

## Final – Solution

Q 1:

leaseNo	bannerID	placeNo	startDate	finishDate
10003	B017706	78	01/09/2010	30/06/2011
10259	B017706	88	01/09/2011	30/06/2012
10364	B013399	89	01/09/2011	30/06/2012
10566	B012124	102	01/09/2011	30/06/2012
11067	B034511	88	01/09/2012	30/06/2013
11169	B013399	78	01/09/2012	30/06/2013

flatNo	flat Address
F56	34 High Street, Paisley
F78	111 Storrie Road, Paisley
F79	120 Lady Lane, Paisley

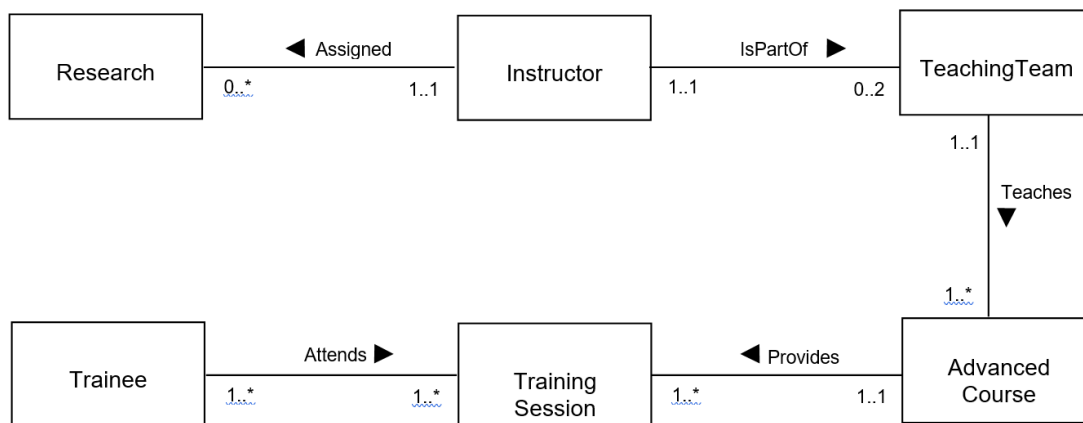
bannerID	fName	lName
B017706	Jane	Watt
B013399	Tom	Jones
B012124	Karen	Black
B034511	Steven	Smith

placeNo	flatNo
78	F56
88	F78
89	F78
102	F79

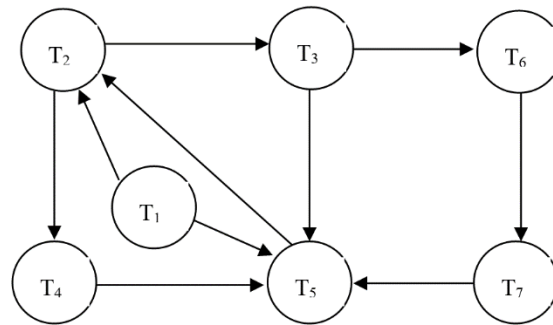
Q. 2

- $\rho_R(\text{myCount}) \text{ COUNT propertyNo } (\sigma_{\text{rent} > 350} (\text{PropertyForRent}))$
- $(\Pi_{\text{clientNo, propertyNo}}(\text{Viewing})) \div (\Pi_{\text{propertyNo}}(\sigma_{\text{rooms} = 3}(\text{PropertyForRent})))$
- $(\Pi_{\text{clientNo, fName, lName}}(\text{Client})) \bowtie_{\text{Client.clientNo} = \text{Viewing.clientNo}} (\Pi_{\text{clientNo, propertyNo, comment}}(\text{Viewing}))$
- $\Pi_{\text{city}}(\text{Branch}) \cup \Pi_{\text{city}}(\text{PropertyForRent})$
- $\Pi_{\text{city}}(\text{Branch}) - \Pi_{\text{city}}(\text{PropertyForRent})$

Q. 3



Q. 4:



Cycles in graph implies that deadlock exists.

Q 5:

Below are the 15 possible schedules, and the type of each schedule:

S 1 : R 1 (X); W 1 (X); R 1 (Y); W 1 (Y); R 2 (X); W 2 (X); serial (and hence also serializable)  
 S 2 : R 2 (X); R 1 (X); W 2 (X); W 1 (X); R 1 (Y); W 1 (Y); not (conflict) serializable  
 S 3 : R 1 (X); W 1 (X); R 1 (Y); R 2 (X); W 1 (Y); W 2 (X); (conflict) serializable  
 S 4 : R 2 (X); R 1 (X); W 1 (X); R 1 (Y); W 1 (Y); W 2 (X); not (conflict) serializable  
 S 5 : R 1 (X); W 1 (X); R 1 (Y); R 2 (X); W 2 (X); W 1 (Y); (conflict) serializable  
 S 6 : R 1 (X); W 1 (X); R 2 (X); R 1 (Y); W 2 (X); W 1 (Y); (conflict) serializable  
 S 7 : R 2 (X); R 1 (X); W 1 (X); R 1 (Y); W 2 (X); W 1 (Y); not (conflict) serializable  
 S 8 : R 1 (X); W 1 (X); R 2 (X); W 2 (X); R 1 (Y); W 1 (Y); (conflict) serializable  
 S 9 : R 1 (X); R 2 (X); W 1 (X); R 1 (Y); W 1 (Y); W 2 (X); not (conflict) serializable  
 S 10 : R 1 (X); R 2 (X); W 1 (X); R 1 (Y); W 2 (X); W 1 (Y); not (conflict) serializable  
 S 11 : R 1 (X); R 2 (X); W 1 (X); W 2 (X); R 1 (Y); W 1 (Y); not (conflict) serializable  
 S 12 : R 1 (X); W 1 (X); R 2 (X); R 1 (Y); W 1 (Y); W 2 (X); (conflict) serializable  
 S 13 : R 1 (X); R 2 (X); W 2 (X); W 1 (X); R 1 (Y); W 1 (Y); not (conflict) serializable  
 S 14 : R 2 (X); R 1 (X); W 1 (X); W 2 (X); R 1 (Y); W 1 (Y); not (conflict) serializable  
 S 15 : R 2 (X); W 2 (X); R 1 (X); W 1 (X); R 1 (Y); W 1 (Y); serial (and hence also serializable)

Q 6:

a. 

```
SELECT COUNT(*)
FROM Animals
WHERE Type = 'dog'
AND DateAdmitted = '18/04/2000'
```

b. 

```
SELECT Name
FROM Adopter
WHERE NOT EXISTS
(SELECT *
FROM Animals A1
WHERE NOT EXISTS
```

```
(SELECT *  
FROM Adoption, Animals A2  
WHERE AnimalID = A2.ID  
AND A2.Type = A1.Type  
AND Adoption.SIN = Adopter.SIN))
```

```
SELECT Type, COUNT(*)  
FROM Animals, Adoption  
WHERE AdoptDate = '14/06/1999'  
AND Animals.ID = Adoption.AnimalID  
GROUP BY Type;
```

c.

```
SELECT DISTINCT Type  
FROM Animals  
WHERE NOT EXISTS  
(SELECT *  
FROM Adoption  
WHERE Adoption.AnimalID = Animals.ID)
```

d.

```
SELECT Name, Address  
FROM Adopter, Adoption  
WHERE Adopter.SIN = Adoption.SIN  
GROUP BY Adoption.SIN  
HAVING COUNT(SIN) > 1;
```

e.