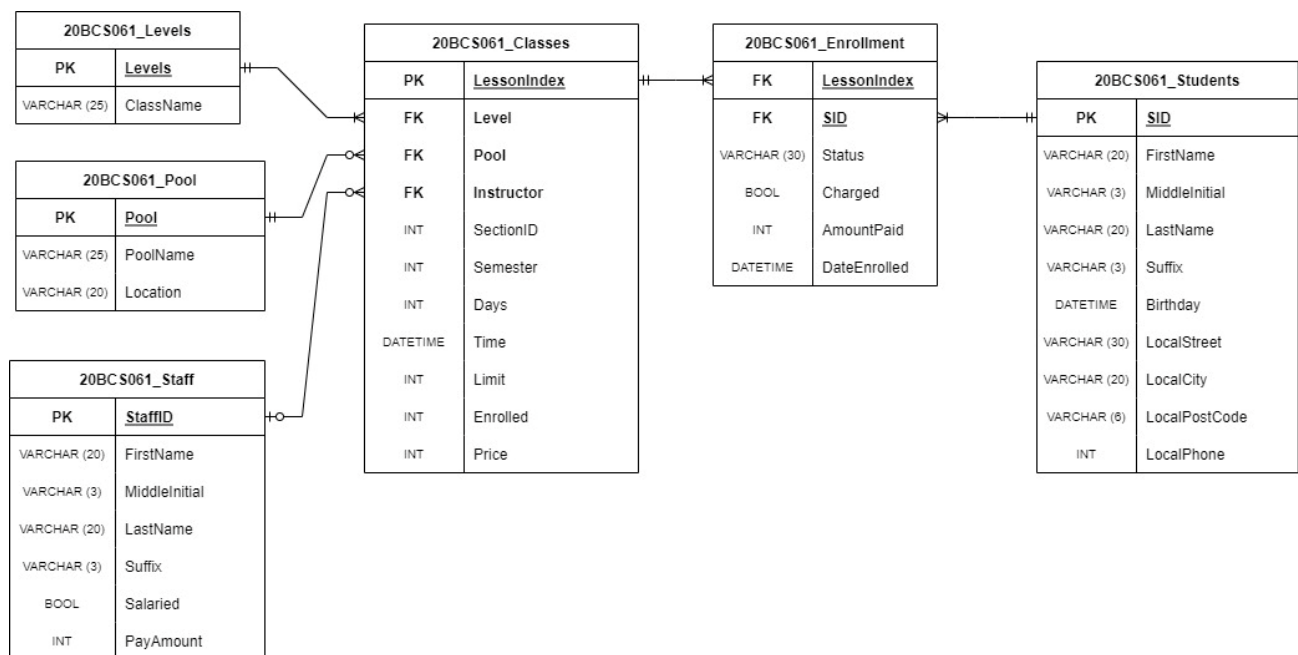
Q2 - Cardinality

- 20BCS061_Staff   [Optional 1-Optional Many]   20BCS061_Classes
- 20BCS061_Pool   [Mandatory 1-Optional Many]   20BCS061_Classes
- 20BCS061_Levels [Mandatory 1-Mandatory Many]   20BCS061_Classes
- 20BCS061_Classes   [Mandatory 1-Mandatory Many]   20BCS061_Enrollment
- 20BCS061_Enrollment   [Mandatory Many- Mandatory 1] 20BCS061_Students

Q1 - Conceptual Diagram

Q3 - Physical Diagram

20BCS061_Levels

PK	Levels
VARCHAR (25)	ClassName

20BCS061_Pool

PK	Pool
VARCHAR (25)	PoolName
VARCHAR (20)	Location

20BCS061_Staff

PK	StaffID
VARCHAR (20)	FirstName
VARCHAR (3)	MiddleInitial
VARCHAR (20)	LastName
VARCHAR (3)	Suffix
BOOL	Salaried
INT	PayAmount

20BCS061_Classes

PK	LessonIndex
FK	Level
FK	Pool
FK	Instructor
INT	SectionID
INT	Semester
INT	Days
DATETIME	Time
INT	Limit
INT	Enrolled
INT	Price

20BCS061_Enrollment

FK	LessonIndex
FK	SID
VARCHAR (30)	Status
BOOL	Charged
INT	AmountPaid
DATETIME	DateEnrolled

20BCS061_Students

PK	SID
VARCHAR (20)	FirstName
VARCHAR (3)	MiddleInitial
VARCHAR (20)	LastName
VARCHAR (3)	Suffix
DATETIME	Birthday
VARCHAR (30)	LocalStreet
VARCHAR (20)	LocalCity
VARCHAR (6)	LocalPostCode
INT	LocalPhone

Question 4 – List Weak Entity

In the above Diagram 20BCS061_Enrollment is an associative entity since it's a M:N relation between 20BCS061_Classes and 20BCS061_Students, with added attributes. Associative Entities can also be called as weak entities. The table "Enrollment" has no meaning without Classes and Students since you cannot "enroll" without either of the objects. It needs an instance of the Parent Entities to create an instance of the enrolment Table. The enrolment table consists of a composite key which is made from the primary key of Classes, Students.

In this case we cannot make it a strong entity by just adding a primary key to "20BCS061_Enrolment" as it will be redundant as we can uniquely identify every row by using the composite key.

Question 5 – Data Redundancy

There is no data redundancy present in the table since there are no two instances of the same person in two different tables representing the same data. The database however can be improvised using generalization. A people entity can be added to include "FirstName", "MiddleInitial", "LastName" and add a relation to both Instructor and Student