Jin Lin
001233219
Section 5/6
MS in Information Systems

INFO 6210 Data Management and Database Design

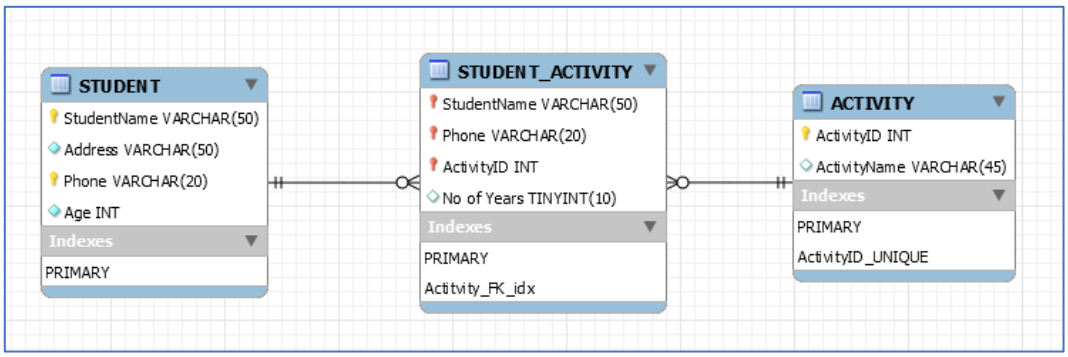
Assignment 1

Problems and Exercises:

4.

	City A	City B	Can't Tell
a. Which city maintains data about only those volunteers who currently assist agencies?			√
b. In which city would it be possible for a volunteer to assist more than one agency?	√		
c. In which city would it be possible for a volunteer to change which agency or agencies he or she assists?	√		

5.



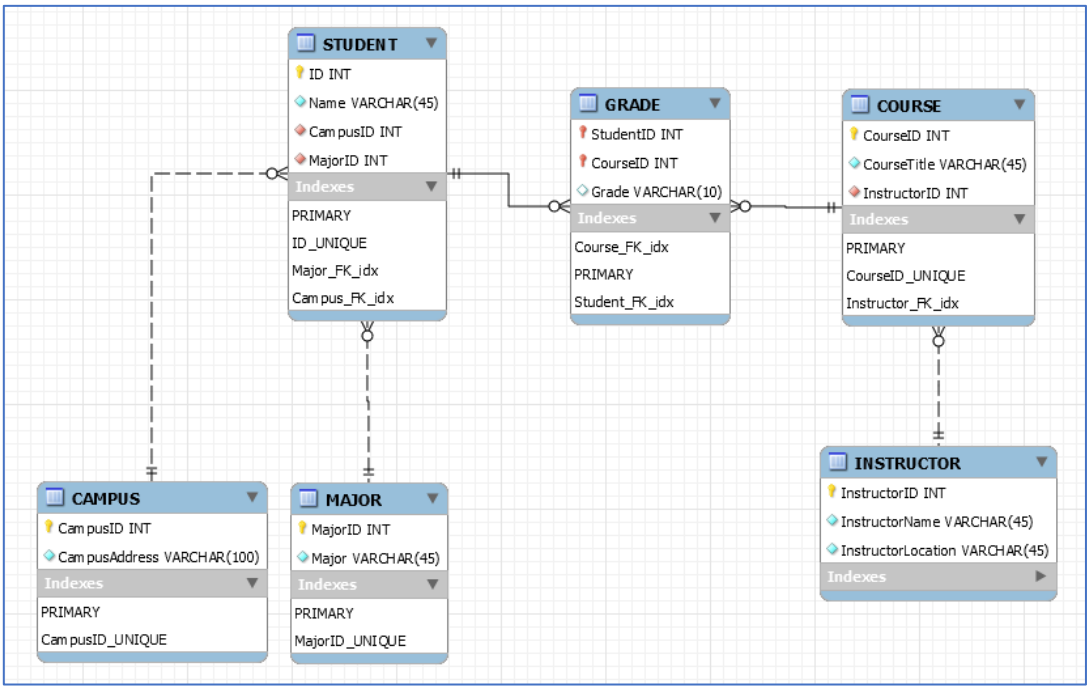
The attributes StudentName and Phone could be designated as the identifier for the entity STUDENT. Since students might have the same names, StudentName cannot uniquely identify a student. Besides, students have unique phone number, so StudentName and Phone could be the identifier.

6. Associate entities might be or might not be weak entities. It depends on whether there is an identifier uniquely identify a row in associate entities. If an associate entity is a weak entity, it

could return more than one rows when selecting associate data from associate entity, as the associate entity associates upon one or more entities and cannot uniquely identify each row.

7. Associate entities: DOES BUSINESS IN, USES, ORDER, PRODUCED IN, SUPPLIES, HAS SKILL, WORKS IN, EMPLOYEE. There are many associate entities because there are many many-to-many or one-to-many relationships.

8.



Entity(Identifier):

Student (ID), Major(MajorID), Campus(CampusID), Grade(StudentID, CourseID), Course(CourseID), Instructor(InstructorID)

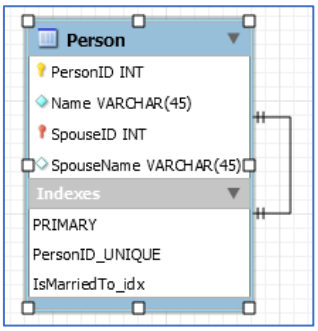
9. a. <Employee> <zero> <Carries> <many> <Dependent>
   b. <Employee> <zero> <Completes> <many> <Course>
   <Course> <zero> <Completed by> <many> <Employee>
   c. <Employee> <zero> <Has> <many> <Certificate>
   <Certificate > <one> <Had by> <one> <Employee>
   <Course> <zero> <Has> <many> <Certificate>
   <Certificate> <one> <Had by> <one> <Course>
   d. (a) <Person> <one> <Is Married To> <one> <Person>
   <Employee> <one> <Manages> <many> <Employee>
   <Team> <one> <Stands After> <one> <Team>
   (b) <Employee> <one> <Is Assigned> <one> <Parking Space>
   <Product Line> <one> <Contains> <many> <Product>

<Student> <zero> <Registers For> <many> < Course>
< Course > < many > <Registers For> < zero > < Student >

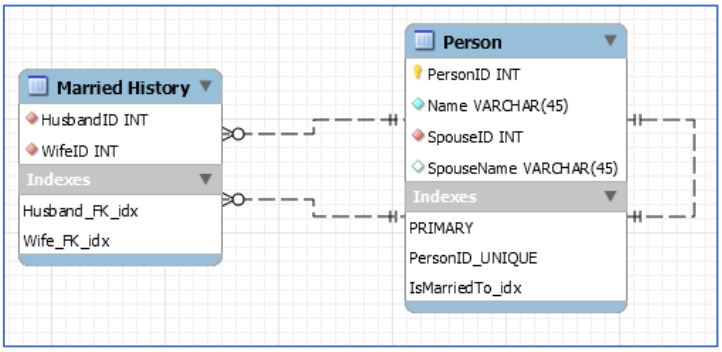
e. <Item> <zero> <Has Components> <many> < Bom Structure>
<Item> <zero> <Used in Assemblies> <many> < Bom Structure>

f. <Part> <zero> <Has > <many> <Supply Schedule>
<Vendor> <zero> <Has > <many> <Supply Schedule>
<Warehouse> <zero> <Has > <many> <Supply Schedule>

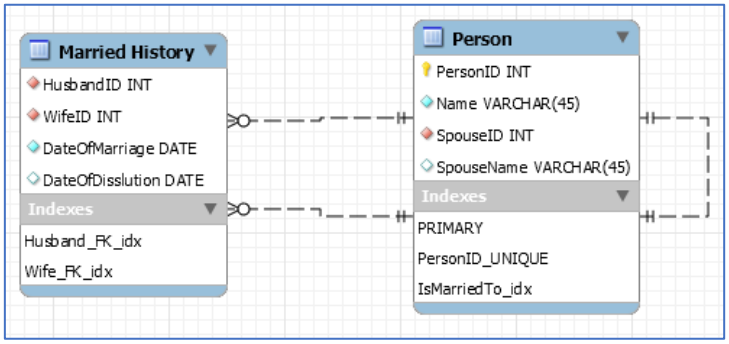
10. a.



b.



c.



d & e. the same as c.

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Assignment 2

Reviewed Questions

1. a) supertype: a general entity type
   b) subtype: a specialized entity type
   c) specialization: a mental procedure that develops subtype relationships
   d) entity cluster: a set of one or more entity types and associated relationship grouped into a single abstract entity type
   e) completeness constraint: a constraint that determines whether a supertype can have its own member or the member must be of a subtype
   f) EER model: a basic ER model plus supertype/subtype relationships
   g) subtype discriminator: an attribute of a supertype which determines the target of subtypes
   h) total specialization rule: each entity instance of the supertype must be a member of some subtype in the relationship
   i) generalization: a mental procedure that develops supertype relationships
   j) disjoint rule: a member of subtype cannot be a member of any other subtype
   k) overlap rule: an entity instant can simultaneously be a member of multiple subtype
   l) partial specialization rule: the instance of the supertype might not be a member of any subtype
   m) universal data model: a generic or template data model that can be reused as a starting point for a data modelling project

2. supertype → d, entity cluster → f, subtype → a, specialization → e, subtype discriminator → g attribute inheritance → c, overlap rule → b
3. a. supertype is a general entity type / a subtype is a specialized entity type
   b. generalization/specialization is a mental procedure that develops supertype/subtype relationships.
   c. disjoint rule means a member of subtype cannot be a member of any other subtype/
   overlap rule means an entity instant can simultaneously be a member of multiple subtype
   d. total specialization rule is each entity instance of the supertype must be a member of some subtype in the relationship
   partial specialization rule is the instance of the supertype might not be a member of any subtype
   e. PARTY is a generalized entity / PARTY ROLE is an associated entity.
   f. entity cluster is a set of one or more entity types and associated relationship grouped into a single abstract entity type
4. a. There are attributes that apply to some (but not all) instances of an entity.
   b. The instances of a subtype participate in a relationship unique to the supertype.
5. Entity cluster is used to redesign and perform more easily and concisely. Also, it omits some details and can be viewed as an entity.

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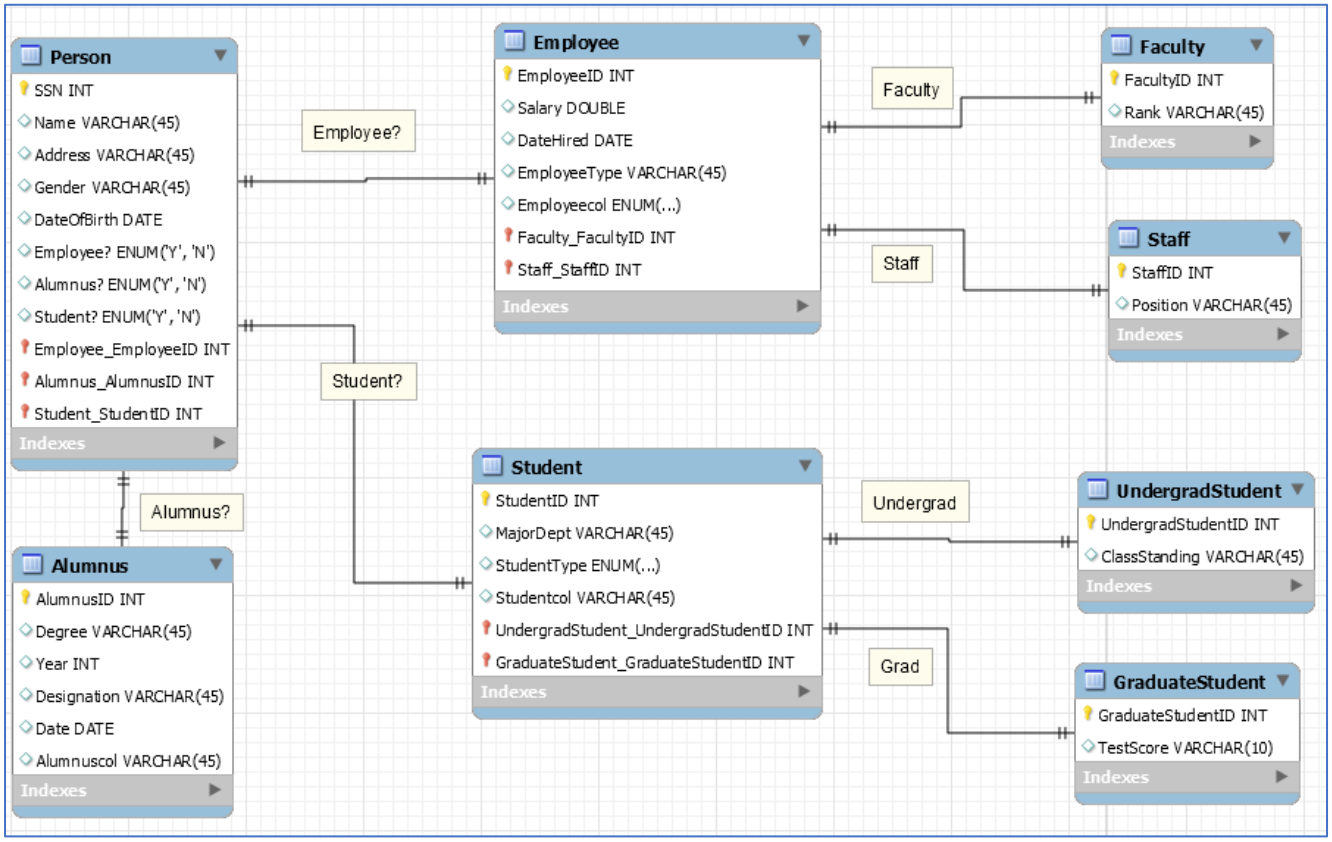
Assignment 3

Problems and Exercises

1. Graduate

SSN:	Null
Name:	Jin Lin
Address:	Boston, MA
Gender:	Male
Date Of Birth:	Nov/15/1992
Major Dept:	Information Systems Program
Test Score:	A

2.



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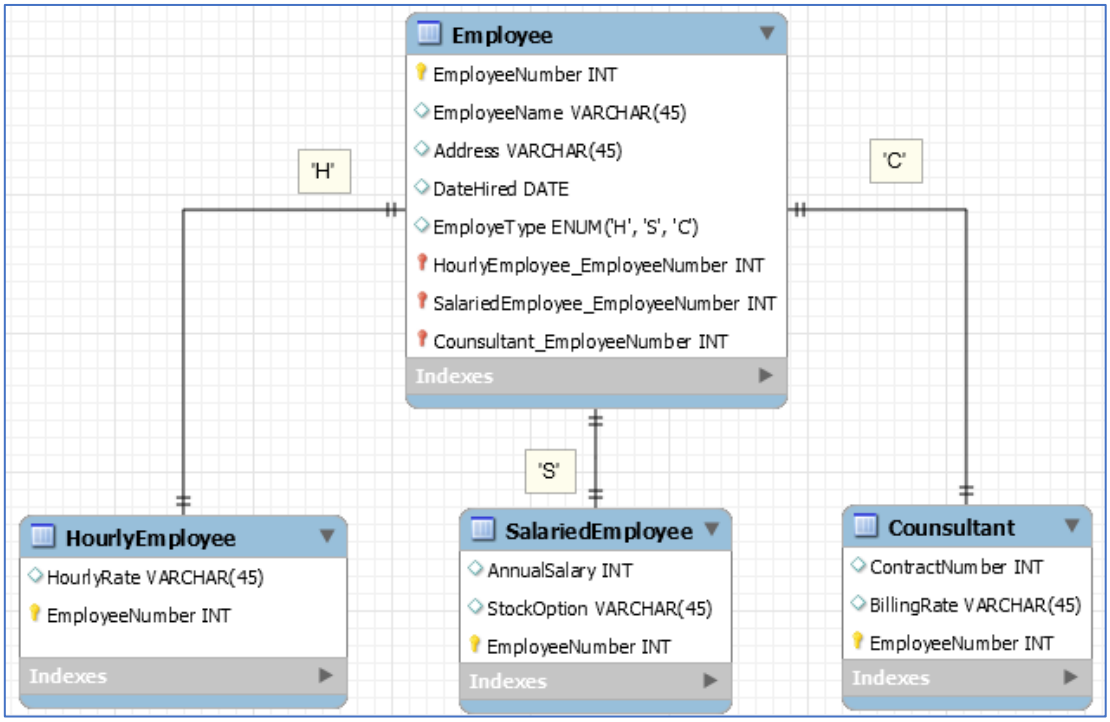
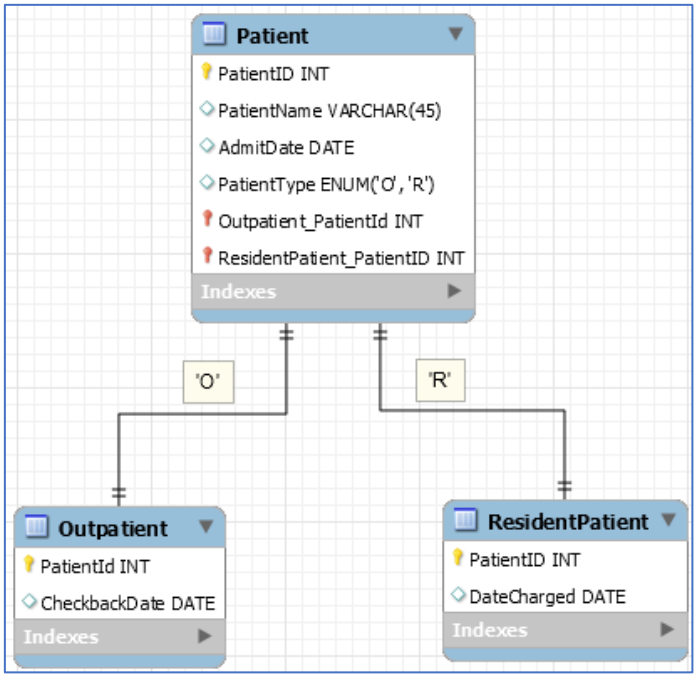
3.

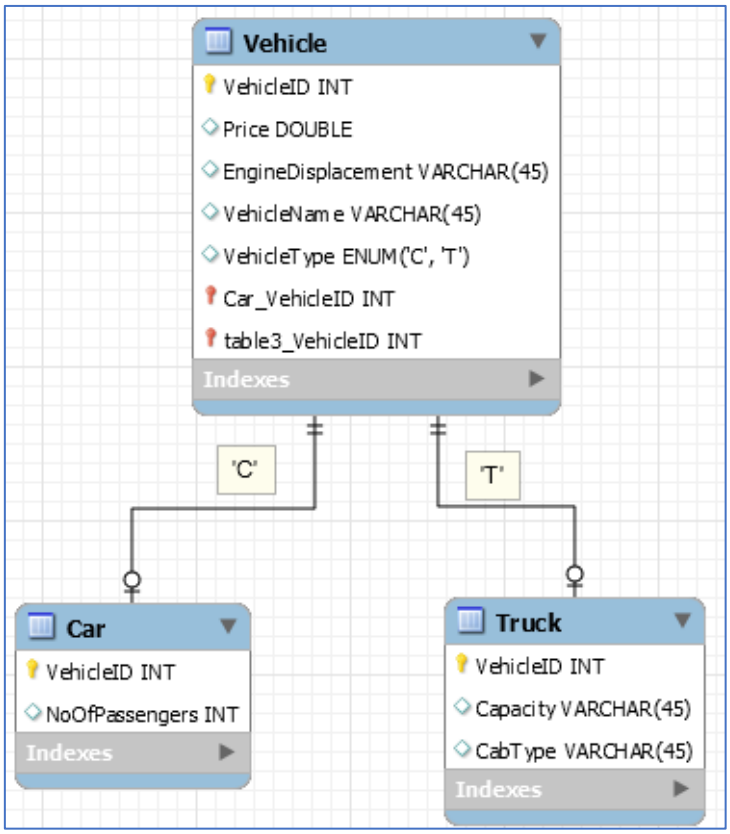
a.



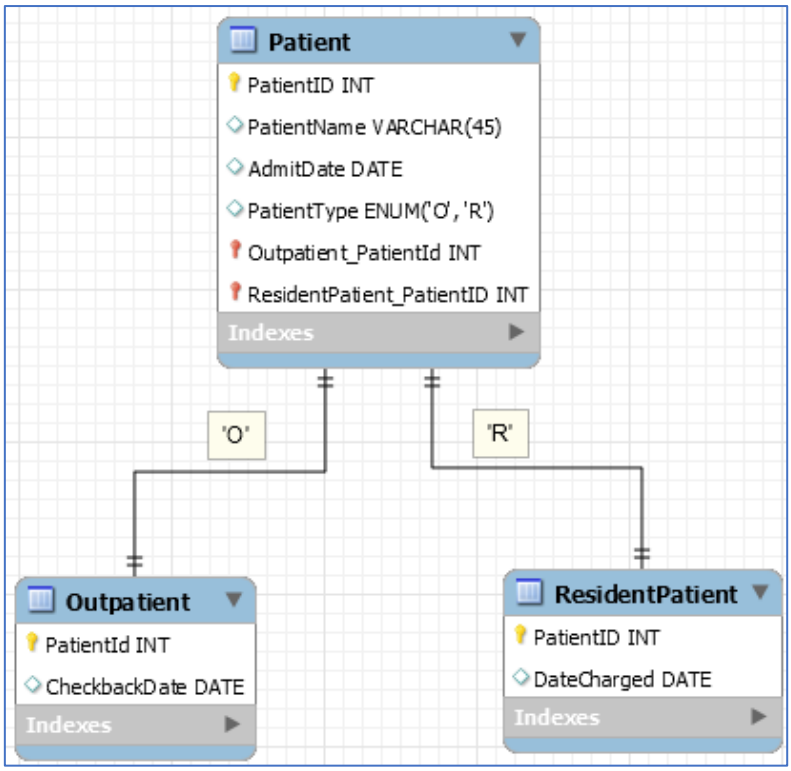
b.



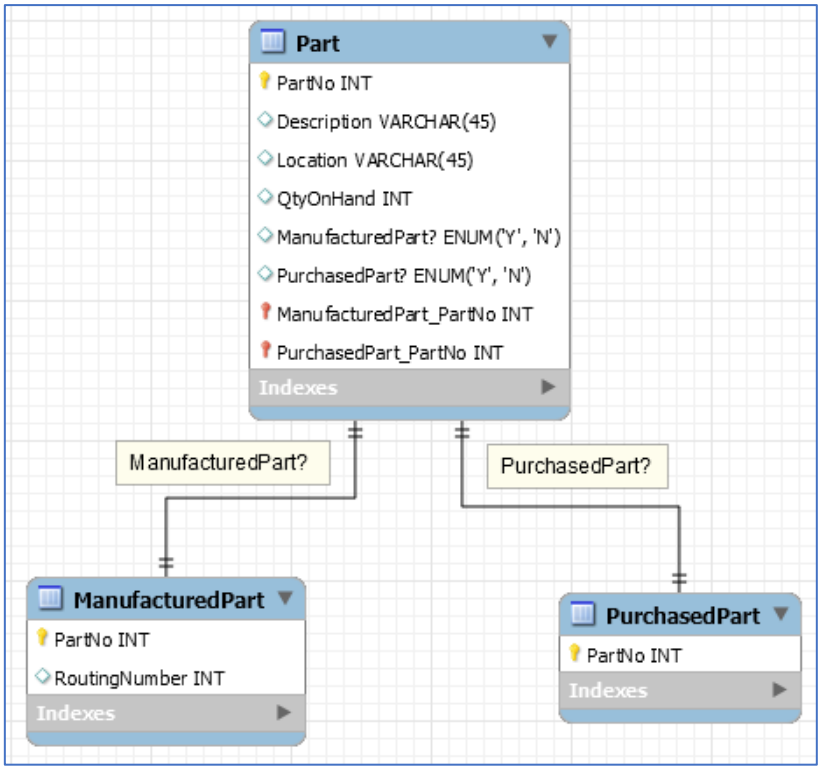
c.


Vehicle
VehicleID INT
Price DOUBLE
EngineDisplacement VARCHAR(45)
VehicleName VARCHAR(45)
VehicleType ENUM('C', 'T')
Car_VehicleID INT
table3_VehicleID INT
Indexes
'C'
'T'
Car
VehicleID INT
NoOfPassengers INT
Indexes
Truck
VehicleID INT
Capacity VARCHAR(45)
CabType VARCHAR(45)
Indexes

d.


Patient
PatientID INT
PatientName VARCHAR(45)
AdmitDate DATE
PatientType ENUM('O', 'R')
Outpatient_PatientId INT
ResidentPatient_PatientID INT
Indexes
'O'
'R'
Outpatient
PatientId INT
CheckbackDate DATE
Indexes
ResidentPatient
PatientID INT
DateCharged DATE
Indexes

e.



4.

a. HourlyEmployee (EmployeeNumber=101, EmployeeName = ‘Alice’, Address = ‘Allston, MA’, DateHired = ‘2013/03/06’, HourlyRate = 15)

b. SalariedEmployee(EmployeeNumber=102, EmployeeName = ‘Bob’, Address = ‘Boston, MA’, DateHired = ‘2015/09/11’, AnnualSalary = 50000, StockOption = ‘Y’)

c. Consultant(EmployeeNumber=103, EmployeeName = ‘Candy’, Address = ‘Watertown, MA’, DateHired = ‘2008/08/08’, ContractNumber = 25, BillingRate = 1000)

5.

a. OutPatient (PatientID = 2326, PatientName = ‘Dave’, AdmitDate = ‘2012/12/23’, CheckbackDate = ‘2013/3/23’)

b. ResidentPatient (PatientID = 2641, PatientName = ‘Elice’, AdmitDate = ‘2014/09/01’, DateDischarged = ‘2014/09/20’)

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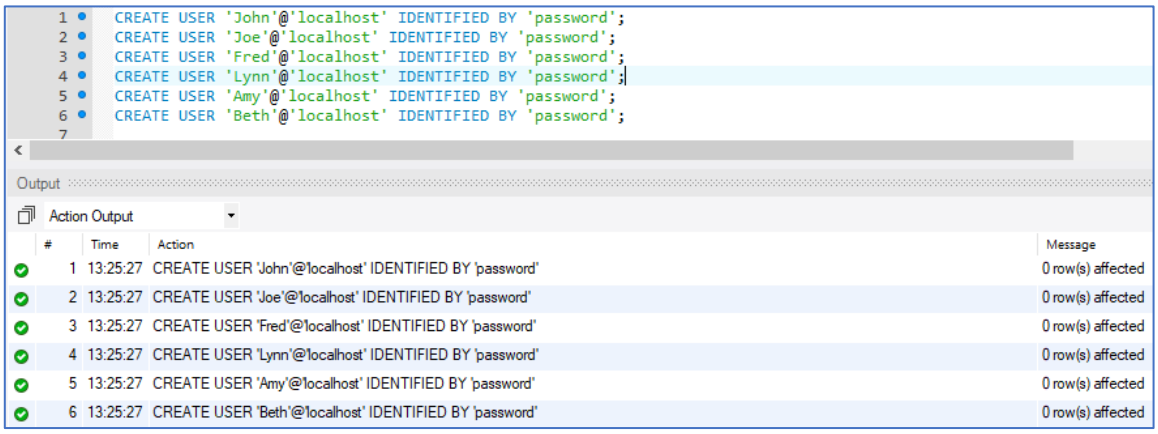
Assignment 4

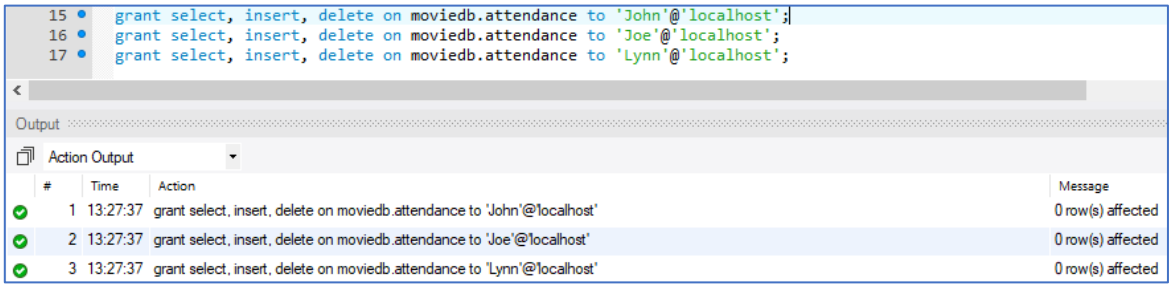
Chapter 12

MySQL version 5.7 does not support adding roles or groups. Stored procedures, like sp_addrole, sp_addlogin and sp_adduser do not exist in MySQL version 5.7.

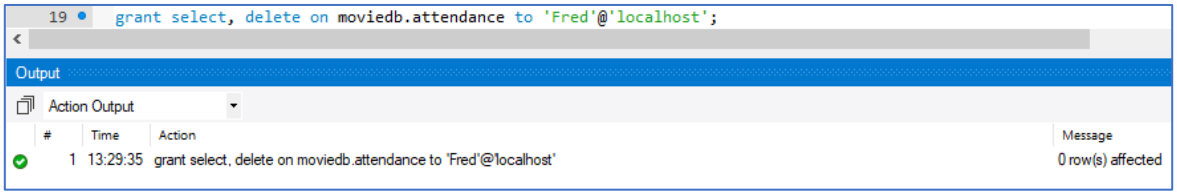
2.



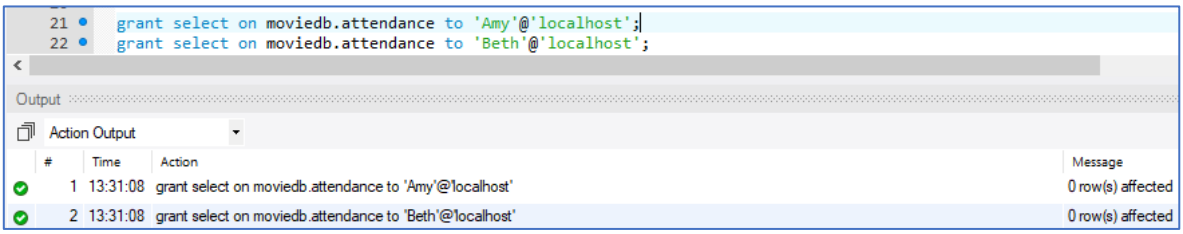
4.



5.



6.



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Assignment 5

Chapter 13

1.

```
create index Ind_Name on memberdetails(FirstName,LastName);
```

Output

Action Output

#	Time	Action
1	16:00:24	create index Ind_Name on memberdetails(FirstName,LastName)

2.

```
create index Ind_State ON MemberDetails (State);
```

Output

Action Output

#	Time	Action	Message
1	16:02:33	create index Ind_State ON MemberDetails (State)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

3.

```
create unique index Ind_Member ON MemberDetails (MemberID);
```

Output

Action Output

#	Time	Action	Message
1	16:03:33	create unique index Ind_Member ON MemberDetails (MemberID)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

4.

```
drop index ind_State on memberdetails;
drop index ind_Name on memberdetails;
drop index ind_member on memberdetails;
```

Output

Action Output

#	Time	Action	Message
1	16:07:40	drop index ind_State on memberdetails	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0
2	16:07:40	drop index ind_Name on memberdetails	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0
3	16:07:40	drop index ind_member on memberdetails	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

5.

```
CREATE INDEX IND_Name ON MemberDetails (FirstName, LastName);
CREATE INDEX IND_State ON MemberDetails (State);
CREATE UNIQUE INDEX IND_MemberId ON MemberDetails (MemberId);
```

Output

Action Output

#	Time	Action	Message
1	16:08:34	CREATE INDEX IND_Name ON MemberDetails (FirstName, L...	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0
2	16:08:34	CREATE INDEX IND_State ON MemberDetails (State)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0
3	16:08:34	CREATE UNIQUE INDEX IND_MemberId ON MemberDetails (...	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

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Assignment 6

1. Course Entity

Field	Required?	Data Type	Domain
Course ID	Yes	Integer	Primary Key, Unique
Course Name	Yes	String	
Description	Yes	Sting	
Trainer	Yes	Reference	Foreign key to the Employee table
Price	Yes	Double	>0
Date	Yes	Date	List of Dates
Time	Yes	Time	Respective times for each date
Location	Yes	String	Specific location to the course
Animal Type	Yes	Enumerate	Foreign key to the Animal table
Course Capacity	Yes	Integer	>0
Student	No	Reference	Foreign key to the Customer table, list of students

2. Employee Entity

Field	Required?	Data Type	Domain
Employee ID	No	Integer	Primary Key, Unique, Auto Increment
Last Name	Yes	String	
First Name	Yes	String	
Street	Yes	String	
City	Yes	String	
State	Yes	Reference	Foreign key to State table
Zip Code	Yes	String	Valid Zip Code
SSN	Yes	String	Valid SSN
Skills	No	Reference	Foreign key to Skills table
Phone Number1	Yes	String	Valid 10-digit phone number
Phone Number2	No	String	Valid 10-digit phone number

3. Shift Entity

Field	Required?	Data Type	Domain
Employee	Yes	Reference	Foreign key to the Employee table
Date	Yes	Date	Valid dates
Start Time	Yes	Time	>= opening time
Stop Time	Yes	Time	<= closed time

4. Customer Entity

Field	Required?	Data Type	Domain
Customer ID	No	Integer	Primary Key, Unique, Auto Increment
Last Name	Yes	String	
First Name	Yes	String	
Street	Yes	String	
City	Yes	String	
State	Yes	Reference	Foreign key to State table
Zip Code	Yes	String	Valid Zip Code
Email	Yes	String	Valid Email address
Phone Number1	Yes	String	Valid 10-digit phone number
Phone Number2	No	String	Valid 10-digit phone number
Pet	Yes	Reference	Foreign key to the Animal table
Course	No	Reference	Foreign key to the Course table

5. Time Entry Entity

Field	Required?	Data Type	Domain
Employee	Yes	Reference	Foreign key to the Employee table
Date	Yes	Date	Valid dates
Start Time	Yes	Time	>= shop opening time, <= Now
Stop Time	Yes	Time	<= shop closed time, <=Now
Paid Date	No	Date	<= Now

6. Vendor Entity

Field	Required?	Data Type	Domain
Company ID	Yes	String	Valid Company ID, Primary Key
Company Name	Yes	String	
Principal	Yes	String	Principal full name
Street	Yes	String	
City	Yes	String	
State	Yes	Reference	Foreign key to State table
Zip Code	Yes	String	Valid Zip Code
Email	Yes	String	Valid Email address
Phone Number1	Yes	String	Valid 10-digit phone number
Phone Number2	No	String	Valid 10-digit phone number
Notes	No	String	