# Contents

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# 1  Common Solution

## 1.1  Lab 6

-- 1. Create Database
create database DreamHome
-- 2. Set My Working Database in Query Editor
use DreamHome

-- 3. Create Tables

-- Branch
create table Branch (branchNo varchar(20) NOT NULL Primary Key, street varchar(100) NOT NULL, city varchar(50) NOT NULL,
postcode varchar(20) NOT NULL);

-- Staff
create table Staff (staffNo varchar(20) NOT NULL PRIMARY KEY, fName varchar(50) NOT NULL, lName varchar(50) NOT NULL,
position varchar(50) NOT NULL, sex varchar(1) NOT NULL, DOB DateTime NOT NULL, salary DECIMAL NOT NULL,
branchNo varchar(20) NOT NULL References Branch(branchNo));

-- Client
create table Client (clientNo varchar(20) NOT NULL PRIMARY KEY, fName varchar(50) NOT NULL, lName varchar(50) NOT NULL,
telNo varchar(20) NOT NULL, prefType varchar(50) NOT NULL, maxRent DECIMAL NOT NULL)

-- PrivateOwner
create table PrivateOwner (ownerNo varchar(20) NOT NULL PRIMARY KEY, fName varchar(50) NOT NULL, lName varchar(50) NOT NULL,
[address] varchar(50) NOT NULL, telNo varchar(20) NOT NULL)

-- PropertyForRent
create table PropertyForRent (propertyNo varchar(20) NOT NULL PRIMARY KEY, street varchar(100) NOT NULL, city varchar(50) NOT NULL,
postcode varchar(20) NOT NULL, type varchar(10) NOT NULL, rooms int NOT NULL, rent DECIMAL NOT NULL,
ownerNo varchar(20) References PrivateOwner(ownerNo), staffNo varchar(20) NOT NULL References Staff(staffNo),
branchNo varchar(20) NOT NULL References Branch(branchNo));

-- Viewing
create table Viewing (clientNo varchar(20) NOT NULL References Client(clientNo),
propertyNo varchar(20) NOT NULL References PropertyForRent(propertyNo), viewDate DateTime NOT NULL,
comment varchar(200) NOT NULL)

-- Registration
create table Registration(clientNo varchar(20) NOT NULL References Client(clientNo),

branchNo varchar(20) NOT NULL References Branch(branchNo),staffNo varchar(20) NOT NULL References Staff(staffNo),dateJoined DateTime NOT NULL)


```sql
-- 4.2 Multiple Rows Example
INSERT into Branch (branchNo, street, city, postcode)
VALUES
('B001', 'H#79 I-10/2', 'ISB', '52000'),
('B002', 'H#78 Supply', 'ABT', '53000'),
('B003', 'H#79 I-10/2', 'ISB', '52000'),
('B004','H#78 Mandia', 'ABT', '53000'),
('B005','H#85 Supply', 'ABT', '53000'),
('B006','H#86 G-6', 'ISB', '52000'),
('B007','H#895 Cantt', 'ABT', '53000'),
('B008','H#55 Kalapul', 'ABT', '53000'),
('B009','H#986 Beer', 'HAR', '22620'),
('B010','H#12 Cantt', 'HAV', '22500'),
('B011','H#565 KTS', 'HAR', '22620'),
('B012','H#123 KTS', 'HAR', '22620'),
('B013','H#985 F-9', 'ISB', '52000'),
('B014','H#120 DHA', 'LHR', '54000'),
('B015','H#76 TIP', 'HAR', '22620'),
('B016','H#33 Baldher', 'HAR', '22620'),
('B017','H#22 SALHAD', 'ABT', '53000'),
('B018','H#11 HARNOI', 'ABT', '53000'),
('B019','H#13 H-9', 'ISB', '52000'),
('B020','H#99 FAIZABAD', 'RWP', '44000'),
('B021','H#164 PANIAN', 'HAR', '22620')

insert into Staff (staffNo, fName, lName, position, sex, DOB, salary, branchNo)
VALUES
('SA9', 'Mary', 'Howe', 'Assistant', 'F', '9/11/1988', 20000, 'B002'),
('SG14', 'David', 'Ford', 'Supervisor', 'M','11/9/1987', 100000, 'B003'),
('SG37', 'An', 'Beech', 'Assistant', 'F','12/8/1986', 90000, 'B003'),
('SG5', 'Susa', 'Brand', 'Manager', 'F', '5/9/1989', 120000, 'B003'),
('SL21', 'Joh', 'White', 'Manager', 'M', '2/12/1992', 100000, 'B004'),
('SL41', 'Julie', 'Lee', 'Assistant', 'F', '8/3/1990', 50000, 'B002'),
('SP98', 'Akbar', 'Shah', 'Assistant Manager', 'M', '9/8/1996', 70000, 'B005'),
('SK32', 'Mahrukh', 'Bibi', 'Customer Service', 'F', '10/4/1994', 60000, 'B010'),
('SB83', 'Ahmad', 'Hassan', 'Clerk', 'M', '4/6/1991', 40000, 'B009'),
('SR68', 'Hamid', 'Ali', 'Security Guard', 'M', '9/12/1982', 10000, 'B007'),
('SI12', 'Akhtar', 'Rasheed', 'Security Officer', 'M', '8/9/1989', 50000, 'B012'),
('SV56', 'Hajra', 'Khan', 'Customer Service', 'F', '3/4/1992', 60000, 'B006'),
('ST91', 'Maria', 'Kareem', 'Customer Service Manager', 'M', '1/7/1991', 80000, 'B008'),
('SO61', 'Kamran', 'Khan', 'Salesperson', 'M', '9/2/1987', 70000, 'B020'),
('SQ19', 'Khurshid', 'Akram', 'Finance Manager', 'M', '12/8/1982', 80000, 'B011'),
('SJ37', 'Sara', 'Majeed', 'HR Manager', 'F', '12/6/1981', 60000, 'B019'),
('SD52', 'Parvaiz', 'Khan', 'Security Guard', 'M', '11/12/1985', 15000, 'B013'),
('ST26', 'Bushra', 'Khan', 'Salesperson', 'F', '5/10/1990', 60000, 'B017'),
('SN99', 'Khalid', 'Kamal', 'Security Guard', 'M', '12/12/1992', 16000, 'B014'),
('SF7', 'Mubashir', 'Naveed', 'Receptionist', 'M', '1/12/1996', 30000, 'B016'),
('SG76', 'Awais', 'Qamar', 'Operations Manager', 'M', '9/4/1988', 80000, 'B015'),
('SW84', 'Muneer', 'Zaman', 'Marketing Manager', 'M', '7/1/1992', 70000, 'B021'),
('SZ34', 'Sana', 'Khan', 'Receptionist', 'F', '5/12/1996', 50000, 'B018')
```

```sql
insert into Client (clientNo , fName, lName, telNo, prefType, maxRent)
VALUES
('A001', 'Imad', 'Ahmad', '03004463173', '1 bed Apartment', '5000'),
('A002', 'Akbar', 'Majeed', '03125648789', 'Shared Apartment', '6000'),
('A003','Farukh','Javed','03468965741','Townhome','70000'),
('A004','Imran','Hashmi','03034321986','Bungalow','100000'),
('A005','Farhat','Javed','03218954219','Small Vacation Cottage','80000'),
('A006','Sajjad','Babar','03364512789','Multi Family home','180000'),
('A007','Sidhu','Moosewala','03111111111','3 room apartment','60000'),
('A008','Arshid','Khan','03211236957','Double story house','130000'),
('A009','Javed','Shiekh','03489137982','Single Family home','80000'),
('A010','Saira','Muneer','03007319654','Villa','500000'),
('A011','Poorab','Kumar','03184967852','Shared Apartment','9000'),
('A012','Faisal','Khan','03467845123','Townhome','75000'),
('A013','Abdus','Salam','03096598753','Villa','500000'),
('A014','Rab','Nawaz','03416385951','Bungalow','110000'),
('A015','Obaid','Sheikh','03426284759','Multi Family Home','160000'),
('A016','Qamar','Javed','03134679169','Villa','600000'),
('A017','Jannat','Mirza','03166969969','Codominium','90000'),
('A018','Babu','Rao','03104916872','Shared Apartment','15000'),
('A019','Sania','Mirza','03451535985','Bungalow','90000'),
('A020','Sham','Idrees','03108020500','1 bed Apartment','5000'),
('A021','Javed','Kazmi','03165288572','Single Family Home','90000')

insert into PrivateOwner (ownerNo, fName, lName, address, telNo)
values
('K01','Javed','Aziz','H# 85 Mandia, ATD ','03001245985'),
('K02','Sana','Bucha','H# 21 I-10, ISB','03368754953'),
('K03','Ali','Khan','H#45 KTS, HAR','03314915375'),
('K04','Ahmed','Akhtar','H#20 Supply, ATD','03457296348'),
('K05','Kabir','Singh','H#99 Salhad, ATD','03348719652'),
('K06','Parvaiz','Musharraf','H#86 G-6, ISB','03321596548'),
('K07','Benazir','Shah','H#286 DHA, KAR','03216598174'),
('K08','Jaan','Raheem','H#100 Cantt, LHR','03012000563'),
('K09','Umar','Gul','H#91 Cantt, HAV','03485265154'),
('K10','Raheem','Pardesi','H#20 H-6, ISB','03259826547'),
('K11','Hubaib','Naeem','H#65 G-9, ISB','03185400163'),
('K12','Qaiser','Khattak','H#156 Saddar, PEW','03420096050'),
('K13','Abdullah','Shah','H#48 Topi, SWB','03083032021'),
('K14','Babar','Khan','H#25 TIP,HAR','03058574321'),
('K15','Rehm','Nawaz','H#87 I-4, ISB','03065491032'),
('K16','Hamza','Akbar','H#152 Panian, HAR','03024595687'),
('K17','Nasir','Khan','H#756 Uni road, PEW','03461289567'),
('K18','Alex','Bhatti','H#301 Bahria Town, KAR','03487006320'),
('K19','Hareem','Shah','H#186 Cantt, MAN','03215906903'),
('K20','Waqar','Zaka','H#564 North Nazimabad,KAR','03237506501'),
('K21','Aamir','Liaqat','H#487 Gulshan Iqbal, KAR','03196585021')

insert into PropertyForRent (propertyNo, street, city, postcode, [type], rooms, rent, ownerNo, staffNo, branchNo)
values
('P01','S# 10','ISB','52000','Apartment','2','15000','K01','SA9','B010'),
('P02','S# 2','KAR','72400','Apartment','3','20000','K19','SG14','B012'),
('P03','S# 5','PEW','25000','Single Fam','4','50000','K09','SG37','B001'),
('P04','S# 1','HAV','22500','Villa','10','170000','K14','SG5','B002'),
('P05','S# 1','HAR','22620','Bungalow','4','70000','K10','SL21','B009'),
('P06','S# 2','LHR','54000','Townhome','3','40000','K03','SL41','B015'),
```

('P07','S# 9','SWB','23430','Single Fam','3','45000','K12','SP98','B013'),
('P08','S# 6','ATD','53000','Apartment','2','12000','K20','SK32','B003'),
('P09','S# 7','MAN','21300','Bungalow','4','60000','K07','SG76','B004'),
('P10','S# 8','ISB','52000','Condo','5','50000','K21','SG76','B018'),
('P11','S# 5','ISB','52000','2 Story','6','100000','K18','ST26','B016'),
('P12','S# 4','ATD','53000','Single Fam','4','45000','K04','SV56','B005'),
('P13','S# 5','ISB','52000','Apartment','2','18000','K13','ST91','B021'),
('P14','S# 6','KAR','72400','Townhome','3','35000','K11','SO61','B008'),
('P15','S# 9','LHR','54000','Apartment','2','16000','K15','SQ19','B014'),
('P16','S# 5','HAR','22620','Multi Fam','8','95000','K05','SJ37','B020'),
('P17','S# 3','ATD','53000','Apartment','2','10000','K17','SW84','B006'),
('P18','S# 7','ATD','53000','Townhome','4','50000','K08','ST26','B019'),
('P19','S# 4','ATD','53000','Single Fam','4','35000','K06','ST26','B011'),
('P20','S# 10','PEW','25000','2 Story','7','70000','K16','SF7','B017'),
('P21','S# 3','ISB','53000','Single Fam','3','30000','K02','SG76','B007')

insert into Viewing (clientNo, propertyNo, viewDate, comment)
values
('A013','P04','10/10/2020','Status Pending'),
('A001','P17','12/25/2018','Rented'),
('A014','P09','5/19/2019','Rented'),
('A011','P01','7/1/2019','Rented'),
('A006','P16','8/8/2020','Rented'),
('A019','P05','2/18/2018','Rented'),
('A010','P04','10/10/2020','Status Pending'),
('A020','P01','5/25/2018','Rented'),
('A007','P02','3/8/2019','Rented'),
('A017','P10','5/6/2019','Rented'),
('A002','P13','2/20/2020','Rented'),
('A021','P07','9/9/2019','Rented'),
('A009','P03','1/5/2020','Rented'),
('A015','P16','10/10/2020','Status Pending'),
('A004','P09','10/10/2020','Status Pending'),
('A008','P11','8/26/2019','Rented'),
('A018','P15','9/22/2018','Rented'),
('A003','P06','10/8/2019','Rented'),
('A016','P04','11/11/2018','Rented'),
('A012','P14','12/25/2019','Rented'),
('A005','P09','10/10/2020','Status Pending')

insert into Registration (clientNo, branchNo, staffNo, dateJoined)
values
('A001','B010','SG5','10/5/2018'),
('A002','B011','SO61','9/6/2018'),
('A003','B005','SW84','7/5/2018'),
('A004','B008','SP98','12/9/2018'),
('A005','B016','ST26','11/25/2018'),
('A006','B019','SG5','10/29/2018'),
('A007','B001','SW84','5/30/2018'),
('A008','B018','SG76','6/12/2018'),
('A009','B009','ST26','12/12/2018'),
('A010','B012','SW84','6/29/2018'),
('A011','B017','SP98','8/16/2018'),
('A012','B004','SO61','12/18/2018'),
('A013','B021','SG5','11/11/2018'),
('A014','B013','ST26','11/15/2018'),

('A015','B020','SW84','9/11/2018'),
('A016','B003','SG76','1/5/2019'),
('A017','B014','SO61','1/25/2019'),
('A018','B006','SG76','2/3/2019'),
('A019','B015','SO61','1/20/2019'),
('A020','B002','ST26','11/8/2018'),
('A021','B007','SW84','12/30/2018')

Select distinct(city) from Branch order by city desc;

## 1.2   LAB 7

Q#1 Print the list of postcodes without any repetition

**ANS** Select distinct(postcode) from Branch;

Q#2 Print all fName from Staff without repetition

**ANS** Select distinct(fName) from Staff;

Q#3 List all staff with renaming all its columns in results

**ANS** Select staffNo as ID, fName as FirstNAme, lName as LastName, [position] as Allocation, sex as Gender, DOB as Birth, salary as Wages, branchNo as Branch from Staff;

Q#4 List all clients with re-naming all its columns to synonyms.

**ANS** SELECT clientNo as StakeHolderID, fName as FirstName, lName as LastName, telNo as PhoneNo, prefType as Preference, maxRent as MaximumRent  FROM Client;

Q#5 List all staff with a salary greater than 10,000.

**ANS** SELECT  salary FROM  Staff where salary >10000;

Q#6 List all managers and supervisors.

**ANS** SELECT  [position] FROM  Staff Where [position] = 'supervisor' OR [position] = 'manager';

## 1.3 LAB 8

## 2 Abdul Haseeb Khan (SP19-BCS-001)

## 2.1 Lab 6

## 2.2 Lab 7

## 2.3 Lab 8

## 3 Ashfaq Rahim (SP19-BCS-003)

## 3.1 Lab 6

## 3.2 Lab 7

## 3.3 Lab 8

## 4 Fahad Afzal (SP19-BCS-006)

## 4.1 Lab 6

## 4.2 Lab 7

## 4.3 Lab 8

# 5 Hassaan Shahnawaz (SP19-BCS-008)

## 5.1 Lab 6

## 5.2 Lab 7

## 5.3 Lab 8

# 6 Hassan Ali Jadoon (SP19-BCS-009)

## 6.1 Lab 6

## 6.2 Lab 7

## 6.3 Lab 8

# 7 Imad Ahmad (SP19-BCS-011)

## 7.1 Lab 6

## 7.2 Lab 7

## 7.3 Lab 8

# 8 Khanzada Haider Ali (SP19-BCS-013)

## 8.1 Lab 6

## 8.2 Lab 7

## 8.3 Lab 8

# 9  Sardar Badar Saghir (SP19-BCS-022)

## 9.1  Lab 6

**create table Viewing (clientNo varchar(20) NOT NULL References Client(clientNo), propertyNo varchar(20) NOT NULL References PropertyForRent(propertyNo), viewDate DateTime NOT NULL, comment varchar(200) NOT NULL);**

**insert into viewing(clientNo, propertyNo, viewDate, comment)**

**values**

('A013','P04','10/10/2020','Status Pending'),

('A001','P17','12/25/2018','Rented'),

('A014','P09','5/19/2019','Rented'),

('A011','P01','7/1/2019','Rented'),

('A006','P16','8/8/2020','Rented'),

('A019','P05','2/18/2018','Rented'),

('A010','P04','10/10/2020','Status Pending'),

('A020','P01','5/25/2018','Rented'),

('A007','P02','3/8/2019','Rented'),

('A017','P10','5/6/2019','Rented'),

('A002','P13','2/20/2020','Rented'),

('A021','P07','9/9/2019','Rented'),

('A009','P03','1/5/2020','Rented'),

('A015','P16','10/10/2020','Status Pending'),

('A004','P09','10/10/2020','Status Pending'),

('A008','P11','8/26/2019','Rented'),

('A018','P15','9/22/2018','Rented'),

('A003','P06','10/8/2019','Rented'),

('A016','P04','11/11/2018','Rented'),

('A012','P14','12/25/2019','Rented'),

('A005','P09','10/10/2020','Status Pending');

## 9.2  Lab 7

Q#1 Print the list of postcodes without any repetition

**ANS** Select distinct(postcode) from Branch;


Q#2 Print all fName from Staff without repetition

**ANS** Select distinct(fName) from Staff;


Q#3 List all staff with renaming all its columns in results

**ANS** Select staffNo as ID, fName as FirstNAme, lName as LastName, [position] as Allocation, sex as Gender, DOB as Birth, salary as Wages, branchNo as Branch from Staff;


Q#4 List all clients with re-naming all its columns to synonyms.

**ANS** SELECT clientNo as StakeHolderID, fName as FirstName, lName as LastName, telNo as PhoneNo, prefType as Preference, maxRent as MaximumRent  FROM Client;


Q#5 List all staff with a salary greater than 10,000.

**ANS** SELECT  salary FROM  Staff where salary >10000;


Q#6 List all managers and supervisors.

**ANS** SELECT  [position] FROM  Staff Where [position] = 'supervisor' OR [position] = 'manager';


## 9.3  Lab 8

--Examples


SELECT staffNo, fName, lName, salary FROM Staff ORDER BY salary DESC;

SELECT propertyNo, type, rooms, rent FROM PropertyForRent ORDER BY type;

SELECT propertyNo, type, rooms, rent FROM PropertyForRent ORDER BY type, rent DESC;

SELECT COUNT(DISTINCT propertyNo) AS myCount FROM Viewing WHERE viewDate BE-TWEEN '1-May-04' AND '31-May-04';

SELECT COUNT(staffNo) AS myCount, SUM(salary) AS mySum FROM Staff WHERE position = 'Manager';

SELECT MIN(salary) AS myMin, MAX(salary) AS myMax, AVG(salary) AS myAvg FROM Staff;

SELECT staffNo, COUNT(salary) FROM Staff; --shwoing error that no aggregate or group clause

SELECT staffNo, fName, lName, position, salary FROM Staff WHERE salary > SOME (SELECT salary FROM Staff WHERE branchNo = 'B003');

SELECT staffNo, fName, lName, position, salary FROM Staff WHERE salary > ALL (SELECT salary FROM Staff WHERE branchNo = 'B003');


-- For DreamHome case study write at least 3 examples of each category for sorting, group-ing and aggregate operations. Share your exercises as advised in the lab.

--sorting clauses

SELECT  fName, lName, position FROM Staff ORDER BY lName ASC;

SELECT staffNo, fName, salary FROM Staff ORDER BY staffNo DESC;

SELECT fName FROM Staff ORDER BY fName DESC;



--grouping clauses

SELECT staffNo, fName, salary FROM Staff WHERE position = 'Assistant' AND salary < 10000;

SELECT fName, salary FROM Staff WHERE sex = 'M' AND position = 'Manager';

SELECT fName, lName FROM Staff WHERE (SELECT AVG(salary) FROM Staff) < salary;


--aggregate clauses

SELECT COUNT(DISTINCT(propertyNo)) AS TotalProperty FROM Viewing WHERE viewDate BE-TWEEN '1-May-00' AND '31-May-04';

SELECT  propertyNo AS ClientID FROM Viewing WHERE viewDate BETWEEN '1-May-00' AND '31-May-04';

SELECT clientNo, propertyNo FROM Viewing WHERE viewDate BETWEEN '1-May-00' AND '31-May-09';

# 10  Muhammad Awais (SP19-BCS-033)

## 10.1 Lab 6

## 10.2 Lab 7

## 10.3 Lab 8