TIS1101 Database Fundamentals

Assignment 2

Title: <Clinic Management System>

Prepared by:

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CORRECTED AND NORMALIZED ERD

DATA DICTIONARY

TABLE NAME	ATTRIBUTE NAME	CONTENTS	TYPE	FORMAT	RANGE	REQUIRED	PK OR FK	FK REFERENCED TABLE
DOCTOR	DOCTOR_ID	Doctor ID	VARCHAR2 (5)	99999		Y	PK	
	DOCTOR_FNAME	Doctor First Name	VARCHAR2 (20)	Xxxxx				
	DOCTOR_LNAME	Doctor Last Name	VARCHAR2 (20)	Xxxxx				
	DOCTOR_GENDER	Doctor Gender	CHAR (1)	X	M / F			
	DOCTOR_ICNUMBER	Doctor IC Number	VARCHAR2 (14)	000101-01-0101				
	DOCTOR_CONTACTNO	Doctor Contact Number	VARCHAR (12)	010-0000000				
	DOCTOR_QUALIFICATION	Doctor Qualification	VARCHAR2 (30)	Xxxxx				
	DOCTOR_SPECIALISATION	Doctor Specialisation	VARCHAR2 (40)	Xxxxx				

SCHEDULE	SCEDULE_ID	Schedule ID	VARCHAR2 (5)	99999		Y	PK	
	SCEDULE_DAY	Schedule Day	CHAR (3)	XXX				
	SCEDULE_TIME	Schedule Time	VARCHAR2 (5)	13:00				
	DOCTOR_ID	Doctor ID	VARCHAR2 (5)	99999			FK	DOCTOR_ID

PATIENT	PATIENT_ID	Patient ID	VARCHAR2 (5)	99999		Y	PK	
	PATIENT_FNAME	Patient First Name	VARCHAR2 (20)	Xxxxx		Y		
	PATIENT_LNAME	Patient Last Name	VARCHAR2 (20)	Xxxxx		Y		
	PATIENT_GENDER	Patient Gender	CHAR (1)	X	M / F			
	PATIENT_ICNUMBER	Patient IC Number	VARCHAR2 (15)	000101-01-0101				
	PATIENT_STREETNAME	Patient Street Name	VARCHAR2 (30)	Xxxxx				
	PATIENT_CITY	Patient City	VARCHAR2 (15)	Xxxxx				
	PATIENT_ZIPCODE	Patient Zip Code	CHAR (5)	81100				
	PATIENT_CONTACTNO	Patient Contact Number	VARCHAR2 (12)	010-0000000				

MEDICAL RECORD	RECORD_ID	Record ID	VARCHAR2 (5)	99999		Y	PK	
	RECORD_DIAGNOSIS	Record Diagnosis	VARCHAR2 (50)	Xxxxx				
	RECORD_SERVICENAME	Record Service Name	VARCHAR2 (15)	Xxxxx	'Consultation', 'Operation', 'Screening Test',' Vaccination'			
	RECORD_DESCRIPTION	Record Description	VARCHAR2 (50)	Xxxxx				
	PATIENT_ID	Patient ID	VARCHAR2 (5)	99999			FK	PATIENT_ID
APPOINTMENT	APPOINMENT_ID	Appointment ID	NUMBER (5)	99999		Y	PK	
	APPOINMENT_DATE	Appointment Date	DATE	03-JAN-21				
	APPOINMENT_DESCRIPTION	Appointment Description	VARCHAR2 (30)	Xxxxx				
	DOCTOR_ID	Doctor ID	VARCHAR2 (5)	99999			FK	DOCTOR_ID
	PATIENT_ID	Patient ID	VARCHAR2 (5)	99999			FK	PATIENT_ID

PRESCRIPTION	PRESCRIPTION_ID	Prescription ID	VARCHAR2 (5)	99999		Y	PK	
	PRESCRIPTION_DATE	Prescription Date	DATE	DD-MON-YY				
	APPOINMENT_ID	Appointment ID	NUMBER (5)	99999			FK	APPOINTMENT_ID
BILL	BILL_ID	Bill ID	VARCHAR2 (5)	99999		Y	PK	
	BILL_FEE	Bill Fee	NUMBER (7,2)	99999.99				
	PRESCRIPTION_ID	Prescription ID	VARCHAR2 (5)	99999			FK	PRESCRIPTION_ID
MEDICINE	MEDICINE_ID	Medicine ID	VARCHAR2 (5)	99999		Y	PK	
	MEDICINE_NAME	Medicine Name	VARCHAR2 (50)	Xxxxx				
	MEDICINE_PRICE	Medicine Price	NUMBER (7,2)	99999.99				
	MEDICINE_DESCRIPTION	Medicine Description	VARCHAR2 (80)	Xxxxx				

TREATMENT	PRESCRIPTION_ID	Prescription ID	VARCHAR2 (5)	99999		Y	PK, FK.	PRESCRIPTION_ID
	MEDICINE_ID	Medicine ID	VARCHAR2 (5)	99999		Y	PK, FK	MEDICINE_ID
	TREATMENT_ MEDICINEAMOUNT	Medicine Amount	NUMBER (2)	99				
	TREATMENT_DOSAGE	Treatment Dosage	NUMBER (2)	99				
	TREATMENT_PEROID	Treatment Period	NUMBER (2)	99				

CREATION TABLE

*Must create the table following the sequences.

SEQUENCE	TABLE NAME	CODE
1	DOCTOR	CREATE TABLE DOCTOR (DOCTOR_ID VARCHAR2(5) NOT NULL PRIMARY KEY, DOCTOR_FNAME VARCHAR2(20), DOCTOR_LNAME VARCHAR2(20), DOCTOR_GENDER CHAR(1), DOCTOR_ICNUMBER VARCHAR2(14), DOCTOR_CONTACTNO VARCHAR(12), DOCTOR_QUALIFICATION VARCHAR2(30), DOCTOR_SPECIALISATION VARCHAR2(40));
2	SCHEDULE	CREATE TABLE SCHEDULE (SCHEDULE_ID VARCHAR2(5) NOT NULL PRIMARY KEY, SCHEDULE_DAY CHAR (3), SCHEDULE_TIME VARCHAR2(5), DOCTOR_ID VARCHAR2(5), FOREIGN KEY (DOCTOR_ID) REFERENCES DOCTOR);

3	PATIENT	CREATE TABLE PATIENT(PATIENT_ID VARCHAR2(5) NOT NULL PRIMARY KEY, PATIENT_FNAME VARCHAR2(20) NOT NULL, PATIENT_LNAME VARCHAR2(20) NOT NULL, PATIENT_GENDER CHAR(1) CHECK (PATIENT_GENDER IN('F','M')), PATIENT_ICNUMBER VARCHAR2(15), PATIENT_STREETNAME VARCHAR2(30), PATIENT_CITY VARCHAR2(15), PATIENT_ZIPCODE CHAR(5), PATIENT_CONTACTNO VARCHAR2(12));
4	MEDICAL RECORD	CREATE TABLE MEDICAL_RECORD(RECORD_ID VARCHAR2(5) NOT NULL PRIMARY KEY, RECORD_DIAGNOSIS VARCHAR2(50), RECORD_SERVICENAME VARCHAR2(15) CHECK(RECORD_SERVICENAME IN('Consultation','Operation','Screening Test','Vaccination')), RECORD_DESCRIPTION VARCHAR2(50), PATIENT_ID VARCHAR2(5) REFERENCES PATIENT(PATIENT_ID));
5	APPOINTMENT	CREATE TABLE APPOINTMENT(APPOINTMENT_ID NUMBER(5) NOT NULL PRIMARY KEY, APPOINTMENT_DATE DATE, APPOINTMENT_DESCRIPTION VARCHAR2 (30), DOCTOR_ID VARCHAR2(5) REFERENCES DOCTOR(DOCTOR_ID), PATIENT_ID VARCHAR2(5) REFERENCES PATIENT(PATIENT_ID));
6	PRESCRIPTION	CREATE TABLE PRESCRIPTION(PRESCRIPTION_ID VARCHAR2(5) NOT NULL PRIMARY KEY, PRESCRIPTION_DATE DATE, APPOINTMENT_ID NUMBER(5) REFERENCES APPOINTMENT(APPOINTMENT_ID));

7	BILL	CREATE TABLE BILL(BILL_ID VARCHAR2 (5) NOT NULL PRIMARY KEY, BILL_FEE NUMBER (7,2), PRESCRIPTION_ID VARCHAR2(5) REFERENCES PRESCRIPTION(PRESCRIPTION_ID));
8	MEDICINE	CREATE TABLE MEDICINE(MEDICINE_ID VARCHAR2(5) NOT NULL PRIMARY KEY, MEDICINE_NAME VARCHAR2(50), MEDICINE_PRICE NUMBER(7,2), MEDICINE_DESCRIPTION VARCHAR2(80));
9	TREATMENT	CREATE TABLE TREATMENT(PRESCRIPTION_ID VARCHAR2 (5) NOT NULL, MEDICINE_ID VARCHAR2 (5) NOT NULL, TREATMENT_DOSAGE NUMBER(2), TREATMENT_PERIOD NUMBER(2), TREATMENT_MEDICINEAMOUNT NUMBER(2), PRIMARY KEY (PRESCRIPTION_ID,MEDICINE_ID), FOREIGN KEY (MEDICINE_ID) REFERENCES MEDICINE, FOREIGN KEY (PRESCRIPTION_ID) REFERENCES PRESCRIPTION);

DATA INSERTION

*Must insert the data into the table following the sequences.

SEQUENCE	TABLE NAME	NUMBER OF DATA	CODE
1	DOCTOR	1	INSERT INTO DOCTOR VALUES('88001','Dr Ming Feng','Chan','F','601130-01-5124','011-11526332','MMED in Universiti Malaya','Family Medicine');
		2	INSERT INTO DOCTOR VALUES('88002','Dr Stephen','Chou','M','890113-01-6133','019-7599632','MBBS in University of Adelaide','Medicine');

2	SCHEDULE	1	INSERT INTO SCHEDULE VALUES ('20011','MON','10:00','88002');
		2	INSERT INTO SCHEDULE VALUES ('20012','MON','15:00','88001');
		3	INSERT INTO SCHEDULE VALUES ('20013','TUE','10:00','88002');
		4	INSERT INTO SCHEDULE VALUES ('20014','TUE','15:00','88001');
		5	INSERT INTO SCHEDULE VALUES ('20015','WED','10:00','88002');
		6	INSERT INTO SCHEDULE VALUES ('20016','WED','15:00','88001');
		7	INSERT INTO SCHEDULE VALUES ('20017','THU','10:00','88002');
		8	INSERT INTO SCHEDULE VALUES ('20018','THU','15:00','88001');
		9	INSERT INTO SCHEDULE VALUES ('20019','FRI','10:00','88002');
		10	INSERT INTO SCHEDULE VALUES ('20020','FRI','15:00','88001');
		11	INSERT INTO SCHEDULE VALUES ('20021','SAT','10:00','88002');
		12	INSERT INTO SCHEDULE VALUES ('20022','SUN','10:00','88001');
		13	INSERT INTO SCHEDULE VALUES ('20023','MON','15:00','88002');

3	PATIENT	1	INSERT INTO PATIENT VALUES('00001','Yin','Zhu','F','650213-01-5354','Jalan Matahari 22','Johor Bahru','81100','013-8954445');
		2	INSERT INTO PATIENT VALUES('00002','Xing Xing','Chou','M','600131-01-5753','Jalan Harimau 1','Johor Bahru','81100','012-9856633');
		3	INSERT INTO PATIENT VALUES('00003','Yu He','Ho','F','891112-08-9682','Jalan Beruang 34','Ulu Tiram','81800','011-11754444');
		4	INSERT INTO PATIENT VALUES('00004','Siti Aisyah','Binti Ahmed','F','991214-01-6150','Jalan Kenanga 45','Kota Tinggi','81900','013-8955566');
		5	INSERT INTO PATIENT VALUES('00005','Kumar','Prashant','M','890109-01-8123','Jalan Anggerik 52','Johor Bahru','81100','019-7858855');
		6	INSERT INTO PATIENT VALUES('00006','Ujjwal','Sinha','M','550101-01-5113','Jalan Bakawali 1','Johor Bahru','81100','011-11117521');
		7	INSERT INTO PATIENT VALUES('00007','Theevashini','A/P Rajen','F','990924-01-6182','Jalan Desa Tebrau 20','Johor Bahru','81100','016-9856621');
		8	INSERT INTO PATIENT VALUES('00008','Safiyya Aliaa','Binti Abu Bakar','F','960624-01-6236','Jalan Seroja 34','Kulai','81000','011-11235333');
		9	INSERT INTO PATIENT VALUES('00009','Washil','Al Ahdab','M','100304-01-8355','Jalan Seroja 33','Kulai','81000','018-7546522');
		10	INSERT INTO PATIENT VALUES('00010','Suveetha','A/P Sukumaran','F','990324-01-6156','Jalan Gaya','Johor Bahru','81100','013-9665562');

4	MEDICAL RECORD	1	INSERT INTO MEDICAL_RECORD VALUES('10001','Throat Inflammation','Consultation','Caused by flu','00001');
		2	INSERT INTO MEDICAL_RECORD VALUES('10002','Tetanus','Vaccination','Tetanus positive, seizure, jaw cramping','00002');
		3	INSERT INTO MEDICAL_RECORD VALUES('10003','Red Eyes','Consultation','Caused by over-wearing contact lenses','00003');
		4	INSERT INTO MEDICAL_RECORD VALUES('10004','Second-degree Burns','Consultation','Accidents with ovens and stoves','00004');
		5	INSERT INTO MEDICAL_RECORD VALUES('10005','Anaemia','Consultation','Iron-deficiency anemia','00005');
		6	INSERT INTO MEDICAL_RECORD VALUES('10006','High Blood Pressure','Screening Test','High blood pressure possitive: 140/90mmHg','00006');
		7	INSERT INTO MEDICAL_RECORD VALUES('10007','Urinary Test','Screening Test','Pregnancy positive, severe nausea, vomitting','00007');
		8	INSERT INTO MEDICAL_RECORD VALUES('10008','Food Poisoning','Consultation','Possibly taken contaminated food','00008');
		9	INSERT INTO MEDICAL_RECORD VALUES('10009','Circumcision','Operation','Long foreskin from genital area, good recovery','00009');
		10	INSERT INTO MEDICAL_RECORD VALUES('10010','Cholera Vaccine','Vaccination','Travel Vaccination','00010');

5	APPOINTMENT	1	INSERT INTO APPOINTMENT VALUES(1,TO_DATE('2013/05/03 10:00:44', 'yyyy/mm/dd hh24:mi:ss'),'Sore throat, cough','88002','00001');
		2	INSERT INTO APPOINTMENT VALUES(2,TO_DATE('2013/10/01 13:45:41', 'yyyy/mm/dd hh24:mi:ss'),'Possible tetanus from rust','88002','00002');
		3	INSERT INTO APPOINTMENT VALUES(3,TO_DATE('2014/01/01 16:00:30', 'yyyy/mm/dd hh24:mi:ss'),'Sore eye, dryness','88001','00003');
		4	INSERT INTO APPOINTMENT VALUES(4,TO_DATE('2015/08/24 17:15:26', 'yyyy/mm/dd hh24:mi:ss'),'Blister from burn','88001','00004');
		5	INSERT INTO APPOINTMENT VALUES(5,TO_DATE('2016/02/11 11:15:08', 'yyyy/mm/dd hh24:mi:ss'),'Dizzy, breathing difficulties','88002','00005');
		6	INSERT INTO APPOINTMENT VALUES(6,TO_DATE('2016/03/03 12:45:36', 'yyyy/mm/dd hh24:mi:ss'),'Severe headaches, chest pain','88002','00006');
		7	INSERT INTO APPOINTMENT VALUES(7,TO_DATE('2017/07/13 20:30:01', 'yyyy/mm/dd hh24:mi:ss'),'Run urinary test','88001','00007');
		8	INSERT INTO APPOINTMENT VALUES(8,TO_DATE('2017/08/21 21:20:12', 'yyyy/mm/dd hh24:mi:ss'),'Vomit, diarrhea, nausea','88001','00008');
		9	INSERT INTO APPOINTMENT VALUES(9,TO_DATE('2021/02/14 14:50:45', 'yyyy/mm/dd hh24:mi:ss'),'Cicumcision operation','88001','00009');
		10	INSERT INTO APPOINTMENT VALUES(10,TO_DATE('2021/02/15 15:30:00', 'yyyy/mm/dd hh24:mi:ss'),'Cholera vaccination','88002','00010');

6	PRESCRIPTION	1	INSERT INTO PRESCRIPTION VALUES('99001','03-MAY-13',1);
		2	INSERT INTO PRESCRIPTION VALUES('99002','01-OCT-13',2);
		3	INSERT INTO PRESCRIPTION VALUES('99003','01-JAN-14',3);
		4	INSERT INTO PRESCRIPTION VALUES('99004','24-AUG-15',4);
		5	INSERT INTO PRESCRIPTION VALUES('99005','11-FEB-16',5);
		6	INSERT INTO PRESCRIPTION VALUES('99006','03-MAR-16',6);
		7	INSERT INTO PRESCRIPTION VALUES('99007','13-JUL-17',7);
		8	INSERT INTO PRESCRIPTION VALUES('99008','21-AUG-17',8);
		9	INSERT INTO PRESCRIPTION VALUES('99009','14-FEB-21',9);
		10	INSERT INTO PRESCRIPTION VALUES('99010','15-FEB-21',10);

7	BILL	1	INSERT INTO BILL VALUES('B0001','10.00','99001');
		2	INSERT INTO BILL VALUES('B0002','120.00','99002');
		3	INSERT INTO BILL VALUES('B0003','9.50','99003');
		4	INSERT INTO BILL VALUES('B0004','140.00','99004');
		5	INSERT INTO BILL VALUES('B0005','138.60','99005');
		6	INSERT INTO BILL VALUES('B0006','20.50','99006');
		7	INSERT INTO BILL VALUES('B0007','90.00','99007');
		8	INSERT INTO BILL VALUES('B0008','12.00','99008');
		9	INSERT INTO BILL VALUES('B0009','5.95','99009');
		10	INSERT INTO BILL VALUES('B0010','120.00','99010');

8	MEDICINE	1	INSERT INTO MEDICINE VALUES('22001', 'Acriflavin 0.1% Lotion 5ml', 10.00, 'Infected skin, lesions, cuts, abrasions, wounds and burns');
		2	INSERT INTO MEDICINE VALUES('22002', 'Tincture Ipecac', 1.00, 'Cough');
		3	INSERT INTO MEDICINE VALUES('22003', 'Aqueous Cream 5 ml', 8.00, 'Dry skin');
		4	INSERT INTO MEDICINE VALUES('22004', 'Ascorbic Acid 100 mg Tablet', 0.50, 'Vitamin C deficiency');
		5	INSERT INTO MEDICINE VALUES('22005', 'Bisacodyl 5 mg Tablet', 1.20, 'Constipation');
		6	INSERT INTO MEDICINE VALUES('22006', 'Calamine Cream 10 ml', 7.50, 'Relieves minor skin irritations');
		7	INSERT INTO MEDICINE VALUES('22007', 'Charcoal, Activated 250 mg Tablet', 0.80, 'Diarrhoea and food poisoning');
		8	INSERT INTO MEDICINE VALUES('22008', 'Chloramphenicol 0.5% Eye Drops 10 ml', 20.00, 'Broad spectrum antibiotic in superficial eye infections');
		9	INSERT INTO MEDICINE VALUES('22009', 'Methyl Salicylate 25% Ointment 10 ml', 16.80, 'Relief of minor aches and pains of muscles and joints');
		10	INSERT INTO MEDICINE VALUES('22010', 'Miconazole 2% Cream 15 ml', 23.20, 'Antifungal agent');
		11	INSERT INTO MEDICINE VALUES('22011', 'Oral Rehydration Salt 20.5 g' ,0.25, 'Replacement of fluid and electrolytes loss in diarrhoea');
		12	INSERT INTO MEDICINE VALUES('22012', 'Paracetamol 120 mg', 0.85, 'Mild to moderate pain and pyrexia');
		13	INSERT INTO MEDICINE VALUES('22013', 'Prochlorperazine Maleate 5mg Tablet', 2.00, 'Severe nausea and vomiting');

```
14 INSERT INTO MEDICINE VALUES('22014', 'Salbutamol 0.5% Inhalation Solution 50 ml', 21.60,
   'Asthma and reversible airways obstruction');

15 INSERT INTO MEDICINE VALUES('22015', 'Tetanus Toxoid Injection', 120.00, 'Immunization
   against tetanus infection');

16 INSERT INTO MEDICINE VALUES('22016', 'Thymol Compound Gargle 100 ml', 6.20, 'For sore
   throat and minor mouth inflammation');

17 INSERT INTO MEDICINE VALUES('22017', 'Vitamin B Complex Tablet 30 mg', 1.20, 'Prophylaxis
   and treatment of vitamin B deficiency');

18 INSERT INTO MEDICINE VALUES('22018', 'Water for Injection 10 ml', 1.00, 'As a diluent for the
   administration of medications');

19 INSERT INTO MEDICINE VALUES('22019', 'Zinc Oxide Talet 30 mg', 2.60, 'For relief of burning and
   soreness in haemorrhoids');

20 INSERT INTO MEDICINE VALUES('22020', 'Zink Oxide Cream 30 ml', 35.00, 'Skin protective in
   various skin conditions such as eczema');

21 INSERT INTO MEDICINE VALUES('22021', 'Diphenhydramine Hydrochloride 14 mg', 1.00, 'Cough');

22 INSERT INTO MEDICINE VALUES('22022', 'Ferrous Fumarate 200 mg Tablet', 3.30, 'Prevention and
   treatment of iron-deficiency anaemias');

23 INSERT INTO MEDICINE VALUES('22023', 'Folic Acid 5 mg Tablet', 1.50, 'For the prevention and
   treatment of folate deficiency states ');

24 INSERT INTO MEDICINE VALUES('22024', 'Glyceryl Trinitrate 0.5 mg Tablet', 2.10, 'Prophylaxis,
   treatment of angina and left ventricular failure');

25 INSERT INTO MEDICINE VALUES('22025', 'Magnesium Trisilicate Tablet', 4.10, 'Heartburn,
   dyspepsia');
```

```
26 INSERT INTO MEDICINE VALUES('22026', 'Hypromellose 0.3% Eye Drop 10 ml', 9.50, 'For relief of dry eyes and eye irritation');

27 INSERT INTO MEDICINE VALUES('22027', 'Rabies Vaccine Injection', 240.00, 'For prevention against rabies');
28 INSERT INTO MEDICINE VALUES('22028', 'Cholera Vaccine Injection', 120.00, 'For prevention against cholera');

29 INSERT INTO MEDICINE VALUES('22029', 'Hepatitis A Vaccine Injection', 99.00, 'For prevention against Hepatitis A');

30 INSERT INTO MEDICINE VALUES('22030', 'Hepatitis B Vaccine Injection', 99.00, 'For prevention against Hepatitis B');
```

9	TREATMENT	1	INSERT INTO TREATMENT VALUES('99001','22002',2,5,10);
		2	INSERT INTO TREATMENT VALUES('99002','22015',1,1,1);
		3	INSERT INTO TREATMENT VALUES('99003','22026',1,1,1);
		4	INSERT INTO TREATMENT VALUES('99004','22001',2,7,14);
		5	INSERT INTO TREATMENT VALUES('99005','22022',3,14,42);
		6	INSERT INTO TREATMENT VALUES('99006','22025',1,5,5);
		7	INSERT INTO TREATMENT VALUES('99007','22023',2,30,60);
		8	INSERT INTO TREATMENT VALUES('99008','22013',2,3,6);
		9	INSERT INTO TREATMENT VALUES('99009','22012',1,7,7);
		10	INSERT INTO TREATMENT VALUES('99010','22028',1,1,1);

DATA MANIPULATION WITH SQL

1. Aggregate Function
   a. Code :

```
SELECT MEDICINE_NAME, MEDICINE_DESCRIPTION, MEDICINE_PRICE
        FROM MEDICINE
                WHERE MEDICINE_PRICE < (SELECT
                AVG(MEDICINE_PRICE) FROM MEDICINE)
                AND MEDICINE_NAME LIKE '%mg%'
                        ORDER BY MEDICINE_PRICE;
```

   b. Purpose:
   To display the medicine name, description and its price in a chronological order regarding medicine_price, at which its medicine price must be below the average price and, medicine name must contain “mg”.

   c. Screenshot of Result after query execution:

	MEDICINE_NAME	MEDICINE_DESCRIPTION	MEDICINE_PRICE
1	Ascorbic Acid 100 mg Tablet	Vitamin C deficiency	0.5
2	Charcoal, Activated 250 mg Tablet	Diarrhoea and food poisoning	0.8
3	Paracetamol 120 mg	Mild to moderate pain and pyrexia	0.85
4	Diphenhydramine Hydrochloride 14 mg	Cough	1
5	Bisacodyl 5 mg Tablet	Constipation	1.2
6	Vitamin B Complex Tablet 30 mg	Prophylaxis and treatment of vitamin B deficiency	1.2
7	Folic Acid 5 mg Tablet	For the prevention and treatment of folate deficiency states	1.5
8	Prochlorperazine Maleate 5mg Tablet	Severe nausea and vomiting	2
9	Glyceryl Trinitrate 0.5 mg Tablet	Prophylaxis, treatment of angina and left ventricular failure	2.1
10	Zinc Oxide Talet 30 mg	For relief of burning and soreness in haemorrhoids	2.6
11	Ferrous Fumarate 200 mg Tablet	Prevention and treatment of iron-deficiency anaemias	3.3

2. Query with a ***group by*** and ***having*** clauses
   a. Code:

```
SELECT SCHEDULE_DAY, COUNT(SCHEDULE_ID) FROM SCHEDULE
        GROUP BY SCHEDULE_DAY
                HAVING COUNT(SCHEDULE_DAY) > 1
        ORDER BY COUNT(SCHEDULE_ID) DESC;
```

   b. Purpose:
   To display a frequency distribution of schedule day in order to know the number of day that has more than one time slot scheduled sorted by highest count

   c. Screenshot of Result after query execution:

	SCHEDULE_DAY	COUNT(SCHEDULE_ID)
1	MON	3
2	FRI	2
3	TUE	2
4	THU	2
5	WED	2

3. Triggers
   a. Code:

```
CREATE OR REPLACE TRIGGER
UPDATE_TREATMENT_MEDICINEAMOUNT
        AFTER INSERT ON TREATMENT
        FOR EACH ROW
        BEGIN
                UPDATE TREATMENT
                SET TREATMENT_MEDICINEAMOUNT =
                TREATMENT_DOSAGE*TREATMENT_PERIOD;
       END;
```

   b. Purpose:
   To help the doctor in the clinic update the total amount of medicine needed for the treatment automatically after inserting a new row of treatment dosage and period.

   c. Code to execute:
   INSERT INTO TREATMENT VALUES('99011','22002',2,5,0);

   d. Screenshot of Result after query execution:
      i. Appointment table need to insert new appointment for new prescription
      Eg : INSERT INTO APPOINTMENT VALUES(11,TO_DATE('2013/09/03 10:00:00', 'yyyy/mm/dd hh24:mi:ss'),'Sore throat, cough','88002','00001');

	APPOINTMEN...	APPOINTMENT_DATETIME	APPOINTMENT_DESCRIPTION	DOCTOR_ID	PATIENT_ID
1	1	03-MAY-13	Sore throat, cough	88002	00001
2	2	01-OCT-13	Possible tetanus from rust	88002	00002
3	3	01-JAN-14	Sore eye, dryness	88001	00003
4	4	24-AUG-15	Blister from burn	88001	00004
5	5	11-FEB-16	Dizzy, breathing difficulties	88002	00005
6	6	03-MAR-16	Severe headaches, chest pain	88002	00006
7	7	13-JUL-17	Run urinary test	88001	00007
8	8	21-AUG-17	Vomit, diarrhea, nausea	88001	00008
9	9	14-FEB-21	Cicumcision operation	88001	00009
10	10	15-FEB-21	Cholera vaccination	88002	00010
11	11	03-SEP-13	Sore throat, cough	88002	00001

      ii. Prescription table need to insert new prescription for new treatment
      Eg : INSERT INTO PRESCRIPTION VALUES('99011','03-SEP-13',11);

	PRESCRIPTION_ID	PRESCRIPTION_DATE	APPOINTMENT_ID
1	99001	03-MAY-13	1
2	99002	01-OCT-13	2
3	99003	01-JAN-14	3
4	99004	24-AUG-15	4
5	99005	11-FEB-16	5
6	99006	03-MAR-16	6
7	99007	13-JUL-17	7
8	99008	21-AUG-17	8
9	99009	14-FEB-21	9
10	99010	15-FEB-21	10
11	99011	03-SEP-13	11

      iii. The image below shows the TREATMENT table after the trigger is fired.The inserted data for TREATMENT_MEDICINEAMOUNT in the code is initially 0,but it is updated to the correct value after the trigger is fired.

	PRESCRIPTION_ID	MEDICINE_ID	TREATMENT_DOSAGE	TREATMENT_PERIOD	MEDICINE_AMOUNT
1	99001	22002	2	5	10
2	99002	22015	1	1	1
3	99003	22026	1	1	1
4	99004	22001	2	7	14
5	99005	22022	3	14	42
6	99006	22025	1	5	5
7	99007	22023	2	30	60
8	99008	22013	2	3	6
9	99009	22012	1	7	7
10	99010	22028	1	1	1
11	99011	22002	2	5	10

4. Stored Procedure
   a. Code:

```
CREATE OR REPLACE PROCEDURE CHANGESCHEDULE
(SCHEDULEID IN VARCHAR2,
 SCHEDULEDAY IN CHAR,
 SCHEDULETIME IN VARCHAR2,
 DOCTORID IN VARCHAR2
)
AS
BEGIN
        DELETE FROM SCHEDULE
        WHERE SCHEDULE.SCHEDULE_DAY = SCHEDULEDAY
        AND SCHEDULE.SCHEDULE_TIME = SCHEDULETIME;
        INSERT INTO SCHEDULE VALUES(SCHEDULEID, SCHEDULEDAY,
        SCHEDULETIME, DOCTORID);
END;
```

   b. Purpose:
   The purpose of this stored procedure is to help modify the doctor schedule easily in order to prevent data anomalies such as delete anomalies and insertion anomalies, and avoid any further issues such as making appointments with the wrong doctors' schedule.

   c. Code to execute:
   EXEC CHANGESCHEDULE ('20011','MON','10:00','88001');

   d. Screenshot of Result after query execution:
      i. Before the procedure is compiled:

	SCHEDULE_ID	SCHEDULE_DAY	SCHEDULE_TIME	DOCTOR_ID
1	20011	MON	10:00	88002
2	20012	MON	15:00	88001
3	20013	TUE	10:00	88002
4	20014	TUE	15:00	88001
5	20015	WED	10:00	88002
6	20016	WED	15:00	88001
7	20017	THU	10:00	88002
8	20018	THU	15:00	88001
9	20019	FRI	10:00	88002
10	20020	FRI	15:00	88001
11	20021	SAT	10:00	88002
12	20022	SUN	10:00	88001

      ii. After execute the procedure:

	SCHEDULE_ID	SCHEDULE_DAY	SCHEDULE_TIME	DOCTOR_ID
1	20012	MON	15:00	88001
2	20013	TUE	10:00	88002
3	20014	TUE	15:00	88001
4	20015	WED	10:00	88002
5	20016	WED	15:00	88001
6	20017	THU	10:00	88002
7	20018	THU	15:00	88001
8	20019	FRI	10:00	88002
9	20020	FRI	15:00	88001
10	20021	SAT	10:00	88002
11	20022	SUN	10:00	88001
12	20011	MON	10:00	88001

      The Previous data for Monday,10:00 with doctor ID 88002 is deleted and replaced with new data which is Monday,10:00 with doctor ID 88001.

5. View
    a. Code:

```
CREATE VIEW PATIENT_IN_KULAI AS
        SELECT PATIENT_FNAME, PATIENT_LNAME,
        PATIENT_CONTACTNO, RECORD_DIAGNOSIS
                FROM PATIENT P, MEDICAL_RECORD M
                        WHERE P.PATIENT_ID = M.PATIENT_ID
                        AND PATIENT_ZIPCODE = '81000'
                                ORDER BY P.PATIENT_ID ASC;
```

    b. Purpose:
    The purpose of this view is to display the patient name who are from Kulai, along with the patient contact number, and their record diagnosis based on the patient's zip code.

    c. Screenshot of Result after query execution:

	PATIENT_FNAME	PATIENT_LNAME	PATIENT_CONTACTNO	RECORD_DIAGNOSIS
1	Safiyya Aliaa	Binti Abu Bakar	011-11235333	Food Poisoning
2	Washil	Al Ahdab	018-7546522	Circumcision

6. Use of Subqueries / nested queries
   a. Code :

```
SELECT SUM(BILL_FEE) AS TOTAL_BILL_LAST_7_DAYS FROM BILL
        WHERE SYSDATE - 7 <
                (SELECT PRESCRIPTION_DATE FROM PRESCRIPTION
        WHERE PRESCRIPTION_ID = BILL.PRESCRIPTION_ID);
```

   b. Purpose:
   The purpose of this function is to display the total bill fee in the last 7 days based on the system time.

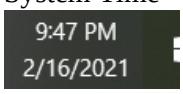
   c. Screenshot of Result after query execution:
      i. Prescription Table

	PRESCRIPTION_ID	PRESCRIPTION_DATE	APPOINTMENT_ID
1	99001	03-MAY-13	1
2	99002	01-OCT-13	2
3	99003	01-JAN-14	3
4	99004	24-AUG-15	4
5	99005	11-FEB-16	5
6	99006	03-MAR-16	6
7	99007	13-JUL-17	7
8	99008	21-AUG-17	8
9	99009	14-FEB-21	9
10	99010	15-FEB-21	10
11	99011	03-SEP-13	11

      ii. Bill Table

	BILL_ID	BILL_FEE	PRESCRIPTION_ID
1	B0001	10	99001
2	B0002	120	99002
3	B0003	9.5	99003
4	B0004	140	99004
5	B0005	138.6	99005
6	B0006	20.5	99006
7	B0007	90	99007
8	B0008	12	99008
9	B0009	5.95	99009
10	B0010	120	99010

      iii. System Time



      iv. Result

	TOTAL_BILL_LAST_7_DAYS
1	125.95

   Based on the prescription table and bill table shown above, only bills with BILL_ID B0009 and B0010 are in the latest 7 days regarding the above system time. Therefore,the total bill for the last 7 days is RM 125.95.

7. Queries not covered in lecture
    a. SEQUENCE
        i. Explanation of query:
            - SEQUENCE - A sequence is an object is used to generate a number sequence when you need to create a unique number to act as a primary key.

        ii. Code:

```
CREATE SEQUENCE SEQ_APPOINTMENT_ID
START WITH 1
INCREMENT BY 1
CACHE 10

CREATE TRIGGER INSERTION_TABLE_APPOINTMENT
BEFORE INSERT
ON APPOINTMENT
REFERENCING NEW AS NEW
FOR EACH ROW
BEGIN
        IF(:new.APPOINTMENT_ID IS NULL)THEN
        SELECT SEQ_APPOINTMENT_ID.NEXTVAL
        INTO :new.APPOINTMENT_ID
        FROM dual;
        END IF;
END;
```

        iii. Purpose:
        Create a sequence for Appointment_ID.Appointment_ID auto increment by 1 for every new row inserted for appointment.Therefore,when doing the insertion of new appointment no need to look back on the last appointment ID number.

        iv. Code to execute:

```
INSERT INTO
APPOINTMENT(APPOINTMENT_DATE,APPOINTMENT_DESCRIPTIO
N,DOCTOR_ID,PATIENT_ID) VALUES (TO_DATE('2020/06/20
10:00:44', 'yyyy/mm/dd hh24:mi:ss'),'Sore throat, cough','88002','00001');
```

v. Screenshot of Result after query execution:

- BEFORE

	APPOINTMEN...	APPOINTMENT_DATETIME	APPOINTMENT_DESCRIPTION	DOCTOR_ID	PATIENT_ID
1	1	03-MAY-13	Sore throat, cough	88002	00001
2	2	01-OCT-13	Possible tetanus from rust	88002	00002
3	3	01-JAN-14	Sore eye, dryness	88001	00003
4	4	24-AUG-15	Blister from burn	88001	00004
5	5	11-FEB-16	Dizzy, breathing difficulties	88002	00005
6	6	03-MAR-16	Severe headaches, chest pain	88002	00006
7	7	13-JUL-17	Run urinary test	88001	00007
8	8	21-AUG-17	Vomit, diarrhea, nausea	88001	00008
9	9	14-FEB-21	Cicumcision operation	88001	00009
10	10	15-FEB-21	Cholera vaccination	88002	00010
11	11	03-SEP-13	Sore throat, cough	88002	00001

- AFTER

	APPOINTMEN...	APPOINTMENT_DATETIME	APPOINTMENT_DESCRIPTION	DOCTOR_ID	PATIENT_ID
1	1	03-MAY-13	Sore throat, cough	88002	00001
2	2	01-OCT-13	Possible tetanus from rust	88002	00002
3	3	01-JAN-14	Sore eye, dryness	88001	00003
4	4	24-AUG-15	Blister from burn	88001	00004
5	5	11-FEB-16	Dizzy, breathing difficulties	88002	00005
6	6	03-MAR-16	Severe headaches, chest pain	88002	00006
7	7	13-JUL-17	Run urinary test	88001	00007
8	8	21-AUG-17	Vomit, diarrhea, nausea	88001	00008
9	9	14-FEB-21	Cicumcision operation	88001	00009
10	10	15-FEB-21	Cholera vaccination	88002	00010
11	11	03-SEP-13	Sore throat, cough	88002	00001
12	12	20-JUN-20	Sore throat, cough	88002	00001

The 12th row inserted into the APPOINTMENT table with the appointment ID 12 after the appointment id 11.

b. ROUND, ROLLUP, DBMS_RANDOM.VALUE(low,high)

i. Explanation of query:

- ROUND - round off a number to desired decimal places
- ROLLUP - extension of GROUP BY clause to include extra row that represent the grand total
- DBMS_RANDOM.VALUE(low,high) - generate random value within a range

ii. Code:

```
SELECT MEDICINE_ID, SUM(TREATMENT_DOSAGE *
ROUND(DBMS_RANDOM.VALUE(40,100) ) ) AS
RANDOM_MEDICINE_AMOUNT
        FROM TREATMENT
                INNER JOIN MEDICINE USING (MEDICINE_ID)
                        WHERE ROUND(MEDICINE_PRICE, 0)> 10
                                GROUP BY ROLLUP(MEDICINE_ID);
```

iii. Purpose:
To display the medicine id whose value in TREATMENT table is matching with MEDICINE table, and the medicine price after round off must be greater than 10. The query also counts the sum of the treatment dosage multiple with a round off random treatment period and then displays the roll up which is the grand total of the aggregate function.

iv. Screenshot of Result after query execution:

- select row that have same value

	MEDICINE_ID	MEDICINE_PRICE
1	22001	10
2	22002	1
3	22012	0.85
4	22013	2
5	22015	120
6	22022	3.3
7	22023	1.5
8	22025	4.1
9	22026	9.5
10	22028	120

- whereas among these row, only those row whose medicine_price round off is greater than 10, will be chosen to calculate the product of dosage and period

	MEDICINE_ID	SUM(TREATMENT_DOSAGE*ROUND(DBMS_RANDOM.VALUE(40,1...
1	22015	48
2	22028	87
3	(null)	135

The row with a NULL value in the medicine_id column denotes the grand total of the aggregate function.

c. OFFSET, FETCH

i. Explanation of query:

- OFFSET - specifies the number of rows to skip
- FETCH: specifies the number of rows to return

ii. Code:

```
SELECT PATIENT_ID, PATIENT_FNAME, PATIENT_LNAME,
PATIENT_CONTACTNO
        FROM PATIENT
                ORDER BY PATIENT_ID
                        OFFSET 3 ROWS FETCH FIRST 40 PERCENT
                        ROWS ONLY;
```

iii. Purpose:
To display 40 percent of rows of patient id, patient first name and patient last name starting from the fourth row in the PATIENT table.

iv. Screenshot of Result after query execution:

- skip the first 3 rows, fetch 40% of the total row in the PATIENT table. 10 rows times 0.4 equals to 4 rows which means fetching from row 4 to row 7

	PATIENT_ID	PATIENT_FNAME	PATIENT_LNAME	PATIENT_CONTACTNO
1	00004	Siti Aisyah	Binti Ahmed	013-8955566
2	00005	Kumar	Prashant	019-7858855
3	00006	Ujjwal	Sinha	011-11117521
4	00007	Theevashini	A/P Rajen	016-9856621

d. PIVOT

i. Explanation of query:

- PIVOT -- transpose rows into columns and aggregating data in the process of the transposing

ii. Code:

```
SELECT * FROM (SELECT PATIENT_GENDER, PATIENT_CITY
FROM PATIENT)
PIVOT(
        COUNT(*)
        FOR PATIENT_CITY
         N ('Johor Bahru','Kulai','Ulu Tiram')
);
```

iii. Purpose:
To convert the rows containing ‘Johor Bahru’, Kulai’, ‘Ulu Tiram’ into columns and display the frequency of patients living in these cities by gender.

iv. Screenshot of Result after query execution:

	PATIENT_GENDER	'Johor Bahru'	'Kulai'	'Ulu Tiram'
1	M	3	1	0
2	F	3	1	1

JOHOR BAHRU, KULAI, ULU TIRAM were originally data in a row, now they become column