

Central Hospital Case Study

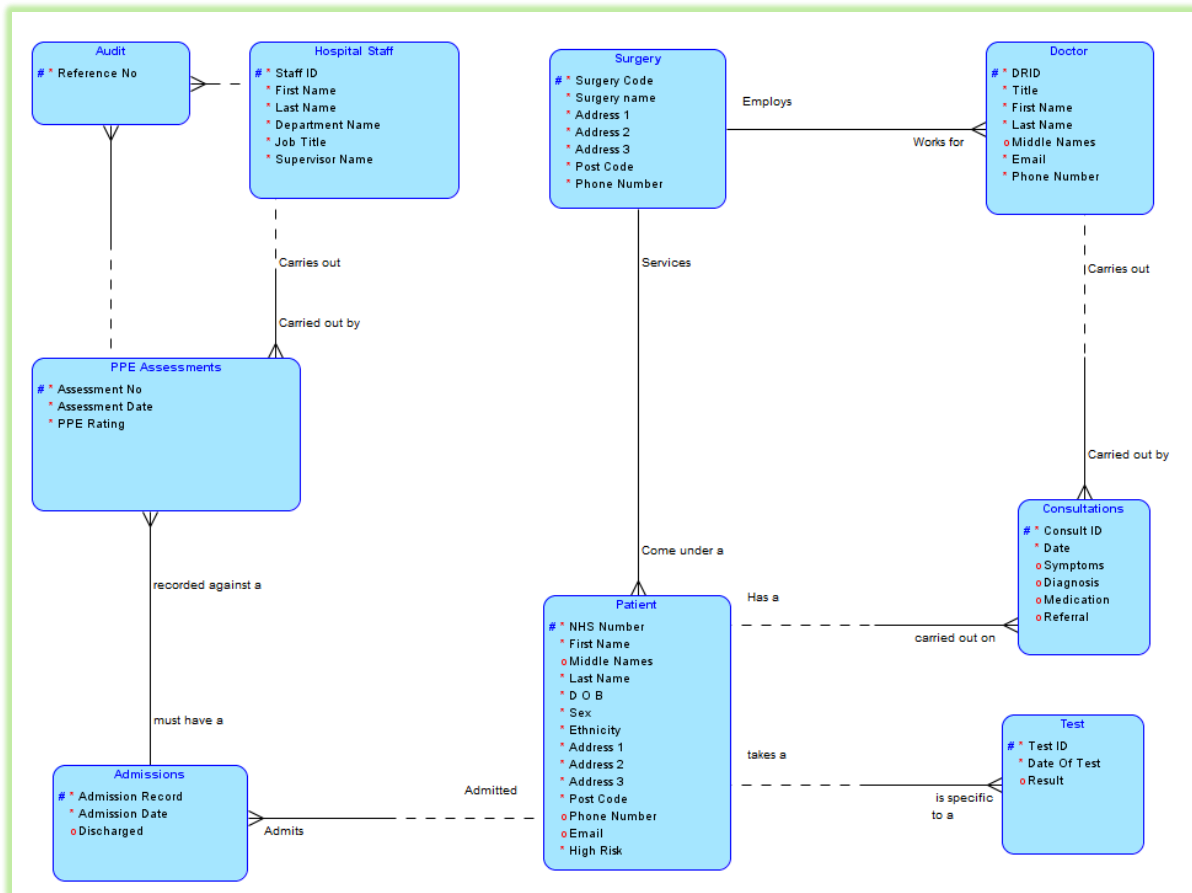
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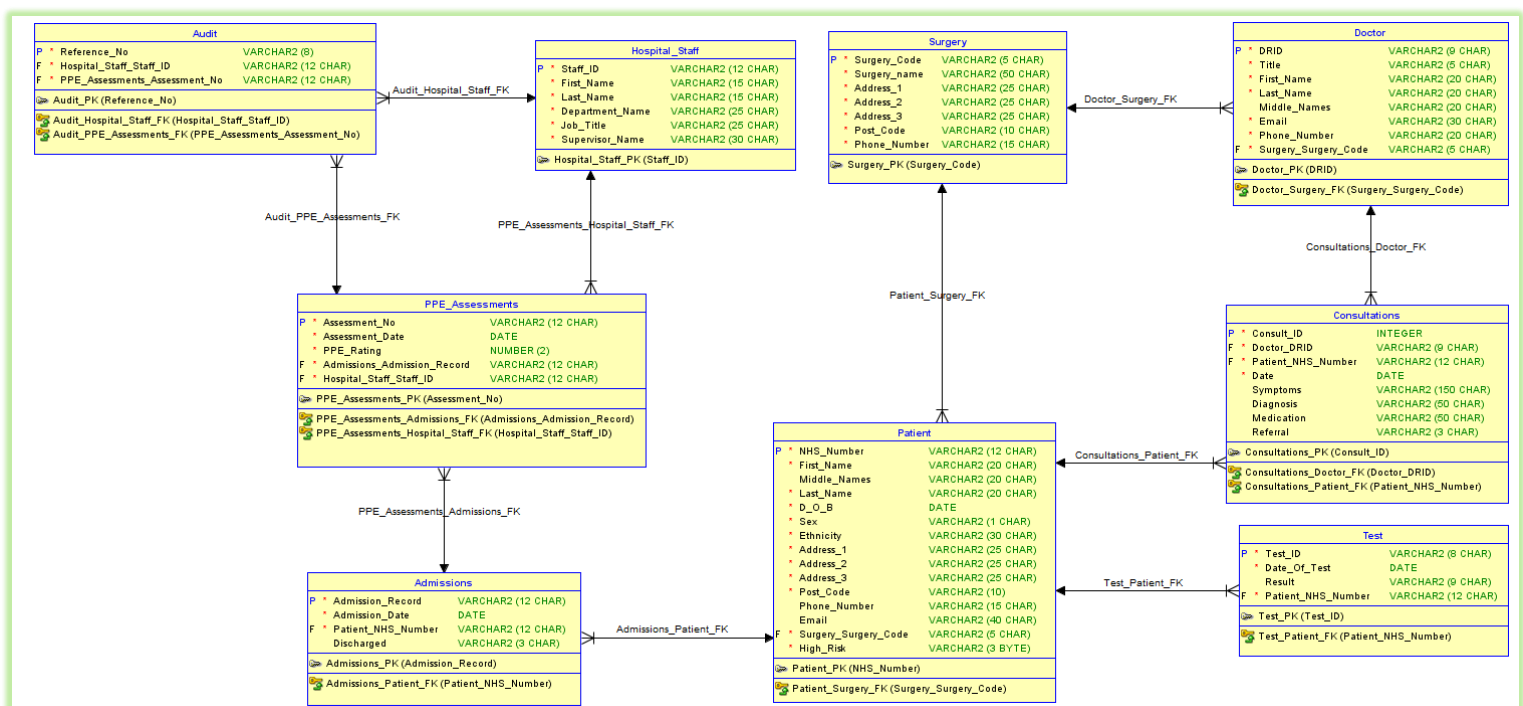
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Section one -Design

Logical ERD



Relational ERD



Assumptions

When designing the database tables and relationships the following assumptions were made:

- A patient belongs to a single surgery.
- A surgery can have many patients.
- A surgery can have many doctors.
- A doctor works for a single surgery.
- A patient can have multiple COVID tests.
- A patient can have multiple consultations.
- All patients have had a risk assessment, the result has been recorded in their entry in the patient table as low or high.
- Sample data, patients who are aged 60 or older are marked as high risk.
- Sample data, 50% of patients who are female aged between 25-35 are assumed to be pregnant and are marked as high risk.
- Sample data, 20% of remaining patients are marked as high risk.
- A doctor carries out a consultation on a patient.
- A referral takes place as a result of a consultation.
- A diagnosis is recorded during a consultation.
- Prescribed medication is recorded during a consultation.
- A positive test indicates that a patient will be in quarantine for 21 days from the test date.
- A referral indicates that the patient is now located at the Central Hospital.
- A patient has a PPE assessment at the point they reach the hospital.
- A PPE assessment is carried out by a member of hospital staff.
- A patient has another PPE assessment when the last assessment is more than 21 days old.
- A patient can have many PPE assessments by hospital staff.
- A patient who has tested positive will be marked as in quarantine in their record.

Set of tables

When creating the tables, the SQL Developer version 19.2.1.247 software was used. Please find below the SQL statements for each table within the database. The create table statements have been taken from the SQL tab within the program and as such include additional elements that would not typically be found in a standard create table statement. These further elements have been left in to show the most current level of functionality available within the Oracle Database software.

Surgery

```
CREATE TABLE "OPSS1725412"."SURGERY"
(
  "SURGERY_NAME" VARCHAR2(128 BYTE) NOT NULL ENABLE,
  "ADDRESS_1" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "ADDRESS_2" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "ADDRESS_3" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "POST_CODE" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "PHONE_NUMBER" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "EMAIL" VARCHAR2(128 BYTE) NOT NULL ENABLE,
  "SURGERY_CODE" NUMBER(38,0),
  CONSTRAINT "SURGERY_SURGERY_CODE_PK" PRIMARY KEY ("SURGERY_CODE")
)
USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;
```

Doctor

```
CREATE TABLE "OPSS1725412"."DOCTOR"
(
  "DRID" VARCHAR2(26 BYTE),
  "FIRST_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "MIDDLE_NAMES" VARCHAR2(26 BYTE),
  "LAST_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "EMAIL" VARCHAR2(128 BYTE) NOT NULL ENABLE,
  "PHONE_NUMBER" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "SURGERY_CODE" NUMBER(38,0) NOT NULL ENABLE,
  CONSTRAINT "DOCTOR_DRID_PK" PRIMARY KEY ("DRID")
)
USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ENABLE,
  CONSTRAINT "DOCTOR_SURGERY SURGERY_CODE FK" FOREIGN KEY ("SURGERY_CODE")
REFERENCES "OPSS1725412"."SURGERY" ("SURGERY_CODE") ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;
```

Patient

```

CREATE TABLE "OPSS1725412"."PATIENT"
(
  "FIRST_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "MIDDLE_NAMES" VARCHAR2(26 BYTE),
  "LAST_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "D_O_B" DATE NOT NULL ENABLE,
  "SEX" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "ETHNICITY" VARCHAR2(128 BYTE) NOT NULL ENABLE,
  "ADDRESS_1" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "ADDRESS_2" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "ADDRESS_3" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "POST_CODE" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "PHONE_NUMBER" VARCHAR2(26 BYTE),
  "EMAIL" VARCHAR2(128 BYTE),
  "NHS_NUMBER" VARCHAR2(26 BYTE),
  "SURGERY_CODE" NUMBER(38,0) NOT NULL ENABLE,
  "HIGH_RISK" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "QUARANTINE" VARCHAR2(4 BYTE),
  CONSTRAINT "PATIENT_NHS_NUMBER_PK" PRIMARY KEY ("NHS_NUMBER")
USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ENABLE,
  CONSTRAINT "PATIENT_SURGERY_CODE_FK" FOREIGN KEY ("SURGERY_CODE")
REFERENCES "OPSS1725412"."SURGERY" ("SURGERY_CODE") ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;

```

Consultations

```

CREATE TABLE "OPSS1725412"."CONSULTATIONS"
(
  "CONSULT_ID" NUMBER(38,0),
  "CONSULT_DATE" DATE NOT NULL ENABLE,
  "DOCTOR" VARCHAR2(128 BYTE) NOT NULL ENABLE,
  "NHS_NUMBER" VARCHAR2(128 BYTE) NOT NULL ENABLE,
  "SYMPTOMS" VARCHAR2(256 BYTE),
  "DIAGNOSIS" VARCHAR2(128 BYTE),
  "MEDICATION" VARCHAR2(256 BYTE),
  "REFERRAL" VARCHAR2(128 BYTE),
  CONSTRAINT "CONSULTATIONS_ID_PK" PRIMARY KEY ("CONSULT_ID")
USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ENABLE,
  CONSTRAINT "CONSULTATIONS_DOCTOR_DRID_FK" FOREIGN KEY ("DOCTOR")
REFERENCES "OPSS1725412"."DOCTOR" ("DRID") ENABLE,
  CONSTRAINT "CONSULTATIONS_PATIENT_NHS_NUMBER" FOREIGN KEY ("NHS_NUMBER")
REFERENCES "OPSS1725412"."PATIENT" ("NHS_NUMBER") ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;

```

Tests

```
CREATE TABLE "OPSS1725412"."TESTS"
(
  "TEST_ID" VARCHAR2(26 BYTE),
  "DATE_OF_TEST" DATE NOT NULL ENABLE,
  "RESULT" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "PATIENT_ID" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  CONSTRAINT "TESTS_TEST_ID_PK" PRIMARY KEY ("TEST_ID")
USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ENABLE,
  CONSTRAINT "TESTS_PATIENT_ID_NHS_NUMBER_FK" FOREIGN KEY ("PATIENT_ID")
REFERENCES "OPSS1725412"."PATIENT" ("NHS_NUMBER") ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;
```

Admissions

```
CREATE TABLE "OPSS1725412"."ADMISSIONS"
(
  "ADMISSION_ID" VARCHAR2(26 BYTE),
  "ADMISSION_DATE" DATE NOT NULL ENABLE,
  "NHS_NUMBER" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "DISCHARGED" VARCHAR2(26 BYTE),
  CONSTRAINT "ADMISSION_ID_PK" PRIMARY KEY ("ADMISSION_ID")
USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ENABLE,
  CONSTRAINT "ADMISSIONS_PATIENT_NHS_NUMBER_FK" FOREIGN KEY ("NHS_NUMBER")
REFERENCES "OPSS1725412"."PATIENT" ("NHS_NUMBER") ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;
```


Hospital Staff

```
CREATE TABLE "OPSS1725412"."HOSPITAL_STAFF"
(
  "STAFF_ID" VARCHAR2(26 BYTE),
  "FIRST_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "LAST_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "DEPARTMENT_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "JOB_TITLE" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "SUPERVISOR_NAME" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  CONSTRAINT "HOSPITAL_STAFF_STAFF_ID_PK" PRIMARY KEY ("STAFF_ID")
) USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 COMPUTE STATISTICS
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;
```

PPE Assessments

```
CREATE TABLE "OPSS1725412"."PPE_ASSESSMENTS"
(
  "ASSESSMENT_NO" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "ADMISSION_RECORD" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "STAFF_ID" VARCHAR2(26 BYTE) NOT NULL ENABLE,
  "ASSESSMENT_DATE" DATE NOT NULL ENABLE,
  "PPE_RATING" NUMBER(38,0) NOT NULL ENABLE,
  CONSTRAINT "PPE_ASSESSMENTS_ASSESSMENT_NO_PK" PRIMARY KEY ("ASSESSMENT_NO")
) DISABLE,
CONSTRAINT "PPE_ASSESSMENTS_HOSPITAL_STAFF_STAFF_ID_FK" FOREIGN KEY ("STAFF_ID")
REFERENCES "OPSS1725412"."HOSPITAL_STAFF" ("STAFF_ID") ENABLE
) SEGMENT CREATION IMMEDIATE
PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255
NOCOMPRESS LOGGING
STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645
PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1
BUFFER_POOL DEFAULT FLASH_CACHE DEFAULT CELL_FLASH_CACHE DEFAULT)
TABLESPACE "USERS" ;
```


Section two - Populating the database

In order to facilitate robust testing of the database, a large amount of sample data has been created. Whilst real names of surgeries have been used, all individuals are works of fiction and any similarity to any person living or deceased is purely coincidental.

Surgery

SELECT * FROM SURGERY

Query Result x

 SQL | All Rows Fetched: 7 in 0.021 seconds

	SURGERY_NAME	ADDRESS_1	ADDRESS_2	ADDRESS_3	POST_CODE	PHONE_NUMBER	EMAIL	SURGERY_CODE
1	All Saints And Rosevillas Medical Practice	17 Cartwright Street	Wolverhampton	West Midlands	WV2 1EU	01902 457617	m15637wolverhampton@nhs.net	15637
2	Ashfield Road Surgery	39 Ashfield Road	Wolverhampton	West Midlands	WV10 6QX	01902 783372	m92609wolverhampton@nhs.net	92609
3	Bilston Health Centre	Prouds Lane	Bilston	West Midlands	WV14 6PW	01902 405200	m65489wolverhampton@nhs.net	65489
4	Bilston Urban Village Medical Centre	Bankfield Road	Bilston	West Midlands	WV14 0EE	01902 409905	m78562wolverhampton@nhs.net	78562
5	Caerleon Surgery	Dover Street	Bilston	West Midlands	WV14 6AL	01902 493426	m23786wolverhampton@nhs.net	23786
6	East Park Medical Practice	Jonesfield Crescent	Wolverhampton	West Midlands	WV1 2LW	01902 455422	m94578wolverhampton@nhs.net	94578
7	Keats Grove Surgery	17 Keats Grove	Wolverhampton	West Midlands	WV10 8LY	01902 731907	m36785wolverhampton@nhs.net	36785

Doctor

SELECT * FROM DOCTOR

DRID	FIRST_NAME	MIDDLE_NAMES	LAST_NAME	EMAIL	PHONE_NUMBER	SURGERY_CODE
1 DRUK91718	Bert	John	Bradford	Bert.Bradford@nhs.net	01902 415313	15637
2 DRUK04503	Kadeem	(null)	Ali	Kadeem.Ali@nhs.net	01902 289793	15637
3 DRUK44076	Halle	(null)	Hanson	Halle.Hanson@nhs.net	01902 368598	15637
4 DRUK45082	Johnnie	(null)	Ewing	Johnnie.Ewing@nhs.net	01902 486528	15637
5 DRUK79355	Alissa	(null)	Sellers	Alissa.Sellers@nhs.net	01902 492253	23786
6 DRUK51226	Maisie	(null)	Fitzgerald	Maisie.Fitzgerald@nhs.net	01902 486798	23786
7 DRUK38324	Nyle	(null)	Penn	Nyle.Penn@nhs.net	01902 991903	23786
8 DRUK18850	Misha	(null)	Sanders	Misha.Sanders@nhs.net	01902 999327	23786
9 DRUK81360	Fionn	(null)	Riddle	Fionn.Riddle@nhs.net	01902 248377	36785
10 DRUK07742	Clay	(null)	Pitts	Clay.Pitts@nhs.net	01902 267487	36785
11 DRUK66827	Bea	(null)	Reed	Bea.Reed@nhs.net	01902 227622	36785
12 DRUK00829	Kurt	David	Rollins	Kurt.Rollins@nhs.net	01902 864380	36785
13 DRUK03529	Samiyah	(null)	Winters	Samiyah.Winters@nhs.net	01902 258658	65489
14 DRUK14451	Arwa	(null)	Wharton	Arwa.Wharton@nhs.net	01902 698254	65489
15 DRUK65996	Kate	Sarah	Hamer	Kate.Hamer@nhs.net	01902 569697	65489
16 DRUK20522	Jared	(null)	Lutz	Jared.Lutz@nhs.net	01902 514659	65489
17 DRUK56492	Tashan	Alice	Murphy	Tashan.Murphy@nhs.net	01902 367270	78562
18 DRUK20686	Kerri	(null)	Rooney	Kerri.Rooney@nhs.net	01902 367467	78562
19 DRUK85901	Keeva	(null)	Mosley	Keeva.Mosley@nhs.net	01902 885485	78562
20 DRUK19680	Maia	(null)	York	Maia.York@nhs.net	01902 555827	78562
21 DRUK00607	Leonard	(null)	Ware	Leonard.Ware@nhs.net	01902 486429	92609
22 DRUK61067	Krystian	(null)	Mahoney	Krystian.Mahoney@nhs.net	01902 247448	92609
23 DRUK50728	Sahra	(null)	Bradshaw	Sahra.Bradshaw@nhs.net	01902 418600	92609
24 DRUK96978	Sebastian	Steve	Zimmerman	Sebastian.Zimmerman@nhs.net	01902 357545	92609
25 DRUK80576	Leo	Jesus	Grainger	Leo.Grainger@nhs.net	01902 654167	94578
26 DRUK99087	Siena	(null)	Bishop	Siena.Bishop@nhs.net	01902 598600	94578
27 DRUK19930	Jon-Paul	(null)	Lowery	Jon-Paul.Lowery@nhs.net	01902 115473	94578
28 DRUK05658	Amin	(null)	Schneider	Amin.Schneider@nhs.net	01902 786430	94578

Patient

SELECT * FROM PATIENT

N.B. Over 150 patient records have been created, only showing a selection below.


Query Result x														
SQL Fetched 50 rows in 0.519 seconds														
FIRST_NAME	MIDDLE_NAMES	LAST_NAME	D_O_B	SEX	ETHNICITY	ADDRESS_1	ADDRESS_2	ADDRESS_3	POST_CODE	PHONE_NUMBER	EMAIL	NHS_NUMBER	SURGERY_CODE	HIGH_RISK
1	Maddy	(null)	Huber	02-MAY-61	F	White or White British	2 Ellenvale Close	Coseley	West Midlands WV14 5AZ	01902-382862	Maddy.Huber@hotmail.com	541 315 7263	23786	No
2	Ema	Eve	Melia	26-AUG-61	F	Black or Black British	Dower House	Burwarton	Wolverhampton WV16 6QH	01902-383967	Ema.Melia@gmail.co.uk	879 665 5747	23786	No
3	Abi	(null)	Archer	24-OCT-61	F	Mixed or Multiple	19 Windsor Road	Albrighton	West Midlands WV7 3PU	01902-394431	Abi.Archer@freereserve.net	794 275 9016	15637	No
4	Tasnim	(null)	Dowling	21-NOV-61	M	Black or Black British	126 Mount Road	Penn	West Midlands WV4 5RX	01902-396629	Tasnim.Dowling@aol.com	726 667 4274	36785	Yes
5	Ricky	(null)	Galloway	21-DEC-61	M	Black or Black British	9 Jeavons Place	Bilston	West Midlands WV14 0QP	01902-407695	Ricky.Galloway@gmail.co.uk	907 371 8458	15637	No
6	Tye	Kylan	Yu	30-AUG-62	M	White or White British	19 Underhill Lane	Wolverhampton	West Midlands WV10 8NT	01902-413151	Tye.Yu@gmail.com	226 319 7518	78562	No
7	Milli	Lea	Munro	24-JUN-63	F	White or White British	3 Harvington Lane	Coseley	West Midlands WV14 9QS	01902-413817	Milli.Munro@wlv.ac.uk	412 223 6887	23786	No
8	Jayden-James	(null)	Stevenson	30-JAN-65	M	Black or Black British	11 Inverkip Walk	Wolverhampton	West Midlands WV4 6BF	01902-417703	Jayden-James.Stevenson@freereserve.net	814 502 2169	78562	Yes
9	Vinny	(null)	Read	02-MAR-65	M	White or White British	2 Norfolk Road	Wolverhampton	West Midlands WV3 0JA	01902-418162	Vinny.Read@yahoo.co.uk	859 572 3593	78562	No
10	Yvonne	(null)	Ortega	04-JUN-65	F	White or White British	2 Bank Steps	Bridgnorth	West Midlands WV16 4BQ	01902-422156	Yvonne.Ortega@yahoo.co.uk	495 959 8901	15637	No
11	Georgiana	Natalee	Britt	15-JUL-65	F	Asian or Asian British: Indian	18 - 20 Broadway	Bushbury	West Midlands WV4 8EB	01902-425655	Georgiana.Britt@gmail.com	715 746 1162	23786	No
12	Neil	Immanuel	O'Connor	30-SEP-66	M	Asian or Asian British: Bangladeshi	Treetops Nursing home	Lodge Park	Claverley WV5 7DP	01902-426703	Neil.O'Connor@hotmail.co.uk	439 446 5646	36785	No
13	Aniela	(null)	Friedman	25-FEB-66	F	White or White British	3 Cross Road	Albrighton	West Midlands WV9 3RF	01902-439051	Aniela.Friedman@hotmail.com	277 771 7663	15637	No
14	Arbaaz	Christian	Contreras	03-MAY-66	M	Asian or Asian British: Bangladeshi	9 Coteswold Drive	Albrighton	West Midlands WV7 3DS	01902-452201	Arbaaz.Contreras@wlv.ac.uk	706 425 9790	15637	Yes
15	Nick	(null)	Jimenez	12-OCT-66	M	White or White British	5 Wendell Crest	Wolverhampton	West Midlands WV10 8UJ	01902-459266	Nick.Jimenez@freereserve.net	120 852 7191	92609	No
16	Alec	Cohen	Olsen	22-NOV-66	M	White or White British	13 North Crescent	Featherstone	West Midlands WV10 7AY	01902-463744	Alec.Olsen@gmail.com	105 203 2039	36785	No
17	Adrianna	(null)	Andrew	10-JAN-68	F	Mixed or Multiple	3 Greyfriars	Bridgnorth	West Midlands WV16 4JX	01902-465907	Adrianna.Andrew@gmail.com	765 795 2767	23786	No
18	Alix	(null)	Hebert	01-MAY-68	F	Asian or Asian British: Bangladeshi	5 River View	Bridgnorth	West Midlands WV15 5AT	01902-480050	Alix.Hebert@hotmail.com	730 529 9503	23786	No
19	Sheila	(null)	Delaney	16-AUG-69	F	White or White British	63 Leighton Road	Wolverhampton	West Midlands WV4 4AP	01902-482874	Sheila.Delaney@gmail.co.uk	190 781 7744	92609	No
20	Azaan	Leandro	Cleveland	17-JAN-70	M	Gypsy/Traveller/Irish Traveller	Pen Cristin Shaw Lane	Albrighton	West Midlands WV7 3DS	01902-484483	Azaan.Cleveland@gmail.com	917 528 5852	15637	Yes
21	Riyad	(null)	Allen	28-JAN-70	M	Gypsy/Traveller/Irish Traveller	59 Willcock Road	Wolverhampton	West Midlands WV2 2DA	01902-486739	Riyad.Allen@yahoo.co.uk	908 661 5547	92609	No
22	Alexandre	Emely	Craft	02-FEB-70	F	White or White British	25 Blackbrook Way	Wolverhampton	West Midlands WV10 8TB	01902-500831	Alexandre.Craft@wlv.ac.uk	943 621 6739	92609	No
23	Claran	(null)	Schultz	06-JUN-70	M	White or White British	1B Baylis Avenue	Ashmore Park	West Midlands WV11 2EP	01902-512436	Claran.Schultz@gmail.com	519 707 2054	15637	No
24	Leonie	Francesca	Osborne	03-JAN-71	F	Black or Black British	55 Birches Road	Codsall	West Midlands WV10 2JQ	01902-515821	Leonie.Osborne@ntl.co.uk	818 507 4832	23786	No
25	Amber-Rose	(null)	Hamilton	07-APR-71	F	Black or Black British	27 Osier Street	Wolverhampton	West Midlands WV1 2RW	01902-523818	Amber-Rose.Hamilton@gmail.com	871 466 1989	92609	Yes
26	Jevan	Turner	Keeling	01-JAN-72	M	Asian or Asian British: Bangladeshi	378 Bushbury Lane	Wolverhampton	West Midlands WV10 6JP	01902-525741	Jevan.Keeling@hotmail.com	633 796 9864	92609	Yes
27	Allan	Raphael	Clark	22-MAR-72	M	White or White British	3 Stanley Court	Perton	West Midlands WV6 7TG	01902-526207	Allan.Clark@gmail.co.uk	372 547 1207	65489	No
28	Chelsey	Joy	Blackmore	05-APR-72	F	Asian or Asian British: Other Asian	77 Goodyear Avenue	Wolverhampton	West Midlands WV10 9JS	01902-530912	Chelsey.Blackmore@blueyonder.co.uk	383 613 2003	94578	No
29	Yannis	Valentino	Garcia	04-SEP-72	M	White or White British	16 Dingle View	Bridgnorth	West Midlands WV16 4JL	01902-534678	Yannis.Garcia@hotmail.com	253 782 1692	15637	No
30	Aubrey	Trevor	Winters	31-OCT-72	M	Asian or Asian British: Bangladeshi	5 Birmingham Street	Willenhall	West Midlands WV13 2HW	01902-540784	Aubrey.Winters@hotmail.com	624 310 9331	78562	Yes
31	Alby	(null)	Conway	26-FEB-73	M	Mixed or Multiple	1 Flower Close	Featherstone	West Midlands WV10 7TF	01902-543026	Alby.Conway@freereserve.net	645 225 7043	36785	No

Consultations

SELECT * FROM CONSULTATIONS

N.B. Over 95 consultation records have been created, only showing a selection below.

Query Result x

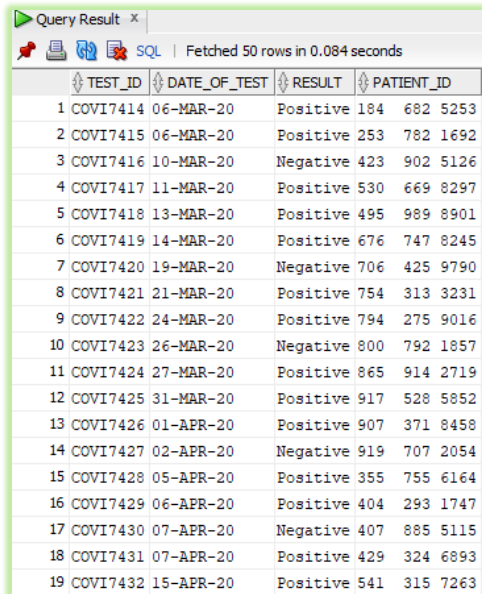
 | Fetched 50 rows in 0.023 seconds

	CONSULT_ID	CONSULT_DATE	DOCTOR	NHS_NUMBER	HIGH_RISK	SYMPTOMS	DIAGNOSIS	MEDICATION	REFERRAL
28	1082	02-OCT-20	DRUK96978	890 545 5710	Yes	Patient has a continuous cough and also lost sense of smell	Possible COVID	cough linctus, naproxen	Yes
29	1083	07-OCT-20	DRUK00607	908 661 5547	No	Patient has a continuous cough and high temperature 38.6	Probable COVID	high dose aspirin, etoricoxib, paracetamol	Yes
30	1085	19-OCT-20	DRUK50728	985 182 5758	No	Patient has a continuous cough and high temperature 38.6	Probable COVID	high dose aspirin, etoricoxib, paracetamol	Yes
31	1087	26-OCT-20	DRUK80576	102 367 3283	No	Patient has lost sense of taste	Possible COVID	diclofenac	Yes
32	1089	27-OCT-20	DRUK19930	141 416 9048	No	Patient has lost sense of taste	Possible COVID	diclofenac	Yes
33	1090	27-OCT-20	DRUK05658	171 894 8525	No	Patient has lost sense of taste	Possible COVID	diclofenac	Yes
34	1091	12-NOV-20	DRUK80576	204 565 6342	No	Patient has a continuous cough and also lost sense of smell	Possible COVID	cough linctus, naproxen	Yes
35	1092	12-NOV-20	DRUK99087	236 461 4937	No	Patient has a continuous cough and also lost sense of smell	Possible COVID	cough linctus, naproxen	Yes
36	1093	17-NOV-20	DRUK19930	255 436 5670	No	Patient has a continuous cough and high temperature 39.6	Probable COVID	high dose aspirin, etoricoxib, paracetamol	Yes
37	1095	25-NOV-20	DRUK80576	321 362 6369	Yes	Patient has a continuous cough and high temperature 38.6	Probable COVID	high dose aspirin, etoricoxib, paracetamol	Yes
38	1096	26-NOV-20	DRUK99087	343 332 7487	No	Patient has lost sense of smell	Possible COVID	Indomethacin	Yes
39	1097	27-NOV-20	DRUK19930	360 791 5166	Yes	Patient has lost sense of taste	Possible COVID	diclofenac	Yes
40	1098	30-NOV-20	DRUK05658	383 613 2003	Yes	Patient has a continuous cough and also lost sense of smell	Possible COVID	cough linctus, naproxen	Yes
41	1001	04-MAR-20	DRUK91718	184 682 5253	Yes	Patient has a continuous cough and high temperature 37	Common Cold	high dose aspirin, etoricoxib, paracetamol	No
42	1002	06-MAR-20	DRUK04503	253 782 1692	No	Patient has a continuous cough and high temperature 37	Common Cold	high dose aspirin, etoricoxib, paracetamol	No
43	1006	12-MAR-20	DRUK04503	607 375 6016	No	Patient appears fine, no symptoms	Hypochondriac	(null)	No
44	1007	12-MAR-20	DRUK44076	671 712 8376	No	Patient appears fine, no symptoms	Hypochondriac	(null)	No
45	1009	19-MAR-20	DRUK91718	706 425 9790	Yes	Patient has a high temperature 39	Infection	Penicillin	No
46	1017	02-APR-20	DRUK79355	303 537 6253	Yes	Patient appears fine, no symptoms	Hypochondriac	(null)	No

Tests

SELECT * FROM TESTS

N.B. Over 70 test records have been created, only showing a selection below.

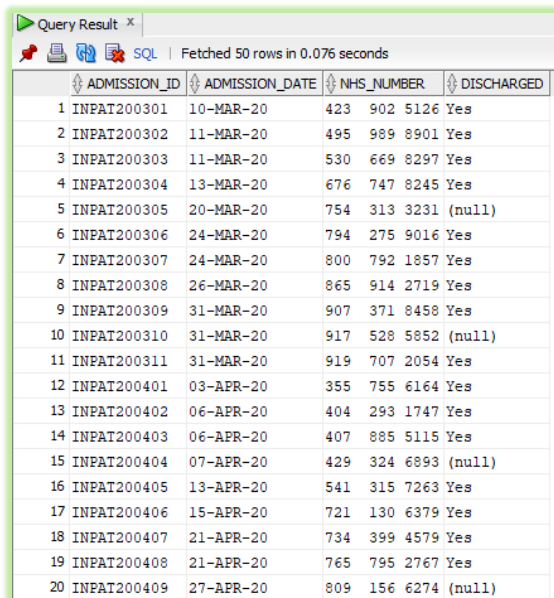


	TEST_ID	DATE_OF_TEST	RESULT	PATIENT_ID
1	COVI7414	06-MAR-20	Positive	184 682 5253
2	COVI7415	06-MAR-20	Positive	253 782 1692
3	COVI7416	10-MAR-20	Negative	423 902 5126
4	COVI7417	11-MAR-20	Positive	530 669 8297
5	COVI7418	13-MAR-20	Positive	495 989 8901
6	COVI7419	14-MAR-20	Positive	676 747 8245
7	COVI7420	19-MAR-20	Negative	706 425 9790
8	COVI7421	21-MAR-20	Positive	754 313 3231
9	COVI7422	24-MAR-20	Positive	794 275 9016
10	COVI7423	26-MAR-20	Negative	800 792 1857
11	COVI7424	27-MAR-20	Positive	865 914 2719
12	COVI7425	31-MAR-20	Positive	917 528 5852
13	COVI7426	01-APR-20	Positive	907 371 8458
14	COVI7427	02-APR-20	Negative	919 707 2054
15	COVI7428	05-APR-20	Positive	355 755 6164
16	COVI7429	06-APR-20	Positive	404 293 1747
17	COVI7430	07-APR-20	Negative	407 885 5115
18	COVI7431	07-APR-20	Positive	429 324 6893
19	COVI7432	15-APR-20	Positive	541 315 7263

Admissions

SELECT * FROM ADMISSIONS

N.B. Over 60 admission records have been created, only showing a selection below.

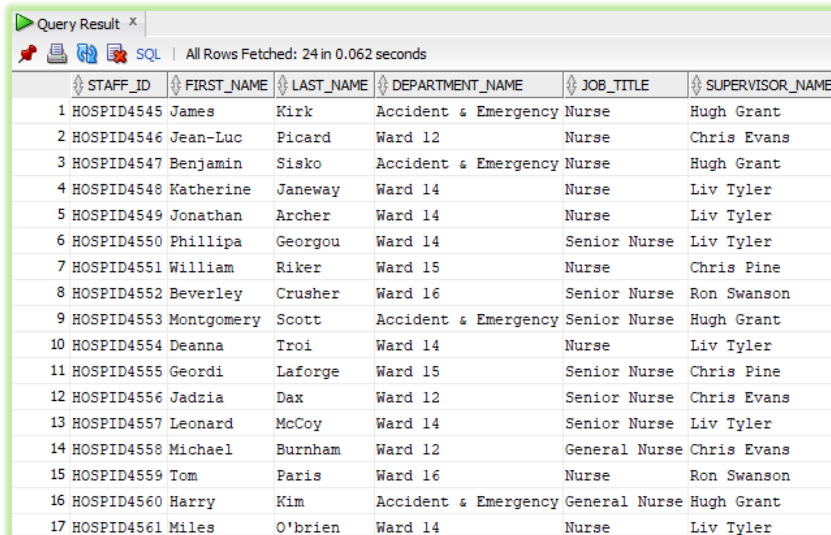


	ADMISSION_ID	ADMISSION_DATE	NHS_NUMBER	DISCHARGED
1	INPAT200301	10-MAR-20	423 902 5126	Yes
2	INPAT200302	11-MAR-20	495 989 8901	Yes
3	INPAT200303	11-MAR-20	530 669 8297	Yes
4	INPAT200304	13-MAR-20	676 747 8245	Yes
5	INPAT200305	20-MAR-20	754 313 3231	(null)
6	INPAT200306	24-MAR-20	794 275 9016	Yes
7	INPAT200307	24-MAR-20	800 792 1857	Yes
8	INPAT200308	26-MAR-20	865 914 2719	Yes
9	INPAT200309	31-MAR-20	907 371 8458	Yes
10	INPAT200310	31-MAR-20	917 528 5852	(null)
11	INPAT200311	31-MAR-20	919 707 2054	Yes
12	INPAT200401	03-APR-20	355 755 6164	Yes
13	INPAT200402	06-APR-20	404 293 1747	Yes
14	INPAT200403	06-APR-20	407 885 5115	Yes
15	INPAT200404	07-APR-20	429 324 6893	(null)
16	INPAT200405	13-APR-20	541 315 7263	Yes
17	INPAT200406	15-APR-20	721 130 6379	Yes
18	INPAT200407	21-APR-20	734 399 4579	Yes
19	INPAT200408	21-APR-20	765 795 2767	Yes
20	INPAT200409	27-APR-20	809 156 6274	(null)

Hospital Staff

SELECT * FROM HOSPITAL_STAFF

N.B. Over 20 hospital staff records have been created, only showing a selection below.

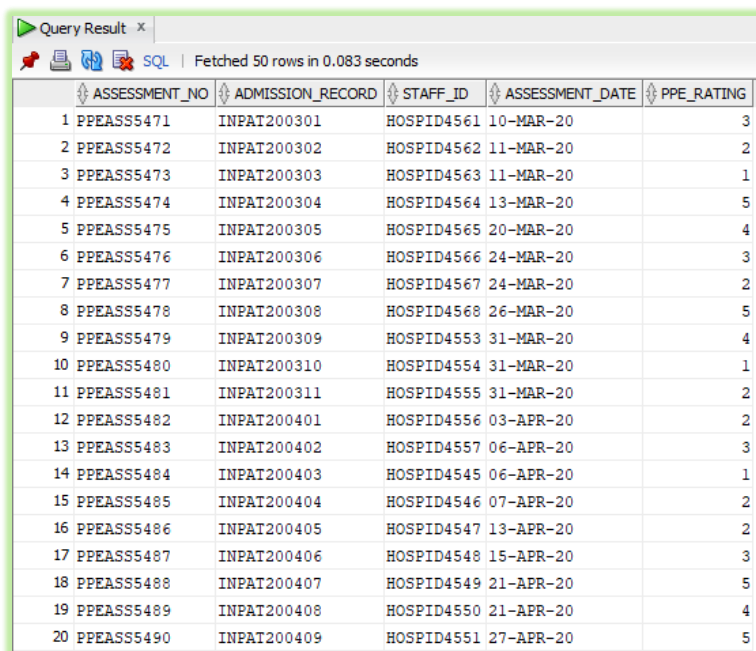


	STAFF_ID	FIRST_NAME	LAST_NAME	DEPARTMENT_NAME	JOB_TITLE	SUPERVISOR_NAME
1	HOSPID4545	James	Kirk	Accident & Emergency	Nurse	Hugh Grant
2	HOSPID4546	Jean-Luc	Picard	Ward 12	Nurse	Chris Evans
3	HOSPID4547	Benjamin	Sisko	Accident & Emergency	Nurse	Hugh Grant
4	HOSPID4548	Katherine	Janeway	Ward 14	Nurse	Liv Tyler
5	HOSPID4549	Jonathan	Archer	Ward 14	Nurse	Liv Tyler
6	HOSPID4550	Phillipa	Georgou	Ward 14	Senior Nurse	Liv Tyler
7	HOSPID4551	William	Riker	Ward 15	Nurse	Chris Pine
8	HOSPID4552	Beverley	Crusher	Ward 16	Senior Nurse	Ron Swanson
9	HOSPID4553	Montgomery	Scott	Accident & Emergency	Senior Nurse	Hugh Grant
10	HOSPID4554	Deanna	Troi	Ward 14	Nurse	Liv Tyler
11	HOSPID4555	Geordi	Laforge	Ward 15	Senior Nurse	Chris Pine
12	HOSPID4556	Jadzia	Dax	Ward 12	Senior Nurse	Chris Evans
13	HOSPID4557	Leonard	McCoy	Ward 14	Senior Nurse	Liv Tyler
14	HOSPID4558	Michael	Burnham	Ward 12	General Nurse	Chris Evans
15	HOSPID4559	Tom	Paris	Ward 16	Nurse	Ron Swanson
16	HOSPID4560	Harry	Kim	Accident & Emergency	General Nurse	Hugh Grant
17	HOSPID4561	Miles	O'brien	Ward 14	Nurse	Liv Tyler

PPE Assessments

SELECT * FROM PPE_ASSESSMENTS

N.B. Over 60 PPE assessment records have been created, only showing a selection below.



	ASSESSMENT_NO	ADMISSION_RECORD	STAFF_ID	ASSESSMENT_DATE	PPE_RATING
1	PPEASS5471	INPAT200301	HOSPID4561	10-MAR-20	3
2	PPEASS5472	INPAT200302	HOSPID4562	11-MAR-20	2
3	PPEASS5473	INPAT200303	HOSPID4563	11-MAR-20	1
4	PPEASS5474	INPAT200304	HOSPID4564	13-MAR-20	5
5	PPEASS5475	INPAT200305	HOSPID4565	20-MAR-20	4
6	PPEASS5476	INPAT200306	HOSPID4566	24-MAR-20	3
7	PPEASS5477	INPAT200307	HOSPID4567	24-MAR-20	2
8	PPEASS5478	INPAT200308	HOSPID4568	26-MAR-20	5
9	PPEASS5479	INPAT200309	HOSPID4553	31-MAR-20	4
10	PPEASS5480	INPAT200310	HOSPID4554	31-MAR-20	1
11	PPEASS5481	INPAT200311	HOSPID4555	31-MAR-20	2
12	PPEASS5482	INPAT200401	HOSPID4556	03-APR-20	2
13	PPEASS5483	INPAT200402	HOSPID4557	06-APR-20	3
14	PPEASS5484	INPAT200403	HOSPID4545	06-APR-20	1
15	PPEASS5485	INPAT200404	HOSPID4546	07-APR-20	2
16	PPEASS5486	INPAT200405	HOSPID4547	13-APR-20	2
17	PPEASS5487	INPAT200406	HOSPID4548	15-APR-20	3
18	PPEASS5488	INPAT200407	HOSPID4549	21-APR-20	5
19	PPEASS5489	INPAT200408	HOSPID4550	21-APR-20	4
20	PPEASS5490	INPAT200409	HOSPID4551	27-APR-20	5

Section three – Queries

Assignment specified queries

Query 1

Description

Find the surgery that referred the most number of patients, include their location;

Query

```
SELECT S.Post_Code, S.Surgery_Name, COUNT(*) as Referral_Count
FROM consultations C
join Doctor D
on C.doctor = D.drid
join Surgery S
on D.Surgery_Code = S.Surgery_Code
where c.referral = 'Yes'
group by s.surgery_name, s.Post_Code
ORDER BY Referral_Count DESC;
```

Results

	POST_CODE	SURGERY_NAME	REFERRAL_COUNT
1	WV10 8LY	Keats Grove Surgery	12
2	WV14 6AL	Caerleon Surgery	12
3	WV2 1EU	All Saints And Rosevillas Medical Practice	11
4	WV1 2LW	East Park Medical Practice	10
5	WV14 0EE	Bilston Urban Village Medical Centre	9
6	WV10 6QX	Ashfield Road Surgery	6
7	WV14 6PW	Bilston Health Centre	4

Query 2

Description

Write and test a query to list the patient name, gender, ethnicity and age of each patient who is in quarantine. Add a column that shows the average age of the patient;

n.b. This query was tested on 6-12-20 and the results are shown

Query

```
select P.First_name, P.Last_name, P.Sex, P.Ethnicity,
       Round((sysdate - P.D_O_B) / 365,0) as Age,
       round(avg(months_between(sysdate, p.d_o_b) / 12) over(), 0) as "Average Age"
From Patient P join
Tests T
on T.Patient_ID = P.NHS_Number
where T.Result = 'Positive' and
      T.date_of_test + 14 > SYSDATE
Group by P.first_name, P.Last_Name, P.Sex, P.Ethnicity, P.D_O_B
Order by Age desc;
```

Results

	FIRST_NAME	LAST_NAME	SEX	ETHNICITY	AGE	Average Age
1	Jayden-James	Stevenson	M	Black or Black British	56	42
2	Chelsey	Blackmore	F	Asian or Asian British: Other Asian	49	42
3	Caroline	Valencia	F	White or White British	41	42
4	Anna-Marie	Mcdermott	F	Asian or Asian British: Pakistani	39	42
5	Wayne	Kerr	M	Asian or Asian British: Other Asian	27	42

Query 3

Description

Find the location of the surgery that have an fewer high risk patients than the average number of high risk patients referred by all surgeries.

n.b. the average number of high risk patients that were referred across all surgeries was 5.

Query

```
Create view High_Risk_Referral_Count as
SELECT S.Post_Code, S.Surgery_Name, count(*) as rcount
from Surgery S join Patient P
on s.surgery_code = p.surgery_code
join Consultations C
on c.nhs_number = p.nhs_number
where c.referral = 'Yes'
and p.high_risk = 'Yes'
group by s.post_code, s.surgery_name;

Select * from High_Risk_Referral_Count
where rcount < (select Round(Avg(rcount),0) from High_Risk_Referral_Count);
```

Results

	POST_CODE	SURGERY_NAME	RCOUNT
1	WV10 8LY	Keats Grove Surgery	4
2	WV2 1EU	All Saints And Rosevillas Medical Practice	4
3	WV14 6AL	Caerleon Surgery	3
4	WV10 6QX	Ashfield Road Surgery	3

Student based queries

Query 4

Description

This query shows the email addresses for all patients who have tested positive for COVID, allowing them to be sent information about self-isolating procedures.

Query

```
Select P.email
from Patient P join tests T
on p.nhs_number = T.patient_id
where T.result = 'Positive';
```


Results

n.b. There were over 50 positive test results contained in the data set, the results shown are only a small portion.

EMAIL
1 Maddy.Huber@hotmail.com
2 Abi.Archer@freeserve.net
3 Ricky.Galloway@gmail.co.uk
4 Jayden-James.Stevenson@freeserve.net
5 Yvonne.Ortega@yahoo.co.uk
6 Neil.O'Connor@hotmail.co.uk
7 Nick.Jimenez@freeserve.net
8 Azaan.Cleveland@gmail.com
9 Riyadh.Allen@yahoo.co.uk
10 Chelsea.Blackmore@blueyonder.co.uk

Query 5

Description

This query shows the total number of patients of each ethnicity still in the hospital shown in descending order.

Query

```
Select p.ethnicity, count(*) as Total
from Patient P join Admissions A
on P.nhs_number = A.nhs_number
where A.Discharged is null
Group by p.ethnicity
order by Total desc;
```

Results

ETHNICITY	TOTAL
1 White or White British	18
2 Asian or Asian British: Chinese	3
3 Black or Black British	3
4 Asian or Asian British: Other Asian	2
5 Other Ethnic Group	2
6 Asian or Asian British: Indian	2
7 Gypsy/Traveller/Irish Traveller	2
8 Asian or Asian British: Pakistani	2

Query 6

Description

This query will show the names and phone number of all the patients who have been prescribed etoricoxib between June and September.

Query

```
Select P.first_name, P.last_Name, P.phone_number
from patient P join consultations C
on p.nhs_number = c.nhs_number
where c.medication LIKE '%etoricoxib%'
and c.consult_date between '01/JUN/2020' and '30/SEP/2020';
```


Results

	FIRST_NAME	LAST_NAME	PHONE_NUMBER
1	Jayden-James	Stevenson	01902-417703
2	Neil	O'Connor	01902-426703
3	Sheila	Delaney	01902-482874
4	Inaaya	Vo	01902-632841
5	Zephaniah	Kirby	01902-710179
6	Jaidon	Kirk	01902-795378
7	Mike	Hunt	07720 556021
8	Uzair	Barton	07965 128895
9	Wayne	Kerr	07756 108295
10	Kiki	Dean	07057 992934
11	Stephanie	Mcclure	07927 41400
12	Pia	Coleman	07966 712636
13	Asiya	Gutierrez	07725 696391
14	Vivek	O'Gallagher	01902-006834
15	Pawel	Rush	01902-246774
16	Conner	Avila	01902-307243

Section 4 – Materialised Views

Part A

Materialised View Description

The materialised view that has been created below is based upon the assumption that a lot of queries and statistical data will be gathered around it. Specifically, it contains all patient data for those patients that have tested positive for COVID.

Materialised View Creation statement

```

Create MATERIALIZED VIEW POSITIVE_PATIENTS
Build IMMEDIATE
Refresh complete on demand
as select * from patient P, tests T
where p.nhs_number = t.patient_id
and t.result = 'Positive';

```

Materialised View Results

Select * from Positive_Patients

	FIRST_NAME	MIDDLE_NAMES	LAST_NAME	D_O_B	SEX	ETHNICITY	ADDRESS_1	ADDRESS_2	ADDRESS_3	POST_CODE	PHONE_NUMBER	EMAIL	NHS_NUMBER	SURGERY_CODE
1	Maddy	(null)	Huber	02-MAY-61	F	White or White British	2 Ellenvale Close	Coseley	West Midlands WV14 9AZ	01902-382862	Maddy.Huber@hotmail.com		541 315 7263	237861
2	Abi	(null)	Archer	24-OCT-61	F	Mixed or Multiple	19 Windsor Road	Albrighton	West Midlands WV7 3PU	01902-394431	Abi.Archer@freemove.net		794 275 9016	156371
3	Ricky	(null)	Galloway	21-DEC-61	M	Black or Black British	9 Jeavons Place	Bilston	West Midlands WV14 0QP	01902-407695	Ricky.Galloway@gmail.co.uk		907 371 8458	156371
4	Jayden-James	(null)	Stevenson	30-JAN-65	M	Black or Black British	11 Inverkip Walk	Wolverhampton	West Midlands WV4 6BF	01902-417703	Jayden-James.Stevenson@freemove.net		814 502 2169	78562
5	Yvonne	(null)	Ortega	04-JUN-65	F	White or White British	2 Bank Steps	Bridgnorth	West Midlands WV16 4BQ	01902-422156	Yvonne.Ortega@yahoo.co.uk		495 989 8901	156371
6	Neil	Immanuel	O'Connor	30-SEP-65	M	Asian or Asian British: Bangladeshi	Treetops Nursing home	Lodge Park	Claverley WV6 7DP	01902-426703	Neil.O'Connor@hotmail.co.uk		439 446 5646	367851
7	Nick	(null)	Jimenez	12-OCT-66	M	White or White British	5 Wendell Crest	Wolverhampton	West Midlands WV10 8UJ	01902-459266	Nick.Jimenez@freemove.net		120 852 7191	926091
8	Azaan	Leandro	Cleveland	17-JAN-70	M	Gypsy/Traveller/Irish Traveller	Pen Cristin Shaw Lane	Albrighton	West Midlands WV7 3DS	01902-484483	Azaan.Cleveland@gmail.com		917 528 5852	156371
9	Riyad	(null)	Allen	28-JAN-70	M	Gypsy/Traveller/Irish Traveller	59 Willcock Road	Wolverhampton	West Midlands WV2 2DA	01902-486739	Riyad.Allen@yahoo.co.uk		908 661 5547	926091
10	Chelsey	Joy	Blackmore	05-APR-72	F	Asian or Asian British: Other Asian	77 Goodyear Avenue	Wolverhampton	West Midlands WV10 9JS	01902-530912	Chelsey.Blackmore@blueyonder.co.uk		383 613 2003	945781
11	Yannis	Valentino	Garcia	04-SEP-72	M	White or White British	16 Dingle View	Bridgnorth	West Midlands WV16 4JL	01902-534678	Yannis.Garcia@hotmail.com		253 782 1692	156371
12	Sara	Luna	Patel	01-JUL-73	F	White or White British	6 Westland Road	Wolverhampton	West Midlands WV3 5NY	01902-555115	Sara.Patel@gmail.com		262 056 3118	926091
13	Mila	Skylar	Rawlings	14-JUL-74	F	Black or Black British	458 - 462 Stafford	Wolverhampton	West Midlands WV2 6AW	01902-577434	Mila.Rawlings@hotmail.com		890 545 5710	926091
14	Nicholas	(null)	Alston	24-FEB-75	M	White or White British	16 Peacock Avenue	Wolverhampton	West Midlands WV11 2PR	01902-583227	Nicholas.Alston@gmail.co.uk		330 762 7229	78562
15	Dean	(null)	Tierney	12-AUG-76	M	Asian or Asian British: Indian	42 Hornby Road Goldthorn	Wolverhampton	West Midlands WV4 5EX	01902-594590	Dean.Tierney@yahoo.co.uk		389 550 8031	367851
16	Ubaid	Cole	Sheridan	11-FEB-77	M	White or White British	150 Broad Lane	Essington	West Midlands WV10 2RQ	01902-603175	Ubaid.Sheridan@wlv.ac.uk		992 573 5350	237861

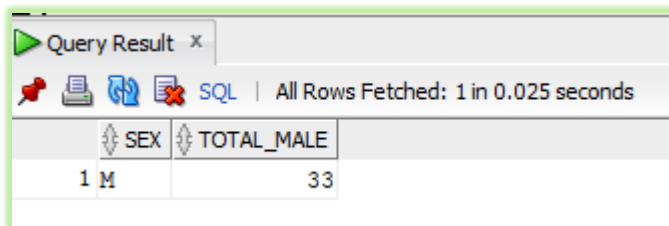
Part B

A comparison between running a query to see how many males have tested positive for covid is first run on the database, then subsequently run on the materialised view

Normal query

```
select P.sex, COUNT(*) as Total_Male
from Patient P
join Tests T
on P.nhs_Number = T.patient_ID
where T.Result = 'Positive'
and P.sex = 'M'
group by P.sex;
```

Normal query results

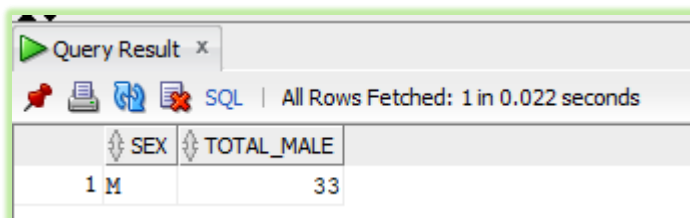


SEX	TOTAL_MALE
1 M	33

Materialised View query

```
select sex, COUNT(*) as Total_Male
from positive_patients
where sex = 'M'
group by sex;
```

Materialised View results



SEX	TOTAL_MALE
1 M	33

As you can see from the run time on each of the query results the query ran on the materialised view was completed in a faster time, approximately 12% faster. Whilst the sample data here is somewhat small in scope, should this same technique be used on a larger system, then these increases in efficiency will be more noticeable to the end user.

Section five – Triggers

Part A

For demonstrative purposes, half of the patients who have had a positive COVID test result have been marked as in quarantine, regardless of duration.

The below trigger has been created to enforce the rule that a quarantine state on a patient's record cannot be removed if a positive test result has been recorded within seven days of the requested record update.

Trigger A Code

```
CREATE OR REPLACE TRIGGER Quarantine_Check
after update of QUARANTINE
on Patient
for each row
when(old.quarantine = 'Yes')

DECLARE
todaysDate date := sysdate;
testDate date;

BEGIN
    Select T.Date_of_test into testDate FROM tests T WHERE T.Patient_ID = :NEW.NHS_Number
and T.result = 'Positive';
    if todaysDate-7 < testDate
    Then raise_application_error (-20100, 'Quarantine State Can not be changed as
less than 7 days');
    END if;
END;
/
```

Trigger A tests

The first test was made against a patient who had a positive result within the last seven days, the value of 'Yes' contained in the patient's record was attempted to be changed to null. Below is the expected error message.

```
One error saving changes to table "OPS$1725412"."PATIENT":
Row 25: ORA-20100: Quarantine State Can not be changed as less than 7 days
```

The second test was made against a patient who had been marked as in quarantine for longer than seven days and the value of 'Yes' contained in the patient's record was attempted to be changed to null. Below is the expected confirmation message that the table has been updated.

```
UPDATE "OPS$1725412"."PATIENT" SET QUARANTINE = '' WHERE ROWID = 'AAAstNAAHAAAapEAAP' AND ORA_ROWSCN = '44345016'
Commit Successful
```

Part B

When creating this trigger, a table called PPE_AUDIT was created and not populated with any records. Running a Select * from PPE_AUDIT generates the following result.

The screenshot shows a SQL query result window with the title 'Query Result'. The status bar indicates 'All Rows Fetched: 0 in 0.081 seconds'. The table structure is as follows:

STAFF_FI...	STAFF_LA...	DEPARTM...	JOB_TITLE	EVALUATI...	SUPERVIS...	EVALUATI...	ASSESSM...	AUDIT_ID
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The goal of this trigger is to populate the above fields with the associated information for the member of staff who completed the PPE assessment, when and only when a score of two or lower is recorded.

Trigger B Code

```
CREATE OR REPLACE TRIGGER PPE_Audit
after insert on PPE_ASSESSMENTS
for each row
DECLARE
targetScore int := 2;
assessmentNo VARCHAR2(30) := :new.Assessment_NO;
staffID VARCHAR2(30) := :new.Staff_ID;
ppeRating number := :new.PPE_Rating;
evaluationDate date := :new.Assessment_Date;
firstName VARCHAR2(30);
lastName VARCHAR2(30);
department VARCHAR2(30);
jobTitle VARCHAR2(30);
supervisor VARCHAR2(30);
BEGIN
    if ppeRating <= targetScore
    then
        Select H.First_Name into firstName FROM Hospital_Staff H WHERE H.Staff_ID = :NEW.Staff_ID;
        Select H.Last_Name into lastName FROM Hospital_Staff H WHERE H.Staff_ID = :NEW.Staff_ID;
        Select H.DEPARTMENT_NAME into department FROM Hospital_Staff H WHERE H.Staff_ID = :NEW.Staff_ID;
        Select H.JOB_TITLE into jobTitle FROM Hospital_Staff H WHERE H.Staff_ID = :NEW.Staff_ID;
        Select H.Supervisor_Name into supervisor FROM Hospital_Staff H WHERE H.Staff_ID = :NEW.Staff_ID;

        Insert into PPE_AUDIT
        (Staff_First_Name, Staff_Last_Name, Department, Job_title, Evaluation_Date, Supervisor,
        Evaluation, Assessment_no,Audit_ID)
        values
        (firstName,lastName,department,jobTitle,evaluationDate,supervisor,ppeRating,assessmentNo,'');
    END if;
END;
/
```

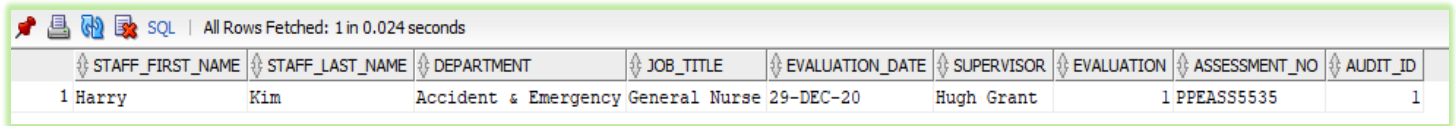
Trigger B Tests

The first test was made by adding a new record to the PPE_ASSESSMENTS table with a score of 1. The trigger successfully was run and the results of a select all query on the PPE_AUDIT table can be seen below.

The screenshot shows a SQL query result window with the title 'Query Result'. The status bar indicates 'All Rows Fetched: 1 in 0.024 seconds'. The table structure is as follows:

STAFF_FIRST_NAME	STAFF_LAST_NAME	DEPARTMENT	JOB_TITLE	EVALUATION_DATE	SUPERVISOR	EVALUATION	ASSESSMENT_NO	AUDIT_ID
1 Harry	Kim	Accident & Emergency	General Nurse	29-DEC-20	Hugh Grant	1	PPEASS5535	1

The second test was made by adding a new record to the PPE_ASSESSMENTS table with a score of 5. The trigger did not run, correctly so, and the results of a select all query on the PPE_AUDIT table can be seen below.



	STAFF_FIRST_NAME	STAFF_LAST_NAME	DEPARTMENT	JOB_TITLE	EVALUATION_DATE	SUPERVISOR	EVALUATION	ASSESSMENT_NO	AUDIT_ID
1	Harry	Kim	Accident & Emergency	General Nurse	29-DEC-20	Hugh Grant		1 PPEASS5535	1