ASSIGNMENT 1

Data Management and Business Intelligence

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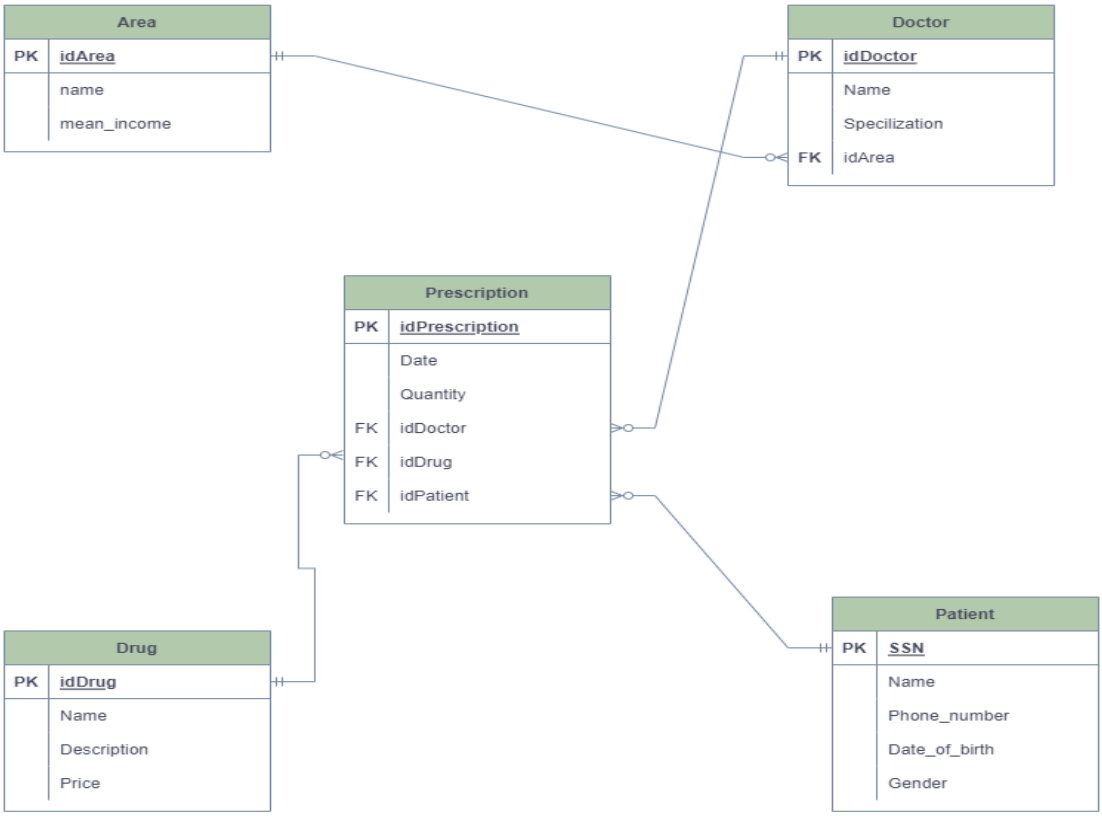
Question 1


Area
PK idArea
name
mean_income
Doctor
PK idDoctor
Name
Specilization
FK idArea
Prescription
PK idPrescription
Date
Quantity
FK idDoctor
FK idDrug
FK idPatient
Drug
PK idDrug
Name
Description
Price
Patient
PK SSN
Name
Phone_number
Date_of_birth
Gender

Question 2

```
CREATE DATABASE  IF NOT EXISTS `medical_prescriptions`

USE `medical_prescriptions`;


DROP TABLE IF EXISTS `area`;

CREATE TABLE `area` (

 `idArea` int NOT NULL AUTO_INCREMENT,

 `name` varchar(45) DEFAULT NULL,

 `mean_income` float DEFAULT NULL,

 PRIMARY KEY (`idArea`)

) ;


DROP TABLE IF EXISTS `doctor`;

CREATE TABLE `doctor` (

 `idDoctor` int NOT NULL AUTO_INCREMENT,

 `Name` varchar(45) DEFAULT NULL,

 `specialization` varchar(45) DEFAULT NULL,

 `idArea` int DEFAULT NULL,

 PRIMARY KEY (`idDoctor`),

 KEY `idArea` (`idArea`),

 CONSTRAINT `doctor_ibfk_1` FOREIGN KEY (`idArea`) REFERENCES `area` (`idArea`)

) ;


DROP TABLE IF EXISTS `drug`;

CREATE TABLE `drug` (

 `iddrug` int NOT NULL AUTO_INCREMENT,

 `name` varchar(45) DEFAULT NULL,

 `description` varchar(200) DEFAULT NULL,

 `price` float DEFAULT NULL,
```

```
  PRIMARY KEY (`iddrug`)
);

DROP TABLE IF EXISTS `patient`;
CREATE TABLE `patient` (
  `SSN` int NOT NULL,
  `name` text,
  `phone_number` bigint DEFAULT NULL,
  `date_of_birth` date DEFAULT NULL,
  `gender` text,
  PRIMARY KEY (`SSN`)
);

DROP TABLE IF EXISTS `prescription`;
CREATE TABLE `prescription` (
  `idPrescription` int NOT NULL AUTO_INCREMENT,
  `Date` datetime DEFAULT NULL,
  `Quantity` int DEFAULT NULL,
  `idDoctor` int DEFAULT NULL,
  `iddrug` int DEFAULT NULL,
  `idpatient` int DEFAULT NULL,
  PRIMARY KEY (`idPrescription`),
  KEY `idDoctor` (`idDoctor`),
  KEY `iddrug` (`iddrug`),
  KEY `idpatient` (`idpatient`),
  CONSTRAINT `prescription_ibfk_1` FOREIGN KEY (`idDoctor`) REFERENCES `doctor` (`idDoctor`),
  CONSTRAINT `prescription_ibfk_3` FOREIGN KEY (`iddrug`) REFERENCES `drug` (`iddrug`),
  CONSTRAINT `prescription_ibfk_4` FOREIGN KEY (`idpatient`) REFERENCES `patient` (`SSN`)
) ;
```

Question 3

```
#a
select distinct pat.SSN, pat.`name`
from medical_prescriptions.patient pat
   inner join (select idpatient,`Date` from medical_prescriptions.prescription) pre
   ON pat.SSN = pre.idpatient
where gender='M' and timestampdiff(year,pat.date_of_birth,curdate()) >30
and year(Date)=2021;


#b
select distinct SSN
from patient pat
where gender='F' and SSN in (select idpatient
   from prescription as P
      left join (select iddrug, price from drug) D on D.iddrug=P.iddrug
      where year(`date`)=2021
   group by  idpatient
   having  sum(quantity*price) >1000);


#c
select a.idArea,a.`name`, round(sum(dr.price*p.Quantity),2) as 'Total amount of drugs prescribed'
from area a
   left join doctor d
   on a.idArea=d.idArea
      left join (select idDoctor,quantity,iddrug from prescription) p
      on d.idDoctor=p.idDoctor
```

```
        left join (select iddrug,price from drug) dr
        on p.iddrug=dr.iddrug
group by a.idArea,a.`name`;

#d
select P.iddrug, month(P.`Date`) as 'Month', round(sum(Quantity*price),2)  as 'Total Amount'
from prescription as P
   left join (select iddrug,price from drug) D on P.iddrug=D.iddrug
where year(P.`Date`)=2021
group by P.iddrug, month(P.`Date`)
order by P.iddrug, month(P.`Date`);

#e
select D.idDoctor,D.`Name`,round(sum(Quantity*price),2)  as 'Total Amount'
from doctor as D
   left join (select idArea, mean_income from area) A on D.idArea=A.idArea
      left join (select idDoctor,  Quantity, iddrug from prescription) P on D.idDoctor=P.idDoctor
         left join (select iddrug, price from drug) as DR on P.iddrug=DR.iddrug
where mean_income between 20000 and 30000
group by D.idDoctor,D.`Name`
order by D.idDoctor;

#f
select specialization, count(idPrescription) as 'Total Number of Prescriptions'
from doctor as D
   left join (select idPrescription,idDoctor,`Date`,iddrug from prescription) P
   on D.idDoctor=P.idDoctor
      left join (select iddrug from drug) DR
      on P.iddrug=DR.iddrug
```

```
where year(P.`Date`)=2021
group by specialization;


#g
with  year_2020 as(
   select  P.iddrug as 'iddrug',  year(P.`Date`) as 'year' ,round(sum(Quantity*price),2) as 'Y1_total'
   from  prescription as P
      left join (select iddrug, price from drug) D on P.iddrug=D.iddrug
   where year(P.`Date`)=2020
   group by  P.iddrug,year(P.`Date`)
   order by P.iddrug,year(P.`Date`)),
    year_2021 as(
   select  P.iddrug as 'iddrug',  year(P.`Date`) as 'year' ,round(sum(Quantity*price),2) as 'Y2_total'
   from  prescription as P
      left join (select iddrug, price from drug) D on P.iddrug=D.iddrug
   where year(P.`Date`)=2021
   group by  P.iddrug,year(P.`Date`)
   order by P.iddrug,year(P.`Date`))

select Y1.iddrug, ROUND((Y2_total-Y1_total)/Y1_total,2)*100 AS 'Percentage change %'
from year_2020 as Y1
   join year_2021  as Y2
   on Y1.iddrug=Y2.iddrug;


#h
select D.iddrug, sum( case when  gender='F' then  round(((Quantity*price)),2) else 0 end) AS 'F',
sum( case when  gender='M' then  round(((Quantity*price)),2) else 0 end) as 'M'
from patient as PA
   left join (select idpatient, Quantity,iddrug, `Date` from prescription) P
```

```
    on PA.SSN=P.idpatient
      left join (select iddrug,price from drug) D
      on P.iddrug=D.iddrug
    where year(P.`Date`) =2021
group by  D.iddrug
order by  D.iddrug;
```

Question 4

```
import mysql.connector


import mysql.connector
from mysql.connector import Error


try:
   connection = mysql.connector.connect(host='localhost',
                                        database='medical_prescriptions',
                                        user='root',
                                        password='******')


   cursor = connection.cursor()
   cursor.execute("select pre.idPrescription,date(pre.`Date`),time(pre.`Date`),p.`Name`,p.phone_number,d.`Name`,d.specialization,dr.`name`,dr.price,pre.Quantity From prescription pre  left join  patient p on pre.idpatient=p.SSN  left join doctor d on pre.idDoctor=d.idDoctor left join drug dr on pre.iddrug=dr.iddrug")
   record = cursor.fetchall()
   for row in record:
      print("IdPrescription = ", row[0], )
      print("Date = ", row[1])
      print("Time = ", row[2])
      print("Patient Name  = ", row[3])
      print("Phone Number  = ", row[4])
      print("Doctor Name   = ", row[5])
      print("Specilization  = ", row[6])
      print("Drug Name  = ", row[7])
      print("Price  = ", row[8])
      print("Quantity  = ", row[9], "\n")
```

```
except Error as e:
    print("Error while connecting to MySQL", e)
finally:
    if connection.is_connected():
        cursor.close()
        connection.close()
        print("MySQL connection is closed")
```