Assignment 2A Sample Solution

```
SQL> --========================== START RUN =====================================---
SQL> -- Running mns_schema_insert.sql
SQL> set echo off
SQL> ------------- Task 1 Create Tables ----------------------------------------
SQL> @T1-mns-schema.sql
SQL> --*****PLEASE ENTER YOUR DETAILS BELOW*****
SQL> --T1-mns-schema.sql
SQL> -- SAMPLE SOLUTION
SQL>
SQL> --APPOINTMENT
SQL> CREATE TABLE appointment (
  2      appt_no           NUMBER(7) NOT NULL,
  3      appt_datetime     DATE NOT NULL,
  4      appt_roomno       NUMBER(2) NOT NULL,
  5      appt_length       CHAR(1) NOT NULL,
  6      patient_no        NUMBER(4) NOT NULL,
  7      provider_code     CHAR(6) NOT NULL,
  8      nurse_no          NUMBER(3) NOT NULL,
  9      appt_prior_apptno NUMBER(7)
 10  );

Table APPOINTMENT created.

SQL>
SQL> COMMENT ON COLUMN appointment.appt_no IS
  2      'Appointment identifier (surrogate PK)';

Comment created.

SQL>
SQL> COMMENT ON COLUMN appointment.appt_datetime IS
  2      'Date and time of appointment';

Comment created.

SQL>
SQL> COMMENT ON COLUMN appointment.appt_roomno IS
  2      'Room in which appointment is scheduled to take place';

Comment created.

SQL>
SQL> COMMENT ON COLUMN appointment.appt_length IS
  2      'Length of appointment - Short, Standard or Long (S, T or L)';

Comment created.

SQL>
SQL> COMMENT ON COLUMN appointment.patient_no IS
  2      'Patient who books the appointment';

Comment created.

SQL>
SQL> COMMENT ON COLUMN appointment.provider_code IS
  2      'Provider who is assigned to the appointment';
```

```
Comment created.

SQL>
SQL> COMMENT ON COLUMN appointment.nurse_no IS
  2      'Nurse who is assigned to the appointment';

Comment created.

SQL>
SQL> COMMENT ON COLUMN appointment.appt_prior_apptno IS
  2      'Prior appointment number which leads to the appointment';

Comment created.

SQL>
SQL> ALTER TABLE appointment ADD CONSTRAINT appointment_pk PRIMARY KEY ( appt_no );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment ADD CONSTRAINT appt_length_chk CHECK ( appt_length IN ( 'L', 'S', 'T' ) );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment ADD CONSTRAINT priorappt_uq UNIQUE ( appt_prior_apptno );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment ADD CONSTRAINT appointment_nk1 UNIQUE ( appt_datetime, patient_no );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment ADD CONSTRAINT appointment_nk2 UNIQUE ( provider_code,appt_datetime );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment ADD CONSTRAINT appointment_nk3 UNIQUE ( appt_datetime,appt_roomno );

Table APPOINTMENT altered.

SQL>
SQL> --EMERGENCY CONTACT
SQL>
SQL> CREATE TABLE emergency_contact (
  2      ec_id    NUMBER(4) NOT NULL,
  3      ec_fname VARCHAR2(30),
  4      ec_lname VARCHAR2(30),
  5      ec_phone CHAR(10) NOT NULL
  6  );

Table EMERGENCY_CONTACT created.
```

```
SQL>
SQL> COMMENT ON COLUMN emergency_contact.ec_id IS
  2      'Emergency contact identifier';

Comment created.

SQL>
SQL> COMMENT ON COLUMN emergency_contact.ec_fname IS
  2      'Emergency contact first name';

Comment created.

SQL>
SQL> COMMENT ON COLUMN emergency_contact.ec_lname IS
  2      'Emergency contact last name';

Comment created.

SQL>
SQL> COMMENT ON COLUMN emergency_contact.ec_phone IS
  2      'Emergency contact phone number';

Comment created.

SQL>
SQL> ALTER TABLE emergency_contact ADD CONSTRAINT emergency_contact_pk PRIMARY KEY ( ec_id );

Table EMERGENCY_CONTACT altered.

SQL>
SQL> ALTER TABLE emergency_contact ADD CONSTRAINT emergency_contact_nk UNIQUE ( ec_phone );

Table EMERGENCY_CONTACT altered.

SQL>
SQL>
SQL> --PATIENT
SQL>
SQL> CREATE TABLE patient (
  2      patient_no            NUMBER(4) NOT NULL,
  3      patient_fname         VARCHAR2(30),
  4      patient_lname         VARCHAR2(30),
  5      patient_street        VARCHAR2(50) NOT NULL,
  6      patient_city          VARCHAR2(20) NOT NULL,
  7      patient_state         VARCHAR2 (3) NOT NULL,
  8      patient_postcode      CHAR(4) NOT NULL,
  9      patient_dob           DATE NOT NULL,
 10      patient_contactmobile CHAR(10) NOT NULL,
 11      patient_contactemail  VARCHAR2(25) NOT NULL,
 12      ec_id                 NUMBER(4) NOT NULL
 13  );

Table PATIENT created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_no IS
  2      'Patient number (identifier)';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_fname IS
  2      'Patient first name';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_lname IS
  2      'Patient last name';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_street IS
  2      'Patient residential street address';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_city IS
  2      'Patient residential city';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_state IS
  2      'Patient residential state - NT, QLD, NSW, ACT, VIC, TAS, SA, or WA';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_postcode IS
  2      'Patient residential postcode';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_dob IS
  2      'Patient date of birth';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_contactmobile IS
  2      'Patient contact mobile number';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.patient_contactemail IS
  2      'Patient contact email address';
```

```
Comment created.

SQL>
SQL> COMMENT ON COLUMN patient.ec_id IS
  2      'Emergency contact identifier';

Comment created.

SQL>
SQL> ALTER TABLE patient
  2      ADD CONSTRAINT patient_state_chk CHECK
  3      ( patient_state IN ( 'VIC','ACT', 'NSW', 'NT', 'QLD', 'SA', 'TAS', 'WA' ) );

Table PATIENT altered.

SQL>
SQL> ALTER TABLE patient ADD CONSTRAINT patient_pk PRIMARY KEY ( patient_no );

Table PATIENT altered.

SQL>
SQL> --ALL FKs
SQL>
SQL> ALTER TABLE patient
  2      ADD CONSTRAINT emercontact_patient_fk FOREIGN KEY ( ec_id )
  3          REFERENCES emergency_contact ( ec_id );

Table PATIENT altered.

SQL>
SQL> ALTER TABLE appointment
  2      ADD CONSTRAINT apptmnt_followupappmnt_fk FOREIGN KEY ( appt_prior_apptno )
  3          REFERENCES appointment ( appt_no );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment
  2      ADD CONSTRAINT nurse_appointment_fk FOREIGN KEY ( nurse_no )
  3          REFERENCES nurse ( nurse_no );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment
  2      ADD CONSTRAINT patient_appointment_fk FOREIGN KEY ( patient_no )
  3          REFERENCES patient ( patient_no );

Table APPOINTMENT altered.

SQL>
SQL> ALTER TABLE appointment
  2      ADD CONSTRAINT provider_appointment_fk FOREIGN KEY ( provider_code )
  3          REFERENCES provider ( provider_code );
```

```
Table APPOINTMENT altered.

SQL>
SQL> ------------- EMERGENCY_CONTACT ----------------------------------
SQL> describe EMERGENCY_CONTACT
Name     Null?    Type
-------- -------- ------------
EC_ID    NOT NULL NUMBER(4)
EC_FNAME          VARCHAR2(30)
EC_LNAME          VARCHAR2(30)
EC_PHONE NOT NULL CHAR(10)
SQL> ------------- PATIENT --------------------------------------------
SQL> describe PATIENT
Name                  Null?    Type
--------------------- -------- ------------
PATIENT_NO            NOT NULL NUMBER(4)
PATIENT_FNAME                  VARCHAR2(30)
PATIENT_LNAME                  VARCHAR2(30)
PATIENT_STREET        NOT NULL VARCHAR2(50)
PATIENT_CITY          NOT NULL VARCHAR2(20)
PATIENT_STATE         NOT NULL VARCHAR2(3)
PATIENT_POSTCODE      NOT NULL CHAR(4)
PATIENT_DOB           NOT NULL DATE
PATIENT_CONTACTMOBILE NOT NULL CHAR(10)
PATIENT_CONTACTEMAIL  NOT NULL VARCHAR2(25)
EC_ID                 NOT NULL NUMBER(4)
SQL> ------------- APPOINTMENT ---------------------------------------
SQL> describe APPOINTMENT
Name              Null?    Type
----------------- -------- ---------
APPT_NO           NOT NULL NUMBER(7)
APPT_DATETIME     NOT NULL DATE
APPT_ROOMNO       NOT NULL NUMBER(2)
APPT_LENGTH       NOT NULL CHAR(1)
PATIENT_NO        NOT NULL NUMBER(4)
PROVIDER_CODE     NOT NULL CHAR(6)
NURSE_NO          NOT NULL NUMBER(3)
APPT_PRIOR_APPTNO          NUMBER(7)
SQL>
SQL> ------------- CONSTRAINTS DECLARED ---------------------------
SQL> set echo off

CONSTRAINT_NAME                CONSTRAINT_ TABLE_NAME                     SEARCH_CONDITION
------------------------------ ----------- ------------------------------ ------------------------------------------------------------------
--------------
APPOINTMENT_NK2                Unique      APPOINTMENT
APPOINTMENT_NK1                Unique      APPOINTMENT
PRIORAPPT_UQ                   Unique      APPOINTMENT
APPOINTMENT_NK3                Unique      APPOINTMENT
APPOINTMENT_PK                 Primary Key APPOINTMENT
PROVIDER_APPOINTMENT_FK        Foreign Key APPOINTMENT
PATIENT_APPOINTMENT_FK         Foreign Key APPOINTMENT
NURSE_APPOINTMENT_FK           Foreign Key APPOINTMENT
APPTMNT_FOLLOWUPAPPMNT_FK      Foreign Key APPOINTMENT
SYS_C00108906                  Check       APPOINTMENT                    "PATIENT_NO" IS NOT NULL
SYS_C00108907                  Check       APPOINTMENT                    "PROVIDER_CODE" IS NOT NULL
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SYS_C00108908                  Check       APPOINTMENT                    "NURSE_NO" IS NOT NULL
APPT_LENGTH_CHK                Check       APPOINTMENT                     appt_length IN ( 'L', 'S', 'T' )
SYS_C00108904                  Check       APPOINTMENT                    "APPT_ROOMNO" IS NOT NULL
SYS_C00108903                  Check       APPOINTMENT                    "APPT_DATETIME" IS NOT NULL
SYS_C00108902                  Check       APPOINTMENT                    "APPT_NO" IS NOT NULL
SYS_C00108905                  Check       APPOINTMENT                    "APPT_LENGTH" IS NOT NULL
EMERGENCY_CONTACT_NK           Unique      EMERGENCY_CONTACT
EMERGENCY_CONTACT_PK           Primary Key EMERGENCY_CONTACT
SYS_C00108915                  Check       EMERGENCY_CONTACT              "EC_ID" IS NOT NULL
SYS_C00108916                  Check       EMERGENCY_CONTACT              "EC_PHONE" IS NOT NULL
PATIENT_PK                     Primary Key PATIENT
EMERCONTACT_PATIENT_FK         Foreign Key PATIENT
SYS_C00108927                  Check       PATIENT                        "EC_ID" IS NOT NULL
PATIENT_STATE_CHK              Check       PATIENT                         patient_state IN ( 'VIC','ACT', 'NSW', 'NT', 'QLD', 'SA', 'TAS',
'WA' )
SYS_C00108920                  Check       PATIENT                        "PATIENT_STREET" IS NOT NULL
SYS_C00108919                  Check       PATIENT                        "PATIENT_NO" IS NOT NULL
SYS_C00108926                  Check       PATIENT                        "PATIENT_CONTACTEMAIL" IS NOT NULL
SYS_C00108925                  Check       PATIENT                        "PATIENT_CONTACTMOBILE" IS NOT NULL
SYS_C00108924                  Check       PATIENT                        "PATIENT_DOB" IS NOT NULL
SYS_C00108921                  Check       PATIENT                        "PATIENT_CITY" IS NOT NULL
SYS_C00108922                  Check       PATIENT                        "PATIENT_STATE" IS NOT NULL
SYS_C00108923                  Check       PATIENT                        "PATIENT_POSTCODE" IS NOT NULL

33 rows selected.

SQL> ------------- Task 2 Load Student Data  ------------------------------------
SQL> @T2-mns-insert.sql
SQL> --*****PLEASE ENTER YOUR DETAILS BELOW*****
SQL> --T2-mns-insert.sql
SQL> --Emergency Contact
SQL> -- Sample Solution
SQL>
SQL> INSERT INTO emergency_contact VALUES (
  2      1,
  3      'Sarah',
  4      'Johnson',
  5      '0446129124'
  6  );

1 row inserted.

SQL>
SQL> INSERT INTO emergency_contact VALUES (
  2      2,
  3      'Elizabeth',
  4      NULL,
  5      '0345779594'
  6  );

1 row inserted.

SQL>
SQL> INSERT INTO emergency_contact VALUES (
  2      3,
  3      'Alexander',
  4      'Soares',
  5      '0482120455'
  6  );

1 row inserted.

SQL>
SQL> INSERT INTO emergency_contact VALUES (
  2      4,
  3      'Andrew',
  4      'Hansman',
  5      '0395333172'
  6  );

1 row inserted.

SQL>
SQL> INSERT INTO emergency_contact VALUES (
  2      5,
  3      NULL,
  4      'Bayldon',
  5      '049095805'
  6  );

1 row inserted.

SQL>
SQL> INSERT INTO emergency_contact VALUES (
  2      6,
  3      'Mira',
  4      'Hansman',
  5      '0493536124'
  6  );

1 row inserted.

SQL>
SQL> --Patient
SQL> INSERT INTO patient VALUES (
  2      1,
  3      'Jake',
  4      'Auld',
  5      '46 Glen William Road',
  6      'Blackburn',
  7      'VIC',
  8      '3130',
  9      TO_DATE('24/APR/1967', 'dd/MON/yyyy'),
 10      '0482848702',
 11      'JakeAuld@hourapid.com',
 12      1
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      2,
  3      NULL,
  4      'Roberts',
  5      'Unit 3, 13 Moruya Road',
  6      'Mooroolbark',
  7      'VIC',
  8      '3138',
  9      TO_DATE('04/APR/1996', 'dd/MON/yyyy'),
 10      '0461643245',
 11      'BrookeRoberts@spi.com',
 12      2
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      3,
  3      'Darcy',
  4      NULL,
  5      '18 Farnell Street',
  6      'Warrandyte',
  7      'VIC',
  8      '3113',
  9      TO_DATE('03/MAY/1951', 'dd/MON/yyyy'),
 10      '0440814836',
 11      'DSoares71@hour.com',
 12      3
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      4,
  3      'Marie-Rose',
  4      'Johnson',
  5      '46 Glen William Road',
  6      'Blackburn',
  7      'VIC',
  8      '3130',
  9      TO_DATE('28/JUN/2010', 'dd/MON/yyyy'),
 10      '0446129124',
 11      'Johnsons@klog.com',
 12      1
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      5,
  3      'Sally',
  4      'Johnson',
  5      '46 Glen William Road',
  6      'Blackburn',
  7      'VIC',
  8      '3130',
  9      TO_DATE('31/JAN/2013', 'dd/MON/yyyy'),
 10      '0446129124',
 11      'Johnsons@klog.com',
 12      1
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      6,
  3      'Gemma',
  4      'Hansman',
  5      '37 Bayview Road',
  6      'Tyringa',
  7      'SA',
  8      '5671',
  9      TO_DATE('03/MAR/1980', 'dd/MON/yyyy'),
 10      '0487186889',
 11      'GemmaHansman@reefblue.com',
 12      4
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      7,
  3      'Charli',
  4      'Hansman',
  5      '37 Bayview Road',
  6      'Tyringa',
  7      'SA',
  8      '5671',
  9      TO_DATE('03/DEC/2015', 'dd/MON/yyyy'),
 10      '0487186889',
 11      'GemmaHansman@reefblue.com',
 12      4
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      8,
  3      'Alice',
  4      'Bayldon',
  5      '33 Sunset Drive',
  6      'Saint Helena',
  7      'VIC',
  8      '3088',
  9      TO_DATE('09/NOV/2016', 'dd/MON/yyyy'),
 10      '0449724439',
 11      'Bayldons@redkite.com.au',
 12      5
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      9,
  3      'Ashley',
  4      'Soares',
  5      '14 Davis Street',
  6      'Donvale',
  7      'VIC',
  8      '3111',
  9      TO_DATE('16/MAY/1975', 'dd/MON/yyyy'),
 10      '0440814836',
 11      'Ashley4173@kmpl.org',
 12      3
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      10,
  3      'Imogen',
  4      NULL,
  5      '38 Mandible Street',
  6      'Yellingbo',
  7      'VIC',
  8      '3139',
  9      TO_DATE('16/JUN/2014', 'dd/MON/yyyy'),
 10      '0445070410',
 11      'ImoHan@raindrop.com.au',
 12      6
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      11,
  3      'Anthony',
  4      'Raggatt',
  5      '51 Ghost Hill Road',
  6      'Kalkallo',
  7      'VIC',
  8      '3064',
  9      TO_DATE('05/APR/1997', 'dd/MON/yyyy'),
 10      '0447793731',
 11      'ARaggat@ylkie.com',
 12      3
 13  );

1 row inserted.
```

```
SQL>
SQL> INSERT INTO patient VALUES (
  2      12,
  3      'Lincoln',
  4      'Hansman',
  5      '38 Mandible Street',
  6      'Yellingbo',
  7      'VIC',
  8      '3139',
  9      TO_DATE('10/SEP/1972', 'dd/MON/yyyy'),
 10      '0462975870',
 11      'Lincoln@raindrop.com.au',
 12      6
 13  );

1 row inserted.

SQL>
SQL> --Appointment
SQL> INSERT INTO appointment VALUES (
  2      1,
  3      TO_DATE('08/AUG/2023 10:00', 'dd/MON/yyyy hh24:mi'),
  4      5,
  5      'L',
  6      1,
  7      'ORS001',
  8      1,
  9      NULL
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      2,
  3      TO_DATE('08/AUG/2023 10:00', 'dd/MON/yyyy hh24:mi'),
  4      3,
  5      'S',
  6      2,
  7      'GEN002',
  8      2,
  9      NULL
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      3,
  3      TO_DATE('08/AUG/2023 12:00', 'dd/MON/yyyy hh24:mi'),
  4      5,
  5      'L',
  6      3,
  7      'ORS001',
  8      9,
  9      NULL
```

```
      );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
            4,
            TO_DATE('08/AUG/2023 15:00', 'dd/MON/yyyy hh24:mi'),
            2,
            'T',
            4,
            'GEN001',
            7,
            NULL
      );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
            5,
            TO_DATE('08/AUG/2023 16:00', 'dd/MON/yyyy hh24:mi'),
            2,
            'T',
            5,
            'GEN001',
            7,
            NULL
      );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
            6,
            TO_DATE('08/AUG/2023 11:00', 'dd/MON/yyyy hh24:mi'),
            4,
            'T',
            6,
            'GEN003',
            5,
            NULL
      );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
            7,
            TO_DATE('08/AUG/2023 12:00', 'dd/MON/yyyy hh24:mi'),
            4,
            'T',
            7,
            'GEN003',
            5,
            NULL
```

```
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      8,
  3      TO_DATE('08/AUG/2023 12:00', 'dd/MON/yyyy hh24:mi'),
  4      1,
  5      'L',
  6      8,
  7      'END001',
  8      3,
  9      NULL
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      9,
  3      TO_DATE('11/AUG/2023 15:00', 'dd/MON/yyyy hh24:mi'),
  4      5,
  5      'S',
  6      1,
  7      'ORS001',
  8      1,
  9      1
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      10,
  3      TO_DATE('11/AUG/2023 9:15', 'dd/MON/yyyy hh24:mi'),
  4      12,
  5      'T',
  6      9,
  7      'PER002',
  8      4,
  9      NULL
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      11,
  3      TO_DATE('11/AUG/2023 15:00', 'dd/MON/yyyy hh24:mi'),
  4      7,
  5      'L',
  6      10,
  7      'PED002',
  8      8,
  9      NULL
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      12,
  3      TO_DATE('14/AUG/2023 10:00', 'dd/MON/yyyy hh24:mi'),
  4      5,
  5      'S',
  6      1,
  7      'ORS001',
  8      1,
  9      9
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      13,
  3      TO_DATE('14/AUG/2023 10:00', 'dd/MON/yyyy hh24:mi'),
  4      11,
  5      'L',
  6      11,
  7      'PER001',
  8      4,
  9      NULL
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      14,
  3      TO_DATE('14/AUG/2023 14:00', 'dd/MON/yyyy hh24:mi'),
  4      1,
  5      'T',
  6      8,
  7      'END001',
  8      3,
  9      8
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      15,
  3      TO_DATE('14/AUG/2023 9:00', 'dd/MON/yyyy hh24:mi'),
  4      6,
  5      'S',
  6      10,
  7      'PED001',
  8      8,
  9      11
 10  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      16,
  3      TO_DATE('14/AUG/2023 10:30', 'dd/MON/yyyy hh24:mi'),
  4      4,
  5      'S',
  6      12,
  7      'GEN003',
  8      7,
  9      NULL
 10  );

1 row inserted.

SQL>
SQL> COMMIT;

Commit complete.

SQL>
SQL> set echo on
SQL> -- Check INSERT Count
SQL> ---------------------
SQL> set echo off

Table                Rows inserted Requirement Met
-------------------- ------------- ----------------------------
1. EMERGENCY_CONTACT             6 Requirement (5 entries) Met
2. PATIENT                      12 Requirement (10 entries) Met
3. APPOINTMENT                  16 Requirement (15 entries) Met

SQL> -- EXPLICIT checks
SQL> ------------------------------------------------
SQL> -- PKs used - must be under 100 and not a sequence
SQL> set echo off

PK_ABOVE_100
------------
           0

SQL> -- Check INSERT Data - Data must mimic real data
SQL> set echo off
SQL> -- EMERGENCY_CONTACT
SQL> set echo off

     EC_ID EC_FNAME                      EC_LNAME                       EC_PHONE
---------- ------------------------------ ------------------------------ ----------
         1 Sarah                          Johnson                        0446129124
         2 Elizabeth                                                     0345779594
         3 Alexander                      Soares                         0482120455
         4 Andrew                         Hansman                        0395333172
         5                                Bayldon                        049095805
         6 Mira                           Hansman                        0493536124

6 rows selected.

SQL> -- PATIENT
SQL> set echo off

PATIENT_NO PATIENT_FNAME                  PATIENT_LNAME                  PATIENT_STREET                                     PATIENT_CITY
     PAT PATI DATEOFBIRTH          PATIENT_CO PATIENT_CONTACTEMAIL           EC_ID
---------- ------------------------------ ------------------------------ -------------------------------------------------- ----------------
---- --- ---- -------------------- ---------- ------------------------- ----------
         1 Jake                           Auld                           46 Glen William Road                               Blackburn
     VIC 3130 24-Apr-1967          0482848702 JakeAuld@hourapid.com              1
         2                                Roberts                        Unit 3, 13 Moruya Road                             Mooroolbark
     VIC 3138 04-Apr-1996          0461643245 BrookeRoberts@spi.com              2
         3 Darcy                                                         18 Farnell Street                                  Warrandyte
     VIC 3113 03-May-1951          0440814836 DSoares71@hour.com                 3
         4 Marie-Rose                     Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 28-Jun-2010          0446129124 Johnsons@klog.com                  1
         5 Sally                          Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 31-Jan-2013          0446129124 Johnsons@klog.com                  1
         6 Gemma                          Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03-Mar-1980          0487186889 GemmaHansman@reefblue.com          4
         7 Charli                         Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03-Dec-2015          0487186889 GemmaHansman@reefblue.com          4
         8 Alice                          Bayldon                        33 Sunset Drive                                    Saint Helena
     VIC 3088 09-Nov-2016          0449724439 Bayldons@redkite.com.au            5
         9 Ashley                         Soares                         14 Davis Street                                    Donvale
     VIC 3111 16-May-1975          0440814836 Ashley4173@kmpl.org                3
        10 Imogen                                                        38 Mandible Street                                 Yellingbo
     VIC 3139 16-Jun-2014          0445070410 ImoHan@raindrop.com.au             6
        11 Anthony                        Raggatt                        51 Ghost Hill Road                                 Kalkallo
     VIC 3064 05-Apr-1997          0447793731 ARaggat@ylkie.com                  3
        12 Lincoln                        Hansman                        38 Mandible Street                                 Yellingbo
     VIC 3139 10-Sep-1972          0462975870 Lincoln@raindrop.com.au            6

12 rows selected.

SQL> -- APPOINTMENT
SQL> set echo off

   APPT_NO APPDATETIME                APPT_ROOMNO A PATIENT_NO PROVID   NURSE_NO APPT_PRIOR_APPTNO
---------- -------------------------- ----------- - ---------- ------ ---------- -----------------
         1 08-Aug-2023 10:00                    5 L          1 ORS001          1
         2 08-Aug-2023 10:00                    3 S          2 GEN002          2
         3 08-Aug-2023 12:00                    5 L          3 ORS001          9
         4 08-Aug-2023 15:00                    2 T          4 GEN001          7
         5 08-Aug-2023 16:00                    2 T          5 GEN001          7
         6 08-Aug-2023 11:00                    4 T          6 GEN003          5
         7 08-Aug-2023 12:00                    4 T          7 GEN003          5
         8 08-Aug-2023 12:00                    1 L          8 END001          3
         9 11-Aug-2023 15:00                    5 S          1 ORS001          1                 1
        10 11-Aug-2023 09:15                   12 T          9 PER002          4
        11 11-Aug-2023 15:00                    7 L         10 PED002          8
        12 14-Aug-2023 10:00                    5 S          1 ORS001          1                 9
        13 14-Aug-2023 10:00                   11 L         11 PER001          4
        14 14-Aug-2023 14:00                    1 T          8 END001          3                 8
        15 14-Aug-2023 09:00                    6 S         10 PED001          8                11
        16 14-Aug-2023 10:30                    4 S         12 GEN003          7

16 rows selected.

SQL> -- EXPLICIT checks
SQL> set echo off
SQL> -- EMERGENCY CONTACTs
SQL> -- Checking "Involve at least 2 people being the emergency contact for more than two patients"
SQL> set echo off

     EC_ID EC_FNAME                       EC_LNAME                       PATIENTCOUNT
---------- ------------------------------ ------------------------------ ------------
         5                                Bayldon                                   1
         2 Elizabeth                                                                1
         4 Andrew                         Hansman                                   2
         6 Mira                           Hansman                                   2
         3 Alexander                      Soares                                    3
         1 Sarah                          Johnson                                   3

6 rows selected.


CONTACT4MORETHAN2
--------------------------
Requirement Met

SQL> -- PATIENT types
SQL> -- Checking "Involve at least 5 adult patients and 5 under age (under 18 years old) patients"
SQL> set echo off

PATIENT_NO        AGE
---------- ----------
         8          6
         7          7
        10          9
         5         10
         4         13
        11         26
         2         27
         6         43
         9         48
        12         51
         1         56
         3         72

12 rows selected.

SQL> -- "Involve at least 5 adult patients aged >= 18"
SQL> set echo off

ADULTPATIENTS
----------------------------------------
Adult patient Requirement met
```

```
SQL> -- "Involve at least 5 under age patients aged < 18"
SQL> set echo off

UNDERAGE
--------------------------------------------
Under age patient requirement met

SQL> -- APPOINTMENT checks
SQL> -- Checking "All appointments must be scheduled on three days in 2023"
SQL> set echo off

NODAYSUSED
----------------------------------------------------------
Three specific appointment days requirement met

SQL> -- Checking "Involve some parallel appointments"
SQL> set echo off

PARALLELSETS CRITERIA
------------ -----------------------------------------------------
           4 Some parallel appointments requirement met

SQL> -- Checking "Involve at least 5 different providers"
SQL> set echo off

NOPROVIDERS CRITERIA
----------- -----------------------------------------------------------------
          9 Involve at least 5 different providers requirement met

SQL> -- Checking "Involve at least 5 different nurses"
SQL> set echo off

  NONURSES CRITERIA
---------- --------------------------------------------------------------
         8 Involve at least 5 different nurses requirement met

SQL> -- Checking "Involve at least 3 follow up appointments"
SQL> set echo off

NOFOLLOWUPS CRITERIA
----------- --------------------------------------------------------------------
          4 Involve at least 3 follow up appointments requirement met

SQL> -- Checking "the patient, provider, nurse and room must not be double booked"
SQL> set echo off

OVERLAP_BOOKINGS
---------------------------------------
No nurse booking overlaps
No provider booking overlaps
No room booking overlaps

SQL> ------------- Student Data replaced with marking data ---------------------
SQL> ---------------------- Task 3 DML -----------------------------------------
SQL> @T3-mns-dm.sql
SQL> --*****PLEASE ENTER YOUR DETAILS BELOW*****
SQL> --T3-mns-dm.sql
SQL> -- Sample Solution
SQL>
SQL> --3(a)
SQL> DROP SEQUENCE ec_seq;

Error starting at line : 6 File @ Ass2A/SampleSoln/Run/T3-mns-dm.sql
In command -
DROP SEQUENCE ec_seq
Error report -
ORA-02289: sequence does not exist
02289. 00000 -  "sequence does not exist"
*Cause:    The specified sequence does not exist, or the user does
           not have the required privilege to perform this operation.
*Action:   Make sure the sequence name is correct, and that you have
           the right to perform the desired operation on this sequence.
SQL>
SQL> CREATE SEQUENCE ec_seq START WITH 100 INCREMENT BY 5;

Sequence EC_SEQ created.

SQL>
SQL> DROP SEQUENCE patient_seq;

Error starting at line : 10 File @ Ass2A/SampleSoln/Run/T3-mns-dm.sql
In command -
DROP SEQUENCE patient_seq
Error report -
ORA-02289: sequence does not exist
02289. 00000 -  "sequence does not exist"
*Cause:    The specified sequence does not exist, or the user does
           not have the required privilege to perform this operation.
*Action:   Make sure the sequence name is correct, and that you have
           the right to perform the desired operation on this sequence.
SQL>
SQL> CREATE SEQUENCE patient_seq START WITH 100 INCREMENT BY 5;

Sequence PATIENT_SEQ created.

SQL>
SQL> DROP SEQUENCE appt_seq;

Error starting at line : 14 File @ Ass2A/SampleSoln/Run/T3-mns-dm.sql
In command -
DROP SEQUENCE appt_seq
Error report -
ORA-02289: sequence does not exist
02289. 00000 -  "sequence does not exist"
*Cause:    The specified sequence does not exist, or the user does
           not have the required privilege to perform this operation.
*Action:   Make sure the sequence name is correct, and that you have
           the right to perform the desired operation on this sequence.
SQL>
SQL> CREATE SEQUENCE appt_seq START WITH 100 INCREMENT BY 5;

Sequence APPT_SEQ created.
```

Task 3 - Note for the following tasks, subqueries can make use of any suitable CK's

```
SQL>
SQL> --3(b)
SQL> INSERT INTO emergency_contact VALUES (
  2      ec_seq.NEXTVAL,
  3      'Jonathan',
  4      'Robey',
  5      '0412523122'
  6  );

1 row inserted.

SQL>
SQL> -- allow last name as null or as Robey
SQL> INSERT INTO patient VALUES (
  2      patient_seq.NEXTVAL,
  3      'Laura',
  4      NULL,
  5      '66 Black Point Drive',
  6      'Clayton',
  7      'VIC',
  8      '3168',
  9      TO_DATE('13/APR/2011', 'dd/MON/yyyy'),
 10      '0412523122',
 11      'RobeyFam@gmail.com',
 12      ec_seq.CURRVAL
 13  );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
  2      appt_seq.NEXTVAL,
  3      TO_DATE('04/SEP/2023 3:30PM', 'dd/MON/yyyy hh:miAM'),
  4      2, --allow subquery to get the room_no
  5      'S',
  6      patient_seq.CURRVAL,
  7      (
  8          SELECT
  9              provider_code
 10          FROM
 11              provider
 12          WHERE
 13                  upper(provider_title) = upper('Dr')
 14              AND upper(provider_fname) = upper('Bruce')
 15              AND upper(provider_lname) = 'STRIPLIN'
 16      ),
 17      6,
 18      NULL
 19  );

1 row inserted.

SQL>
SQL> INSERT INTO patient VALUES (
  2      patient_seq.NEXTVAL,
         'Lachlan',
         NULL,
         '66 Black Point Drive',
         'Clayton',
         'VIC',
         '3168',
         TO_DATE('25/JUL/2014', 'dd/MON/yyyy'),
         '0412523122',
         'RobeyFam@gmail.com',
         ec_seq.CURRVAL
     );

1 row inserted.

SQL>
SQL> INSERT INTO appointment VALUES (
         appt_seq.NEXTVAL,
         TO_DATE('04/SEP/2023 4:00PM', 'dd/MON/yyyy hh:miAM'),
         2, --allow subquery to get the room_no
         'S',
         patient_seq.CURRVAL,
         (
             SELECT
                 provider_code
             FROM
                 provider
             WHERE
                     upper(provider_title) = upper('Dr')
                 AND upper(provider_fname) = upper('Bruce')
                 AND upper(provider_lname) = 'STRIPLIN'
         ),
         6,
         NULL
     );

1 row inserted.

SQL>
SQL> COMMIT;

Commit complete.

SQL>
SQL> --3(c)
SQL> INSERT INTO appointment VALUES (
         appt_seq.NEXTVAL,
         TO_DATE('04/SEP/2023 04:00PM', 'dd/MON/yyyy hh:miAM') + 10,
         2,  --allow subquery to get the room_no
         'S', --this can be any type of appointment
         (
             SELECT
                 patient_no
             FROM
                      patient
                 NATURAL JOIN emergency_contact
             WHERE
```

```
 13                    upper(patient_fname) = upper('Lachlan')
 14                AND ec_phone = '0412523122'
 15        ),
 16        (
 17            SELECT
 18                provider_code
 19            FROM
 20                provider
 21            WHERE
 22                    upper(provider_title) = upper('Dr')
 23                AND upper(provider_fname) = upper('Bruce')
 24                AND upper(provider_lname) = 'STRIPLIN'
 25        ),
 26        14,
 27        (
 28            SELECT
 29                appt_no
 30            FROM
 31                appointment
 32            WHERE
 33                    patient_no = (
 34                        SELECT
 35                            patient_no
 36                        FROM
 37                                 patient
 38                            NATURAL JOIN emergency_contact
 39                        WHERE
 40                                upper(patient_fname) = upper('Lachlan')
 41                            AND ec_phone = '0412523122'
 42                    )
 43                AND appt_datetime = TO_DATE('04/SEP/2023 04:00PM', 'dd/MON/yyyy hh:miAM')
 44        )
 45    );

1 row inserted.

SQL>
SQL> COMMIT;

Commit complete.

SQL>
SQL> --3(d)
SQL> UPDATE appointment
  2  SET
  3      appt_datetime = TO_DATE('04/SEP/2023 04:00PM', 'dd/MON/yyyy hh:miAM') + 14
  4  WHERE
  5          patient_no = (
  6              SELECT
  7                  patient_no
  8              FROM
  9                       patient
 10                  NATURAL JOIN emergency_contact
 11              WHERE
 12                      upper(patient_fname) = upper('Lachlan')
 13                  AND ec_phone = '0412523122'
 14          )
 15      AND appt_datetime = TO_DATE('04/SEP/2023 04:00PM', 'dd/MON/yyyy hh:miAM') + 10;

1 row updated.

SQL>
SQL> COMMIT;

Commit complete.

SQL>
SQL> --3e
SQL> DELETE FROM appointment
  2  WHERE
  3          provider_code = (
  4              SELECT
  5                  provider_code
  6              FROM
  7                  provider
  8              WHERE
  9                  upper(provider_title) = upper('Dr')
 10              AND upper(provider_fname) = upper('Bruce')
 11              AND upper(provider_lname) = 'STRIPLIN'
 12          )
 13      AND ( appt_datetime BETWEEN TO_DATE('15/SEP/2023 12:00AM', 'dd/MON/yyyy hh:miAM')
 14      AND TO_DATE('22/SEP/2023 11:59PM', 'dd/MON/yyyy hh:miAM') );

1 row deleted.

SQL>
SQL> COMMIT;

Commit complete.

SQL>
SQL> set echo on
SQL> -- Checking "EMERGENCY_CONTACT"
SQL> set echo off

     EC_ID EC_FNAME                       EC_LNAME                       EC_PHONE
---------- ------------------------------ ------------------------------ ----------
       100 Jonathan                       Robey                          0412523122
         6 Mira                           Hansman                        0493536124
         5                                Bayldon                        049095805
         4 Andrew                         Hansman                        0395333172
         3 Alexander                      Soares                         0482120455
         2 Elizabeth                                                     0345779594
         1 Sarah                          Johnson                        0446129124

7 rows selected.

SQL> -- Checking "PATIENT"
SQL> set echo off

PATIENT_NO PATIENT_FNAME                  PATIENT_LNAME                  PATIENT_STREET                                    PATIENT_CITY
     PAT PATI PDATEBIRTH           PATIENT_CO PATIENT_CONTACTEMAIL            EC_ID
```

```
---------- ------------------------------ ------------------------------ -------------------------------------------------- ----------------
---- --- ---- -------------------- ---------- ------------------------- ----------
       105 Lachlan                                                       66 Black Point Drive                               Clayton
     VIC 3168 25-Jul-2014          0412523122 RobeyFam@gmail.com               100
       100 Laura                                                         66 Black Point Drive                               Clayton
     VIC 3168 13-Apr-2011          0412523122 RobeyFam@gmail.com               100
        12 Lincoln                        Hansman                        38 Mandible Street                                 Yellingbo
     VIC 3139 10-Sep-1972          0462975870 Lincoln@raindrop.com.au            6
        11 Anthony                        Raggatt                        51 Ghost Hill Road                                 Kalkallo
     VIC 3064 05-Apr-1997          0447793731 ARaggat@ylkie.com                  3
        10 Imogen                                                        38 Mandible Street                                 Yellingbo
     VIC 3139 16-Jun-2014          0445070410 ImoHan@raindrop.com.au             6
         9 Ashley                         Soares                         14 Davis Street                                    Donvale
     VIC 3111 16-May-1975          0440814836 Ashley4173@kmpl.org                3
         8 Alice                          Bayldon                        33 Sunset Drive                                    Saint Helena
     VIC 3088 09-Nov-2016          0449724439 Bayldons@redkite.com.au            5
         7 Charli                         Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03-Dec-2015          0487186889 GemmaHansman@reefblue.com          4
         6 Gemma                          Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03-Mar-1980          0487186889 GemmaHansman@reefblue.com          4
         5 Sally                          Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 31-Jan-2013          0446129124 Johnsons@klog.com                  1
         4 Marie-Rose                     Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 28-Jun-2010          0446129124 Johnsons@klog.com                  1
         3 Darcy                                                         18 Farnell Street                                  Warrandyte
     VIC 3113 03-May-1951          0440814836 DSoares71@hour.com                 3
         2                                Roberts                        Unit 3, 13 Moruya Road                             Mooroolbark
     VIC 3138 04-Apr-1996          0461643245 BrookeRoberts@spi.com              2
         1 Jake                           Auld                           46 Glen William Road                               Blackburn
     VIC 3130 24-Apr-1967          0482848702 JakeAuld@hourapid.com              1

14 rows selected.

SQL> -- Checking "APPOINTMENT"
SQL> set echo off

   APPT_NO APPTDATETIME               APPT_ROOMNO A PATIENT_NO PROVID   NURSE_NO APPT_PRIOR_APPTNO
---------- -------------------------- ----------- - ---------- ------ ---------- -----------------
       105 04-sep-2023 16:00                    2 S        105 GEN001          6
       100 04-sep-2023 15:30                    2 S        100 GEN001          6
        14 14-aug-2023 14:00                    1 T          8 END001          3                 8
        16 14-aug-2023 10:30                    4 S         12 GEN003          7
        13 14-aug-2023 10:00                   11 L         11 PER001          4
        12 14-aug-2023 10:00                    5 S          1 ORS001          1                 9
        15 14-aug-2023 09:00                    6 S         10 PED001          8                11
        11 11-aug-2023 15:00                    7 L         10 PED002          8
         9 11-aug-2023 15:00                    5 S          1 ORS001          1                 1
        10 11-aug-2023 09:15                   12 T          9 PER002          4
         5 08-aug-2023 16:00                    2 T          5 GEN001          7
         4 08-aug-2023 15:00                    2 T          4 GEN001          7
         3 08-aug-2023 12:00                    5 L          3 ORS001          9
         7 08-aug-2023 12:00                    4 T          7 GEN003          5
         8 08-aug-2023 12:00                    1 L          8 END001          3
         6 08-aug-2023 11:00                    4 T          6 GEN003          5
         1 08-aug-2023 10:00                    5 L          1 ORS001          1
         2 08-aug-2023 10:00                    3 S          2 GEN002          2
```

```
18 rows selected.

SQL> ------------- Task 4 ALTER ------------------------------------------------
SQL> @T4-mns-alter.sql
SQL> --*****PLEASE ENTER YOUR DETAILS BELOW*****
SQL> --T4-mns-alter.sql
SQL> -- Sample Solution
SQL>
SQL> --4(a)
SQL> ALTER TABLE patient ADD patient_noofappointments NUMBER(3) DEFAULT 1 NOT NULL;

Table PATIENT altered.

SQL>
SQL> COMMENT ON COLUMN patient.patient_noofappointments IS
  2      'Total number of appointments';

Comment created.

SQL>
SQL> UPDATE patient
  2  SET
  3      patient_noofappointments = (
  4          SELECT
  5              COUNT(*)
  6          FROM
  7              appointment
  8          WHERE
  9              patient.patient_no = appointment.patient_no
 10      );

14 rows updated.

SQL>
SQL> COMMIT;

Commit complete.

SQL>
SQL> DESC patient;
Name                     Null?    Type
------------------------ -------- ------------
PATIENT_NO               NOT NULL NUMBER(4)
PATIENT_FNAME                     VARCHAR2(30)
PATIENT_LNAME                     VARCHAR2(30)
PATIENT_STREET           NOT NULL VARCHAR2(50)
PATIENT_CITY             NOT NULL VARCHAR2(20)
PATIENT_STATE            NOT NULL VARCHAR2(3)
PATIENT_POSTCODE         NOT NULL CHAR(4)
PATIENT_DOB              NOT NULL DATE
PATIENT_CONTACTMOBILE    NOT NULL CHAR(10)
PATIENT_CONTACTEMAIL     NOT NULL VARCHAR2(25)
EC_ID                    NOT NULL NUMBER(4)
PATIENT_NOOFAPPOINTMENTS NOT NULL NUMBER(3)
SQL>
SQL> SELECT
  2      *
  3  FROM
  4      patient;

PATIENT_NO PATIENT_FNAME                  PATIENT_LNAME                  PATIENT_STREET                                     PATIENT_CITY
     PAT PATI PATIENT_DOB PATIENT_CO PATIENT_CONTACTEMAIL           EC_ID PATIENT_NOOFAPPOINTMENTS
---------- ------------------------------ ------------------------------ -------------------------------------------------- ----------------
---- --- ---- ----------- ---------- ------------------------- ---------- ------------------------
         1 Jake                           Auld                           46 Glen William Road                               Blackburn
     VIC 3130 24/APR/1967 0482848702 JakeAuld@hourapid.com              1                        3
         2                                Roberts                        Unit 3, 13 Moruya Road                             Mooroolbark
     VIC 3138 04/APR/1996 0461643245 BrookeRoberts@spi.com              2                        1
         3 Darcy                                                         18 Farnell Street                                  Warrandyte
     VIC 3113 03/MAY/1951 0440814836 DSoares71@hour.com                 3                        1
         4 Marie-Rose                     Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 28/JUN/2010 0446129124 Johnsons@klog.com                  1                        1
         5 Sally                          Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 31/JAN/2013 0446129124 Johnsons@klog.com                  1                        1
         6 Gemma                          Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03/MAR/1980 0487186889 GemmaHansman@reefblue.com          4                        1
         7 Charli                         Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03/DEC/2015 0487186889 GemmaHansman@reefblue.com          4                        1
         8 Alice                          Bayldon                        33 Sunset Drive                                    Saint Helena
     VIC 3088 09/NOV/2016 0449724439 Bayldons@redkite.com.au            5                        2
         9 Ashley                         Soares                         14 Davis Street                                    Donvale
     VIC 3111 16/MAY/1975 0440814836 Ashley4173@kmpl.org                3                        1
        10 Imogen                                                        38 Mandible Street                                 Yellingbo
     VIC 3139 16/JUN/2014 0445070410 ImoHan@raindrop.com.au             6                        2
        11 Anthony                        Raggatt                        51 Ghost Hill Road                                 Kalkallo
     VIC 3064 05/APR/1997 0447793731 ARaggat@ylkie.com                  3                        1
        12 Lincoln                        Hansman                        38 Mandible Street                                 Yellingbo
     VIC 3139 10/SEP/1972 0462975870 Lincoln@raindrop.com.au            6                        1
       100 Laura                                                         66 Black Point Drive                               Clayton
     VIC 3168 13/APR/2011 0412523122 RobeyFam@gmail.com               100                        1
       105 Lachlan                                                       66 Black Point Drive                               Clayton
     VIC 3168 25/JUL/2014 0412523122 RobeyFam@gmail.com               100                        1

14 rows selected.

SQL>
SQL> --4(b)
SQL> DROP TABLE patient_emercontact cascade constraints purge;

Error starting at line : 32 File @ Ass2A/SampleSoln/Run/T4-mns-alter.sql
In command -
DROP TABLE patient_emercontact cascade constraints purge
Error report -
ORA-00942: table or view does not exist
00942. 00000 -  "table or view does not exist"
*Cause:
*Action:
SQL>
SQL> CREATE TABLE patient_emercontact
  2      AS
  3          SELECT
  4              patient_no,
  5              ec_id
  6          FROM
  7              patient;

Table PATIENT_EMERCONTACT created.

SQL>
SQL> COMMENT ON COLUMN patient_emercontact.patient_no IS
  2      'Patient identifier';

Comment created.

SQL>
SQL> COMMENT ON COLUMN patient_emercontact.ec_id IS
  2      'Emergency contact identifier';

Comment created.

SQL>
SQL> ALTER TABLE patient_emercontact ADD CONSTRAINT patient_emercontact_pk
  2  PRIMARY KEY ( patient_no, ec_id);

Table PATIENT_EMERCONTACT altered.

SQL>
SQL> ALTER TABLE patient_emercontact
  2      ADD CONSTRAINT patient_patientec_fk FOREIGN KEY ( patient_no )
  3          REFERENCES patient ( patient_no );

Table PATIENT_EMERCONTACT altered.

SQL>
SQL> ALTER TABLE patient_emercontact
  2      ADD CONSTRAINT emercontact_patientec_fk FOREIGN KEY ( ec_id )
  3          REFERENCES emergency_contact ( ec_id );

Table PATIENT_EMERCONTACT altered.

SQL>
SQL> ALTER TABLE patient DROP ( ec_id );

Table PATIENT altered.

SQL>
SQL> DESC patient;
Name                     Null?    Type
------------------------ -------- ------------
PATIENT_NO               NOT NULL NUMBER(4)
PATIENT_FNAME                     VARCHAR2(30)
PATIENT_LNAME                     VARCHAR2(30)
PATIENT_STREET           NOT NULL VARCHAR2(50)
PATIENT_CITY             NOT NULL VARCHAR2(20)
PATIENT_STATE            NOT NULL VARCHAR2(3)
PATIENT_POSTCODE         NOT NULL CHAR(4)
PATIENT_DOB              NOT NULL DATE
```

```
PATIENT_CONTACTMOBILE    NOT NULL CHAR(10)
PATIENT_CONTACTEMAIL     NOT NULL VARCHAR2(25)
PATIENT_NOOFAPPOINTMENTS NOT NULL NUMBER(3)
SQL>
SQL> SELECT
  2      *
  3  FROM
  4      patient;

PATIENT_NO PATIENT_FNAME                  PATIENT_LNAME                  PATIENT_STREET                                     PATIENT_CITY
     PAT PATI PATIENT_DOB PATIENT_CO PATIENT_CONTACTEMAIL      PATIENT_NOOFAPPOINTMENTS
---------- ------------------------------ ------------------------------ -------------------------------------------------- ----------------
---- --- ---- ----------- ---------- ------------------------- ------------------------
         1 Jake                           Auld                           46 Glen William Road                               Blackburn
     VIC 3130 24/APR/1967 0482848702 JakeAuld@hourapid.com                            3
         2                                Roberts                        Unit 3, 13 Moruya Road                             Mooroolbark
     VIC 3138 04/APR/1996 0461643245 BrookeRoberts@spi.com                            1
         3 Darcy                                                         18 Farnell Street                                  Warrandyte
     VIC 3113 03/MAY/1951 0440814836 DSoares71@hour.com                               1
         4 Marie-Rose                     Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 28/JUN/2010 0446129124 Johnsons@klog.com                                1
         5 Sally                          Johnson                        46 Glen William Road                               Blackburn
     VIC 3130 31/JAN/2013 0446129124 Johnsons@klog.com                                1
         6 Gemma                          Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03/MAR/1980 0487186889 GemmaHansman@reefblue.com                        1
         7 Charli                         Hansman                        37 Bayview Road                                    Tyringa
     SA  5671 03/DEC/2015 0487186889 GemmaHansman@reefblue.com                        1
         8 Alice                          Bayldon                        33 Sunset Drive                                    Saint Helena
     VIC 3088 09/NOV/2016 0449724439 Bayldons@redkite.com.au                          2
         9 Ashley                         Soares                         14 Davis Street                                    Donvale
     VIC 3111 16/MAY/1975 0440814836 Ashley4173@kmpl.org                              1
        10 Imogen                                                        38 Mandible Street                                 Yellingbo
     VIC 3139 16/JUN/2014 0445070410 ImoHan@raindrop.com.au                           2
        11 Anthony                        Raggatt                        51 Ghost Hill Road                                 Kalkallo
     VIC 3064 05/APR/1997 0447793731 ARaggat@ylkie.com                                1
        12 Lincoln                        Hansman                        38 Mandible Street                                 Yellingbo
     VIC 3139 10/SEP/1972 0462975870 Lincoln@raindrop.com.au                          1
       100 Laura                                                         66 Black Point Drive                               Clayton
     VIC 3168 13/APR/2011 0412523122 RobeyFam@gmail.com                               1
       105 Lachlan                                                       66 Black Point Drive                               Clayton
     VIC 3168 25/JUL/2014 0412523122 RobeyFam@gmail.com                               1

14 rows selected.

SQL>
SQL> DESC patient_emercontact;
Name       Null?    Type
---------- -------- ---------
PATIENT_NO NOT NULL NUMBER(4)
EC_ID      NOT NULL NUMBER(4)
SQL>
SQL> SELECT
  2      *
  3  FROM
  4      patient_emercontact;
```

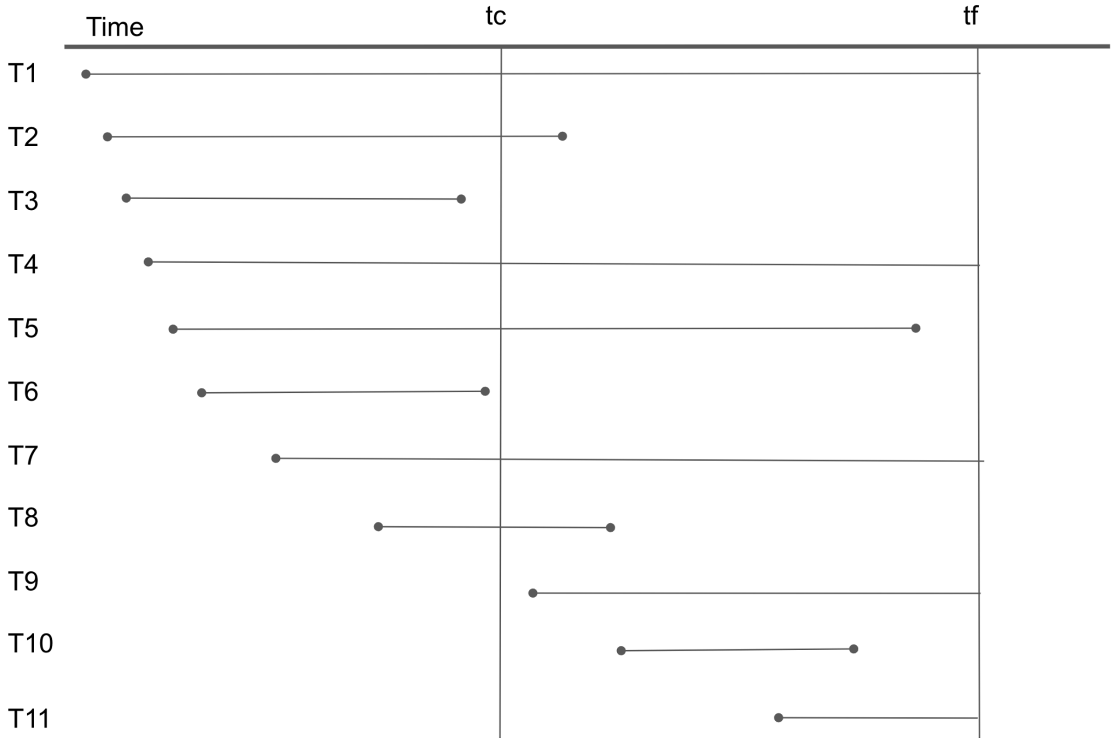
```
PATIENT_NO      EC_ID
---------- ----------
         1          1
         2          2
         3          3
         4          1
         5          1
         6          4
         7          4
         8          5
         9          3
        10          6
        11          3
        12          6
       100        100
       105        100

14 rows selected.

SQL>
SQL> --4(c)
SQL>
SQL> DROP TABLE nurse_training cascade constraints purge;

Error starting at line : 77 File @ Ass2A/SampleSoln/Run/T4-mns-alter.sql
In command -
DROP TABLE nurse_training cascade constraints purge
Error report -
ORA-00942: table or view does not exist
00942. 00000 -  "table or view does not exist"
*Cause:
*Action:
SQL>
SQL> CREATE TABLE nurse_training (
  2      nt_trainee_no  NUMBER(3) NOT NULL,
  3      nt_trainer_no  NUMBER(3) NOT NULL,
  4      nt_startdt     DATE NOT NULL,
  5      nt_enddt       DATE NOT NULL,
  6      nt_description VARCHAR2(100) NOT NULL
  7  );

Table NURSE_TRAINING created.

SQL>
SQL> COMMENT ON COLUMN nurse_training.nt_trainee_no IS
  2      'Trainee nurse number';

Comment created.

SQL>
SQL> COMMENT ON COLUMN nurse_training.nt_trainer_no IS
  2      'Trainer nurse number';

Comment created.

SQL>
SQL> COMMENT ON COLUMN nurse_training.nt_startdt IS
  2      'Training start date time';

Comment created.

SQL>
SQL> COMMENT ON COLUMN nurse_training.nt_enddt IS
  2      'Training end date time';

Comment created.

SQL>
SQL> COMMENT ON COLUMN nurse_training.nt_description IS
  2      'Training description';

Comment created.

SQL>
SQL> --alternative solution, add as surrogate key and unique constraint
SQL> ALTER TABLE nurse_training
  2      ADD CONSTRAINT nurse_training_pk PRIMARY KEY ( nt_trainee_no,
  3                                                     nt_startdt );

Table NURSE_TRAINING altered.

SQL> ALTER TABLE nurse_training
  2      ADD CONSTRAINT nurse_nursetrainee_fk FOREIGN KEY ( nt_trainee_no )
  3          REFERENCES nurse ( nurse_no );

Table NURSE_TRAINING altered.

SQL>
SQL> ALTER TABLE nurse_training
  2      ADD CONSTRAINT nurse_nursetrainer_fk FOREIGN KEY ( nt_trainer_no )
  3          REFERENCES nurse ( nurse_no );

Table NURSE_TRAINING altered.

SQL>
SQL> DESC nurse_training;
Name           Null?    Type
-------------- -------- -------------
NT_TRAINEE_NO  NOT NULL NUMBER(3)
NT_TRAINER_NO  NOT NULL NUMBER(3)
NT_STARTDT     NOT NULL DATE
NT_ENDDT       NOT NULL DATE
NT_DESCRIPTION NOT NULL VARCHAR2(100)
SQL>
SQL> set echo on
SQL> -- Checking Tables
SQL> set echo off

TABLE_NAME                     TABLE_TYPE
------------------------------ -----------
APPT_SEQ                       SEQUENCE
EC_SEQ                         SEQUENCE
```

```
PATIENT_SEQ                    SEQUENCE
APPOINTMENT                    TABLE
EMERGENCY_CONTACT              TABLE
NURSE                          TABLE
NURSE_TRAINING                 TABLE
PATIENT                        TABLE
PATIENT_EMERCONTACT            TABLE
PROVIDER                       TABLE
SPECIALISATION                 TABLE

11 rows selected.

SQL> --============================== END RUN ======================================---
SQL> set echo off
```

5(a)

A database has seven transactions running as listed below (the time is shown horizontally from left to right):

At time *tc* a checkpoint is taken, at time *tf* the database fails due to a power outage.



If the database is a **write through** database, two stages are involved in the recovery process when the database is restarted.

Use the diagram above to discuss what happens at each of the stages and which transactions are involved.

STAGE 1 - prepare undo list and redo lists - order does not matter here

UNDO

T1	T4	T7	T9	T11

REDO

T2	T5	T8	T10

STAGE 2 - undo uncommitted transactions starting from the newest

T11	T9	T7	T4	T1

STAGE 3 - redo committed transactions starting from the oldest

T2	T5	T8	T10

5(b)

Given the following transaction sequence, copy and paste this sequence into your answer document and clearly indicate what locks are present at each of the indicated times (Time 0 to Time 34).

Cell entries must have the form:

- **S(Tn) -** for a shared lock by Tn,
- **X(Tn)** - for an exclusive lock by Tn or
- **Tn wait Tm -** for a wait of Tn due to Tm (where n and m are transaction numbers).

TIME	TRANS	ACTION	A	B	C	D	E	F	G	H
0	T1	Read A	S(T1)							
1	T2	Read B		S(T2)						
2	T1	Read C			S(T1)					
3	T4	Read D				S(T4)				
4	T5	Read A	S(T5)							
5	T2	Read E					S(T2)			
6	T2	Update E					X(T2)			
7	T3	Read F						S(T3)		
8	T2	Read F						S(T2)		
9	T5	Update A	T5 wait T1							
10	**T1**	**Commit**	X(T5)							
11	T6	Read A	T6 wait T5							
12	**T5**	**Rollback**	S(T6)							
13	T6	Read C			S(T6)					
14	T6	Update C			X(T6)					
15	T7	Read G							S(T7)	
16	T8	Read H								S(T8)
17	T9	Read G							S(T9)	
18	T9	Update G							T9 wait T7	

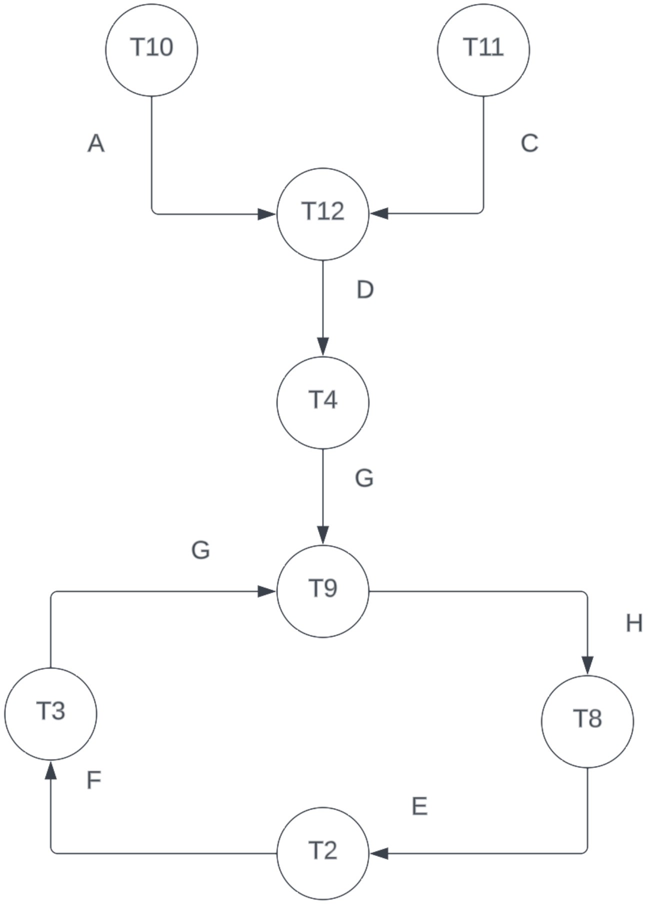
19	T8	Read E					**T8 wait T2**			
20	**T7**	**Commit**							X(T9)	
21	T9	Read H								S(T9)
22	T3	Read G							**T3 wait T9**	
23	T10	Read A	S(T10)							
24	T9	Update H								**T9 wait T8**
25	**T6**	**Commit**								
26	T11	Read C			S(T11)					
27	T12	Read D				S(T12)				
28	T12	Read C			S(T12)					
29	T2	Update F						**T2 wait T3**		
30	T11	Update C			**T11 wait T12**					
31	T12	Read A	S(T12)							
32	T10	Update A	**T10 wait T12**							
33	T12	Update D				**T12 wait T4**				
34	T4	Read G							**T4 wait T9**	

Complete the following:

(i) For **each** of the listed items A .. H, what wait states are present at time 34 (the last time listed). Shown the waits in the form:

Item A:	**T10 waiting on T12**
Item B:	**None**
Item C:	**T11 waiting on T12**
Item D:	**T12 wating on T4**
Item E:	**T8 waiting on T2**
Item F:	**T2 waiting on T3**
Item G:	**T3 waiting on T9**
	T4 waiting on T9
Item H:	**T9 waiting on T8**

(ii) Prepare a ***wait for graph*** indicating the state of waiting locks at time 34. Your *wait for graph* can be prepared using any drawing package such as LucidChart or free hand drawn. Paste/insert an image of your wait for graph into your answer document below your answer to (i) above



(iii) Report if deadlock exists or not, and if it does exist, list the transactions involved.

Deadlock involving T2, T3, T9 and T8. There is a loop between these transactions.