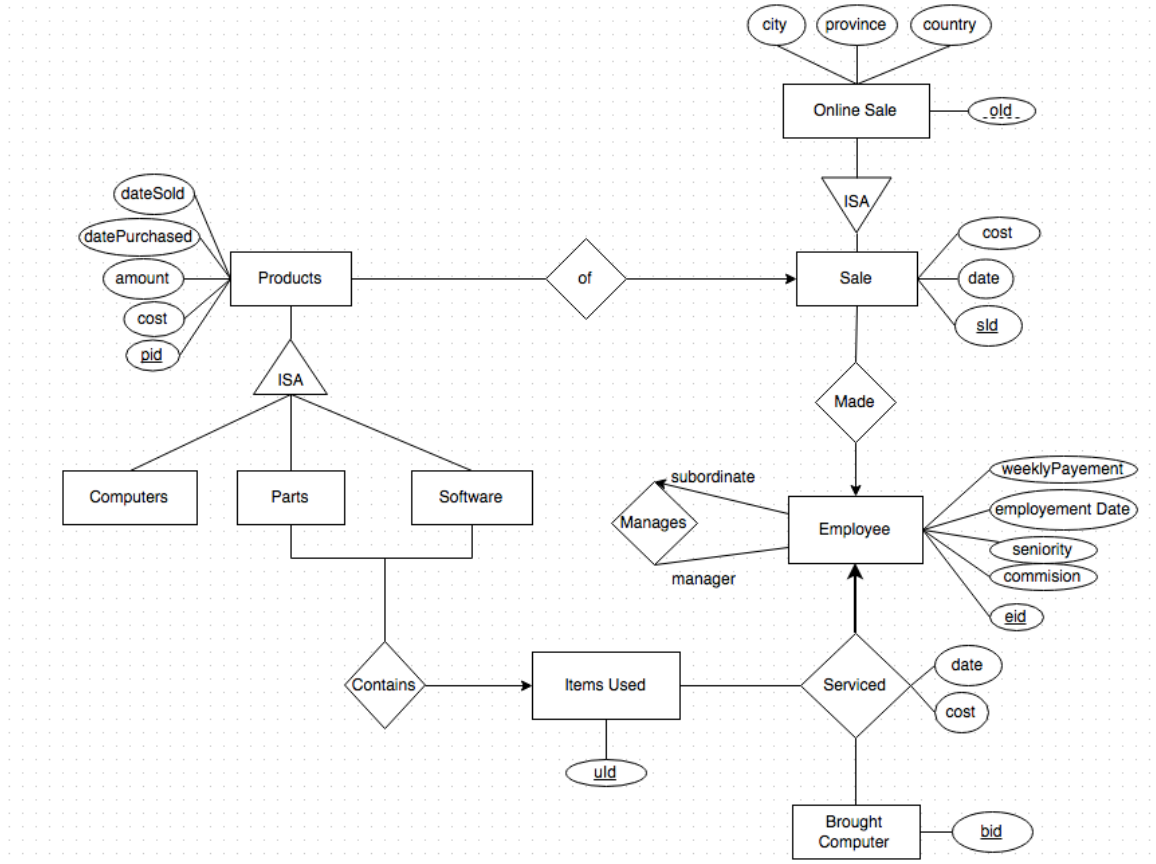


Question 1:



Employee(eid, weeklyPayment, employmentDate, seniority, commission)

Sale(sid, date, cost)

OnlineSale(sid, oid, date, cost, city, province, country)

ItemUsed(uId)

Products(pid, amount, cost, datePurchased, dateSold)

BroughtComputer(bid)

Manages(eid, eid)

Made(eid, sid)

Serviced(eid, bid, uId, date, cost)

Contains(uId, pid)

Of(sid, pid)

Question 2:

Department (did, deptName, administrator, numberOfBeds)

Employee (MedicareNumber, did, firstName, lastName, jobTitle, startDate, endDate, gender, dateOfBirth, phone#, email, address)

Patient (medicareNumber, firstName, lastName, gender, dateOfBirth, phone#, address*)

Admission (date, MedicareNumber, DoctorId, reasonForAdmission, dateAdmitted, dateDischarged)

Visit (time, date, MedicareNumber, DoctorId, diagnosis, medicalReport)

Doctor (MedicareNumber, DoctorId, specialty, visitFee)

Nurse (MedicareNumber, NurseId, specialty)

1. List the information of all doctors who are specialized in heart surgery.

$\sigma_{\text{Specialty} = \text{heart surgery}}(\text{Employees} \bowtie \text{Doctors})$

2. List the information of all nurses who are from Laval and started since June 01, 2012.

$\sigma_{\text{Address} = \text{Laval} \wedge \text{startDate} > \text{June 01 2012}}(\text{Employees} \bowtie \text{Nurses})$

3. Given a patient's Medicare number, list the Medical Report of that patient.

$\Pi_{\text{medicalReports}}(\sigma_{\text{medicareNumber} = \text{query}}(\text{Visit}))$

4. Given a patient's Medicare number, find out how much s/he has paid for each visit since June 2014.

$\Pi_{\text{visitFee}}(\sigma_{\text{medicareNumber} = \text{query} \wedge \text{date} > \text{June 2014}}(\text{Visit} \bowtie \text{Doctor}))$

5. List heart patients who were admitted/visited at least twice.

$\rho(\text{VisitPair}, \text{Visit})$

$\rho(\text{VisitedTwice}, \sigma_{\text{VisitPair.MedicareNumber} = \text{Visit.MedicareNumber} \wedge$

$\text{Visit.diagnosis} = \text{'Heart'} \wedge$

$\text{VisitPair.time} \neq \text{Visit.time}(\text{Visit} \times \text{VisitPair}))$

$\rho(\text{AdmissionPair}, \text{Admission})$

$\rho(\text{AdmittedTwice}, \sigma_{\text{AdmissionPair.MedicareNumber} = \text{Admission.MedicareNumber} \wedge$

$\text{Admission.reasonForAdmission} = \text{'Heart'} \wedge$

$\text{AdmissionPair.dateAdmitted} \neq \text{Admission.dateAdmitted} (\text{Admission} \times$

$\text{AdmissionPair}))$

$\Pi_{\text{MedicareNumber}}(\text{VisitedTwice}) \cap \Pi_{\text{MedicareNumber}}(\text{AdmittedTwice})$

6. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients with Cancer or HIV.

$\Pi_c(\sigma_{\text{reasonForAdmission} = \text{'Cancer'} \vee \text{reasonForAdmission} = \text{'HIV'}}(\text{Admission} \bowtie \text{Patients}))$

C: firstName, lastName, phone, dateAdmitted, dateDischarged

7. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients with Cancer and HIV.

$\Pi_c(\sigma_{\text{reasonForAdmission} = \text{'Cancer'}}(\text{Admission} \bowtie \text{Patients}) \cap \sigma_{\text{reasonForAdmission} = \text{'HIV'}}(\text{Admission} \bowtie \text{Patients}))$

C: firstName, lastName, phone, dateAdmitted, dateDischarged

8. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients with Cancer but do not have HIV.

$\Pi_c(\sigma_{\text{reasonForAdmission} = \text{'Cancer'}}(\text{Admission} \bowtie \text{Patients}) - \sigma_{\text{reasonForAdmission} = \text{'HIV'}}(\text{Admission} \bowtie \text{Patients}))$

C: firstName, lastName, phone, dateAdmitted, dateDischarged

9. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients who are doctors.

$\Pi_c(\text{Admission} \bowtie \text{Patients} \bowtie \text{Doctors})$

C: firstName, lastName, phone, dateAdmitted, dateDischarged

10. List employee's first name, last name, jobTitle, phone# of employees who are patients and diagnosed with HIV.

$\Pi_c(\sigma_{\text{diagnosis} = \text{'HIV'}}(\text{Patients} \bowtie \text{Employee} \bowtie \text{Doctors}))$

C: firstName, lastName, jobTitle, phone