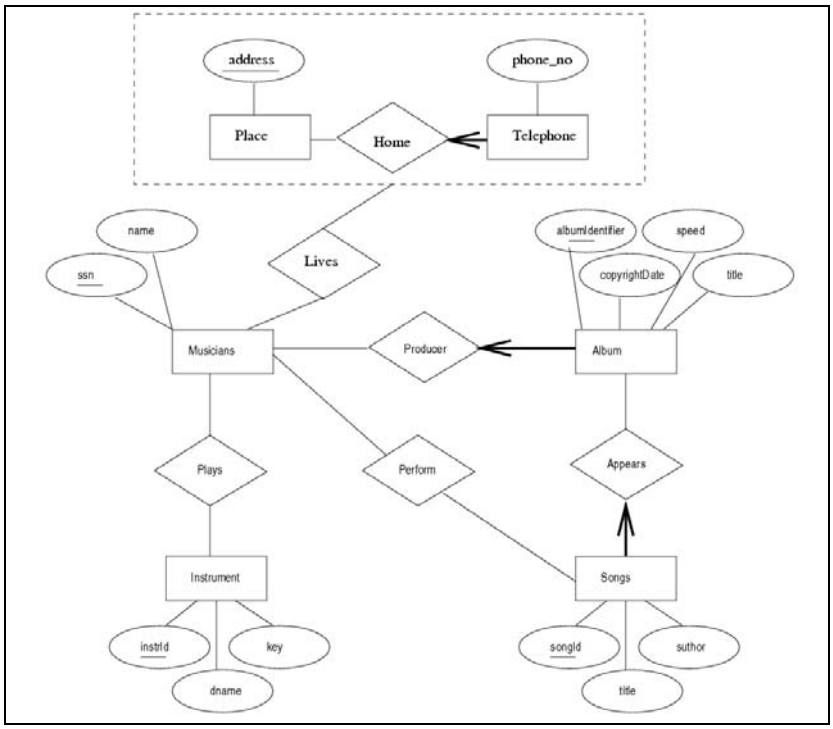
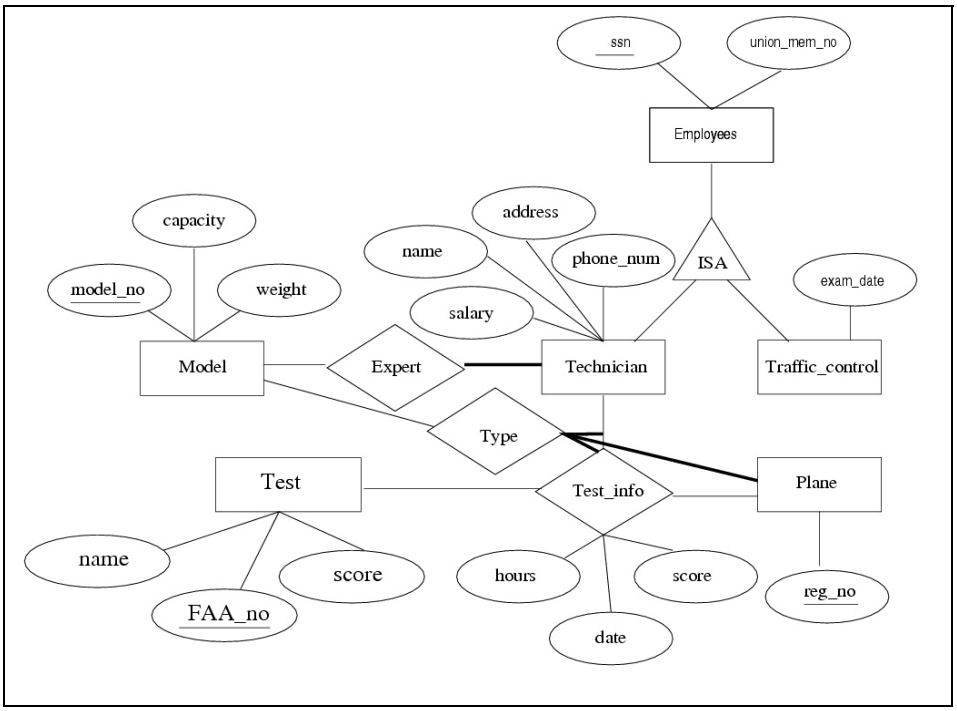
CS351 Fall 2010 Solutions of Homework #4

Exercise 2.5



Exercise 2.6



Consider the following Relational Database Schema consisting of the four Relation Schemas:

passenger (p#, pname, pcity)
agency (a#, aname, acity)
flight (f#, fdate, time, from, to)
booking (p#, a#, f#, fdate)

1. Get full details of all flights.
   (flight)

2. Get full details of all flights to İstanbul.
   $\sigma_{to="İstanbul"}$ (flight)

3. Get full details of all flights from "ANKARA" to "İSTANBUL"
   $\sigma_{from="ANKARA" \wedge to="ISTANBUL"}$ (flight)

4. Get agency numbers (a#) for agencies who made a reservation on flight TK130.
   $\pi_{a\#}(\sigma_{f\#=TK130}(\text{booking}))$

5. Get all flight numbers for passenger p# = 123 for flights to İstanbul before 01/01/2007.
   $\pi_{f\#}(\sigma_{p\#=123}(\text{booking}) \text{ |x| } \sigma_{to="İstanbul" \wedge fdate<01/01/2007}(\text{flight}))$

6. Get passenger names for passengers who have bookings on at least one flight.
   $\pi_{pname}(\text{passenger |x| booking})$

7. Get passenger names for passengers who have more than one booking.
   ρ (booking2(p#2, a#2, f#2, fdate2), booking)
   $\pi_{pname}(\text{passenger |x| } \pi_{p\#} (\text{booking |x|}_{p\#=p\#2 \wedge (a\#\neq a\#2 \vee f\#\neq f\#2 \vee fdate\neq fdate2)} \text{ booking2}))$

8. Get passenger names for passengers who do not have any bookings.
   $\pi_{pname}((\pi_{p\#}(\text{passenger}) - \pi_{p\#}(\text{booking})) \text{ |x| passenger})$

9. Get agency names for agencies who live in the same city as passenger p# = 123.
   $\pi_{aname}(\text{agency |x|}_{acity=pcity} \sigma_{p\#=123}(\text{passenger}))$

10. Get all details of flights scheduled on both dates 01/12/2010 and 02/12/2010 at 16:00.
    $\sigma_{fdate=01/12/2010 \wedge time=16:00}(\text{flight}) \cap \sigma_{fdate=02/12/2010 \wedge time=16:00}(\text{flight})$

11. Get all details of flights on either of the dates 01/12/2010 or 02/12/2010 or both at 6:00
    $\sigma_{fdate=01/12/2010 \wedge time=6:00}(\text{flight}) \cup \sigma_{fdate=02/12/2010 \wedge time=6:00}(\text{flight})$

12. Get agency names for agencies that have bookings on all flights on 10/12/2010 at 6:00.
    $\pi_{aname}(\text{agency |x| } (\pi_{a\#,f\#}(\text{booking}) / \pi_{f\#}(\sigma_{fdate=10/12/2010 \wedge time=6:00}(\text{flight})))$

13. Get agency names for agencies who do not have any bookings for passenger p# = 123.
    $\pi_{aname}(\text{agency |x| } (\pi_{a\#} (\text{agency}) - \pi_{a\#} (\sigma_{p\#=123}(\text{booking})))$

14. Get the passenger names for passengers who have at least all the bookings as the passenger with p# = 123.
    $\pi_{pname}(\text{passenger |x| } (\pi_{p\#,a\#,f\#,fdate}(\text{booking}) / \pi_{a\#,f\#,fdate}(\sigma_{p\#=123}(\text{booking})))$