

# 1 Draw the ER Diagram

## Question 1: Draw the ER Diagram

(50 points)

Draw an Entity Relationship Diagram based on the following description.

If your connecting lines need to cross, make it obvious which way the line goes! Jump over the line, put matching hash marks on the the lines, make one line heavier than the other... Do something so we know what connects with what.

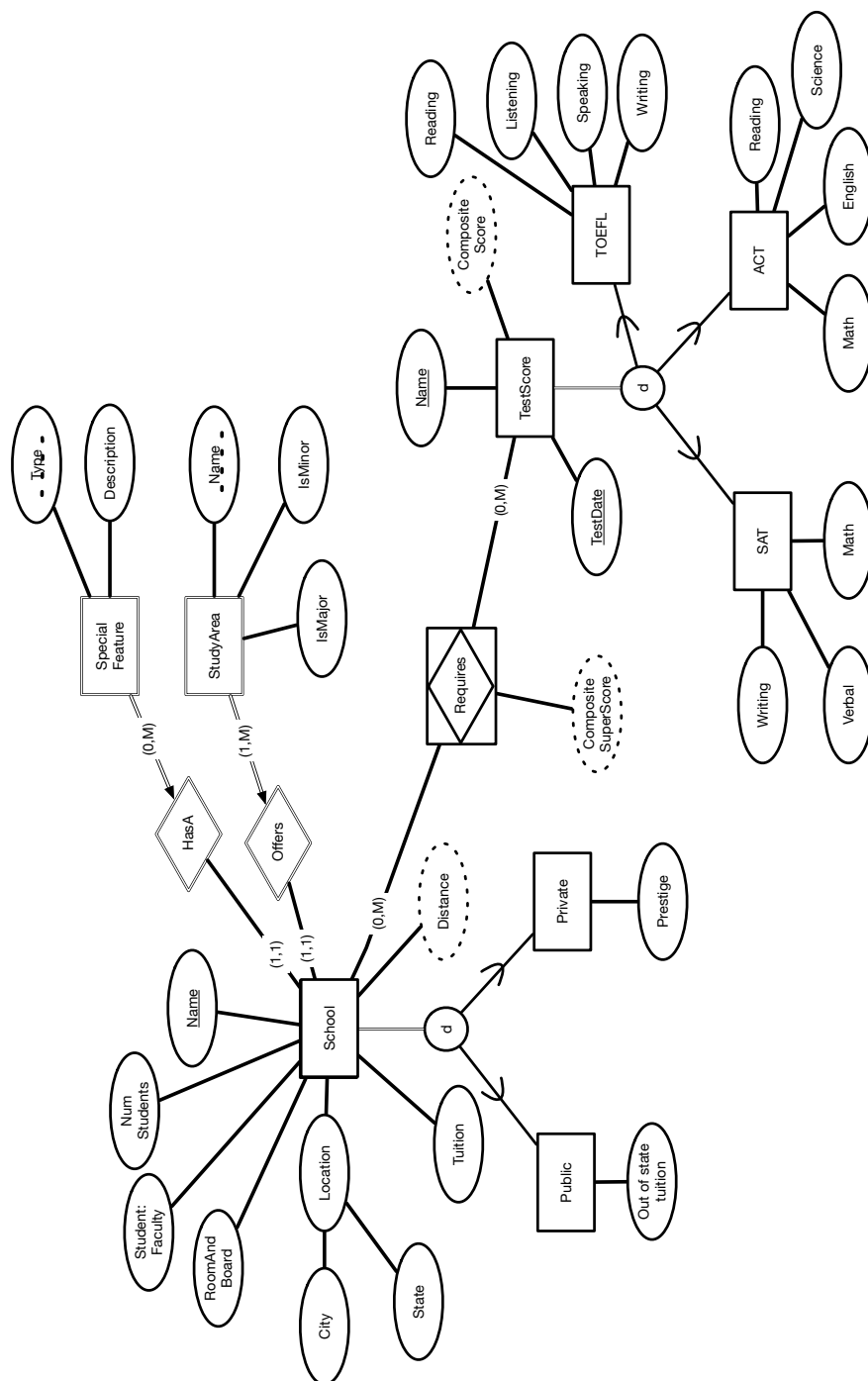
A high school junior needs to decide which colleges and universities to apply to.

Each school under consideration has a unique name and has a location that includes city and state. From that information, we compute the distance the school is from home. Each school has an annual tuition, estimated room and board, number of students, and student to faculty ratio. Schools may be public or private. Public schools have an out-of-state tuition value as well. Private schools have a "prestige" score.

The school optionally accepts scores from one or more standardized tests. There are three types of standardized tests: SAT, ACT, and TOEFL. The SAT has three scored components: Math, Writing and Verbal. The ACT has 4: Math, English, Reading, and Science. The TOEFL has 4: Reading, Listening, Speaking, and Writing. Each submitted score has a test date when it was taken and a computed composite super score (a composite super score, is the sum of each component over all times that particular test is taken, using only the best score ever for each component). Each test score has the name of the test and a computed composite score.

Each school offers a number of study areas. Each study area has a unique name within a particular school and may be a major or a minor (or both). Schools also have "Special Features" that make them unique. For example, a school might have a Mock Courtroom or no swimming pool. These features have a type and description.

There are many possible Entity-Relation Diagrams that match the text. One possible solution is below.



## 2 Convert ER Diagram

### Question 2: ERD transformation

(50 points)

Convert the following ER model into a set of relations of the format `RELNAME(Att1,Att2,Att3,...)`. Be sure to indicate the primary and foreign keys. You may indicate foreign key relations using the syntax `Attr1Name(FK:relName.attName)`



There are

- 16 relations
- 8 primary keys
- 16 foreign keys
- 10 attributes

Each item is worth 1 point.

## 2.1 Relations

Patient(MRN, Name, DOB, Gender)

SignalType(Name, MinValue, MaxValue)

Signal(MRN, Name, Start, End)

Crisis(Name, Threshold, Duration)

CrisisAssignment(CrisisName, SignalTypeName)

Epoch(MRN, Name, SignalStart, Start, End, NumPoints)

Outcome(MRN, Name, SignalStart, Start, End, CrisisName, OutcomeValue, LookAhead)

RTD(MRN, Name, SignalStart, Timestamp, Value)

## 2.2 Foreign Keys

Signal.MRN(FK: Patient.MRN)

Signal.Name(FK: SignalType.Name)

CrisisAssignment.CrisisName(FK: Crisis.Name)

CrisisAssignment.SignalTypeName(FK: SignalType.Name)

Epoch.MRN(FK: Signal.MRN)

Epoch.Name(FK: Signal.Name)

Epoch.SignalStart(FK: Signal.Start)

RealTimeData.MRN(FK: Signal.MRN)

RealTimeData.Name(FK: Signal.Name)

RealTimeData.SignalStart(FK: Signal.Start)

Outcome.MRN(FK: Epoch.MRN)

Outcome.Name(FK: Epoch.Name)

Outcome.SignalStart(FK: Epoch.SignalStart)

Outcome.EPOCHStart(FK: Epoch.Start)

Outcome.EPOCHEnd(FK: Epoch.End)

Outcome.CrisisName(FK: Crisis.Name)