Mimic3 - SQL

SP25 -Assignment

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General Notes:
Used both demo and clinical data base. Also limited the retrieved records as appropriate to save on compute time

Qn1 : How many patients are in the dataset?

SQL

```
SELECT count(*) FROM
`physionet-data.mimiciii_clinical.patients`
```

Result

46520

Remarks

Get an idea about the number of patients whose data is captured

Qn2 : Find out if more male/female patients are admitted

SQL

```
SELECT gender, COUNT(*)
FROM `physionet-data.mimiciii_clinical.patients`
GROUP BY gender;
              `
```

Result

```
gender f0_
F      20399
M      26121
```

Remarks

Get an idea about gender distribution. Higher hospital admissions for males, roughly 56% are male. Qn to ponder Why? There is no income data, will that matter?

Qn3 : Find out how many patients came for er but not too severely ill

Approach

Find out how unique patients in admissions not in icustats table

SQL

```
SELECT count(*)
FROM `physionet-data.mimiciii_demo.admissions` where subject_id not
in(select subject_id  from `physionet-data.mimiciii_demo.icustays`)
                        `
```

Result

0

Remarks

This means all patients who are admitted goes to icu. This is a learning.
I verified with
```
select count(distinct SUBJECT_ID) from
`physionet-data.mimiciii_demo.icustays` which is 100 and same result for

select count(distinct SUBJECT_ID) from
`physionet-data.mimiciii_demo.admissions`
```

Qn4 : Find out number of admissions in icu by the first icu unit

SQL

```
select first_careunit, count(*) from
`physionet-data.mimiciii_demo.icustays` group by FIRST_CAREUNIT,
order by count(*) desc
`
```

Result

first_careunit	f0_
MICU	77
SICU	23
CCU	19
TSICU	11
CSRU	6

Remarks

More admissions to MICU

Qn5 : Find out the 5 icu stays that were longest

SQL

```
SELECT icustay_id, round(los) AS los_integer_days
FROM `physionet-data.mimiciii_demo.icustays` order by
los_integer_days desc limit 5;

`
```

Result

```
icustay_id   los_integer_days
249805 35.0
239396 31.0
250305 29.0
223177 25.0
271544 22.0
```

Remarks

35 days of ICU stay is unimaginable

Qn6 : Explore admissions - where do the patient come from

SQL

```
select admission_location, count(*) from
`physionet-data.mimiciii_demo.admissions` group by
admission_location
`
```

Result

```
admission_location  f0_
EMERGENCY ROOM ADMIT      81
CLINIC REFERRAL/PREMATURE 12
PHYS REFERRAL/NORMAL DELI  10
TRANSFER FROM HOSP/EXTRAM 25
TRANSFER FROM SKILLED NUR  1
```

Remarks

Mostly are from emergency room. Need to understand the sequence, from emergency to hospitals to icus

Qn7 : Explore admissions - list records who did not make it in an admission

SQL

```sql
select * from `physionet-data.mimiciii_demo.admissions` where
DEATHTIME is not null limit 10
```

Result

ROW_ID	SUBJECT_ID	HADM_ID	ADMITTIME	DISCHTIME	DEATHTIME	ADMISSION_TYPE	ADMISSION_LOCATION	DISCHARGE_LOCATION	INSURANCE
LANGUAGE	RELIGION	MARITAL_STATUS		ETHNICITY	EDREGTIME	EDOUTTIME	DIAGNOSIS	HOSPITAL_EXPIRE_FLAG	HAS_CHARTEVENTS_DATA	
12286	10036	189483	2185-03-24T16:56:00	2185-03-26T09:15:00	2185-03-26T09:15:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare		JEWISH	MARRIED	WHITE	2185-03-24T12:38:00	2185-03-24T19:14:00	SEPSIS	1	1	
12295	10045	126949	2129-11-24T00:31:00	2129-12-01T01:45:00	2129-12-01T01:45:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare		PROTESTANT QUAKER	MARRIED	WHITE	2129-11-23T18:26:00	2129-11-24T01:35:00	FEVER	1	1	
12309	10059	122098	2150-08-22T17:33:00	2150-08-29T18:20:00	2150-08-29T18:20:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare		CATHOLIC	MARRIED	WHITE	2150-08-22T14:55:00	2150-08-22T18:00:00	LOWER GI BLEED	1	1	
12314	10064	111761	2127-03-19T14:39:00	2127-03-19T18:09:00	2127-03-19T18:09:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare		UNOBTAINABLE		WHITE	2127-03-19T12:54:00	2127-03-19T15:39:00	SUBDURAL HEMATOMA/S/P FALL		1	
1										
12317	10067	160442	2130-10-06T01:34:00	2130-10-06T02:29:00	2130-10-06T02:29:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Private		UNOBTAINABLE		OTHER	2130-10-06T00:12:00	2130-10-06T01:30:00	S/P MOTORCYCLE ACCIDENT	1	1	
12319	10069	146672	2188-02-08T11:15:00	2188-02-27T18:41:00	2188-02-27T18:41:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicaid				UNKNOWN/NOT SPECIFIED	2188-02-07T15:50:00	2188-02-08T12:00:00	SEIZURE	1	1	
12326	10076	198503	2107-03-21T21:16:00	2107-03-30T12:00:00	2107-03-30T12:00:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare	MAND	NOT SPECIFIED	MARRIED	ASIAN	2107-03-21T17:24:00	2107-03-22T01:12:00	LUNG CANCER;SHORTNESS OF BREATH		
1	1									
12340	10089	190301	2132-08-05T18:48:00	2132-08-08T02:15:00	2132-08-08T02:15:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare		UNOBTAINABLE		WHITE	2132-08-05T14:38:00	2132-08-05T22:07:00	BASAL GANGLIN BLEED	1	1	
12344	10093	165393	2141-01-25T08:35:00	2141-01-26T03:05:00	2141-01-26T03:05:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare		UNOBTAINABLEWIDOWED	WHITE	2141-01-25T07:10:00	2141-01-25T10:06:00	CRITICAL AORTIC STENOSIS/HYPOTENSION	1		
1										
12346	10094	122928	2180-03-15T22:35:00	2180-03-20T18:00:00	2180-03-20T18:00:00	EMERGENCY	EMERGENCY ROOM ADMIT		DEAD/EXPIRED
Medicare		UNOBTAINABLE		BLACK/AFRICAN AMERICAN	2180-03-15T17:14:00	2180-03-16T00:58:00	SEPSIS;TELEMETRY		1	
1										

Remarks

List of records from admission table where deathtime is maintained

Qn8 : Explore admissions - Identify unique patients who did not make it

SQL

```
select distinct(subject_id) from
`physionet-data.mimiciii_demo.admissions` where DEATHTIME is not
null limit 10
```

Result

subject_id
10036
10045
10059
10064
10067
10069
10076
10089
10093
10094

Remarks

A patient may be admitted many times, this is to find if there is any data error

Qn9 : Explore prescriptions and icu stays - How many patients have insulin adminsitered

SQL

```sql
SELECT  count(distinct(a.SUBJECT_ID)) FROM
`physionet-data.mimiciii_demo.icustays` a inner join
`physionet-data.mimiciii_demo.prescriptions` b on a.ICUSTAY_ID =
b.ICUSTAY_ID where drug = 'Insulin'
```

Result

53

Remarks

Get an idea for diabetic patients admitted

Qn10 : Explore cohort selection - Inspiration from the tutorial from MIMIC site

```
Choose cohorts for a diabetic study.
Criteria : Patients who are administered insulin and exclusion criteria is if their age is < 65
```

SQL

```sql
with co as
(
SELECT  a.SUBJECT_ID,a.drug, date_diff(a.STARTDATE,b.DOB,year) as age FROM
`physionet-data.mimiciii_demo.prescriptions` a
inner join `physionet-data.mimiciii_demo.patients` b on a.subject_id = b.subject_id
where a.drug = 'Insulin'
)
SELECT
 co.subject_id, co.drug,co.age
 , CASE
        WHEN co.age < 65 then 1
   ELSE 0
   END
     as exclusion_diabetes
FROM co limit 10
```

Results

subject_id	drug	age	exclusion_diabetes
41795	Insulin	49	1
42367	Insulin	87	0
42367	Insulin	87	0
42367	Insulin	87	0
42367	Insulin	87	0
42367	Insulin	87	0
42367	Insulin	87	0
42367	Insulin	87	0
42367	Insulin	87	0
43798	Insulin	62	1

Age is approximated by subtracting date of birth from insulin start date
 First inner join with patients
and then get the exclusion flag marked