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SKILL-3

```
In [1]: ▶ import pandas as pd  
import numpy as np
```

```
In [2]: #1
#Loading data & cleaning
df = pd.read_csv('Hospital General Information.csv',encoding="ISO-8859-1")
df
```

Out[2]:

	Provider ID	Hospital Name	Address	City	State	ZIP Code	County Name	Phone Number	Hospital Type	Ownership
0	10001	SOUTHEAST ALABAMA MEDICAL CENTER	1108 ROSS CLARK CIRCLE	DOTHAN	AL	36301	HOUSTON	3347938701	Acute Care Hospitals	Government
1	10005	MARSHALL MEDICAL CENTER SOUTH	2505 U S HIGHWAY 431 NORTH	BOAZ	AL	35957	MARSHALL	2565938310	Acute Care Hospitals	Government
2	10006	ELIZA COFFEE MEMORIAL HOSPITAL	205 MARENGO STREET	FLORENCE	AL	35631	LAUDERDALE	2567688400	Acute Care Hospitals	Government
3	10007	MIZELL MEMORIAL HOSPITAL	702 N MAIN ST	OPP	AL	36467	COVINGTON	3344933541	Acute Care Hospitals	Non-Profit
4	10008	CRENSHAW COMMUNITY HOSPITAL	101 HOSPITAL CIRCLE	LUVERNE	AL	36049	CRENSHAW	3343353374	Acute Care Hospitals	Private
...
4807	670118	FIRST TEXAS HOSPITAL	9922 LOUETTA RD	HOUSTON	TX	77070	HARRIS	8442641435	Acute Care Hospitals	Private
4808	640001	LBJ TROPICAL MEDICAL CENTER	FAGAALU VILLAGE	PAGO PAGO	AS	96799	NaN	6846334590	Acute Care Hospitals	Government
4809	650001	GUAM MEMORIAL HOSPITAL AUTHORITY	850 GOV CARLOS G CAMACHO ROAD	TAMUNING	GU	96913	NaN	6716472552	Acute Care Hospitals	Government
4810	650003	GUAM REGIONAL MEDICAL CITY	133 ROUTE 3	DEDEDO	GU	96929	NaN	6716455500	Acute Care Hospitals	Non-Profit
4811	660001	COMMONWEALTH HEALTH CENTER	PO BOX 409CK, NAVY HILL ROAD	GARAPAN	MP	96950	NaN	6702348950	Acute Care Hospitals	Private

4812 rows × 28 columns

```
In [3]: ▶ #1
#Loading data & cleaning
df.isnull().sum()
```

```
Out[3]: Provider ID          0
Hospital Name              0
Address                   0
City                      0
State                     0
ZIP Code                  0
County Name              15
Phone Number             0
Hospital Type            0
Hospital Ownership       0
Emergency Services       0
Meets criteria for meaningful use of EHRs 143
Hospital overall rating   0
Hospital overall rating footnote 3414
Mortality national comparison 0
Mortality national comparison footnote 3460
Safety of care national comparison 0
Safety of care national comparison footnote 2644
Readmission national comparison 0
Readmission national comparison footnote 3795
Patient experience national comparison 0
Patient experience national comparison footnote 3443
Effectiveness of care national comparison 0
Effectiveness of care national comparison footnote 3610
Timeliness of care national comparison 0
Timeliness of care national comparison footnote 3546
Efficient use of medical imaging national comparison 0
Efficient use of medical imaging national comparison footnote 2779
dtype: int64
```

```
In [4]: #1
#Loading data & cleaning
df.notnull()
```

Out[4]:

	Provider ID	Hospital Name	Address	City	State	ZIP Code	County Name	Phone Number	Hospital Type	Hospital Ownership	...	Readmission national comparison	Re
0	True	True	True	True	True	True	True	True	True	True	...	True	
1	True	True	True	True	True	True	True	True	True	True	...	True	
2	True	True	True	True	True	True	True	True	True	True	...	True	
3	True	True	True	True	True	True	True	True	True	True	...	True	
4	True	True	True	True	True	True	True	True	True	True	...	True	
...	
4807	True	True	True	True	True	True	True	True	True	True	...	True	
4808	True	True	True	True	True	True	False	True	True	True	...	True	
4809	True	True	True	True	True	True	False	True	True	True	...	True	
4810	True	True	True	True	True	True	False	True	True	True	...	True	
4811	True	True	True	True	True	True	False	True	True	True	...	True	

4812 rows × 28 columns

```
In [5]: #2
#Hospital Analysis- 'Hospital Type' by 'Ownership'
hospital_analysis=df.groupby(['Hospital Ownership','Hospital Type']).size()
hospital_analysis
```

```
Out[5]: Hospital Ownership      Hospital Type
Government - Federal          Acute Care Hospitals      37
                                Critical Access Hospitals    8
Government - Hospital District or Authority  Acute Care Hospitals      273
                                                Childrens              1
                                                Critical Access Hospitals    287
Government - Local            Acute Care Hospitals      176
                                Critical Access Hospitals    231
Government - State            Acute Care Hospitals       50
                                Childrens                  3
                                Critical Access Hospitals    12
Physician                     Acute Care Hospitals       65
                                Critical Access Hospitals     3
Proprietary                   Acute Care Hospitals      725
                                Childrens                  8
                                Critical Access Hospitals    67
Tribal                         Acute Care Hospitals        5
                                Critical Access Hospitals     4
Voluntary non-profit - Church  Acute Care Hospitals      278
                                Childrens                  1
                                Critical Access Hospitals    64
Voluntary non-profit - Other  Acute Care Hospitals      359
                                Childrens                  16
                                Critical Access Hospitals    87
Voluntary non-profit - Private Acute Care Hospitals     1401
                                Childrens                  70
                                Critical Access Hospitals    581

dtype: int64
```

```
In [6]: #3
#Total number of Hospitals in each 'State'
no_of_hospitals=df.groupby(['State']).size()
no_of_hospitals
```

```
Out[6]: State
AK      22
AL      90
AR      75
AS       1
AZ      80
CA     343
CO      78
CT      31
DC       8
DE       7
FL     187
GA     133
GU       2
HI      23
IA     116
ID      41
IL     180
IN     120
KS     137
KY      94
LA     121
MA      64
MD      49
ME      33
MI     131
MN     131
MO     112
MP       1
MS      95
MT      62
NC     107
ND      44
NE      89
NH      26
NJ      66
NM      41
NV      35
NY     171
OH     168
OK     124
OR      60
PA     171
PR      52
RI      11
SC      60
SD      60
TN     107
TX     411
UT      46
VA      86
VI       2
VT      14
WA      91
WI     126
WV      49
WY      28
dtype: int64
```

```
In [7]: #4
#Country wise hospital numbers in 'TX'
country_wise=df[df['State']=='TX']
country_wise
```

Out[7]:

	Provider ID	Hospital Name	Address	City	State	ZIP Code	County Name	Phone Number	Hospital Type	Ho: Owne
3954	450002	PROVIDENCE MEMORIAL HOSPITAL	2001 N OREGON ST	EL PASO	TX	79902	EL PASO	9155776011	Acute Care Hospitals	Propr
3955	450007	PETERSON REGIONAL MEDICAL CENTER	551 HILL COUNTRY DRIVE	KERRVILLE	TX	78028	KERR	8308964200	Acute Care Hospitals	Vol non-ç P
3956	450010	UNITED REGIONAL HEALTH CARE SYSTEM	1600 11TH STREET	WICHITA FALLS	TX	76301	WICHITA	9407643055	Acute Care Hospitals	Vol non-ç P
3957	450011	ST JOSEPH REGIONAL HEALTH CENTER	2801 FRANCISCAN DR	BRYAN	TX	77802	BRAZOS	9797763912	Acute Care Hospitals	Vol non-ç P
3958	450015	PARKLAND HEALTH AND HOSPITAL SYSTEM	5200 HARRY HINES BLVD	DALLAS	TX	75235	DALLAS	2145908000	Acute Care Hospitals	Goverr - Ho Dist Aut
...
4803	670114	WEIMAR MEDICAL CENTER	400 YOUENS DR	WEIMAR	TX	78962	COLORADO	9797258274	Acute Care Hospitals	Propr
4804	670115	CLEVELAND EMERGENCY HOSPITAL	1017 S TRAVIS AVE	CLEVELAND	TX	77327	LIBERTY	2816595400	Acute Care Hospitals	Propr
4805	670116	WISE HEALTH SYSTEM	3200 NORTH TARRANT PARKWAY	FORT WORTH	TX	76177	TARRANT	8175027300	Acute Care Hospitals	Goverr - Ho Dist Aut
4806	670117	TEXAS GENERAL HOSPITAL-VZPMC LP	707 N WALDRIP ST	GRAND SALINE	TX	75140	VAN ZANDT	9039625200	Acute Care Hospitals	Propr
4807	670118	FIRST TEXAS HOSPITAL	9922 LOUETTA RD	HOUSTON	TX	77070	HARRIS	8442641435	Acute Care Hospitals	Propr

411 rows × 28 columns

```
In [8]: #5
#Distribution of 'Hospital Type' and 'Ownership in Texas'
ownership_texas=df[['State','Hospital Ownership']]
ownership_texas=ownership_texas[ownership_texas['State']=='TX']
ownership_texas
```

Out[8]:

	State	Hospital Ownership
3954	TX	Proprietary
3955	TX	Voluntary non-profit - Private
3956	TX	Voluntary non-profit - Private
3957	TX	Voluntary non-profit - Private
3958	TX	Government - Hospital District or Authority
...
4803	TX	Proprietary
4804	TX	Proprietary
4805	TX	Government - Hospital District or Authority
4806	TX	Proprietary
4807	TX	Proprietary

411 rows × 2 columns

```
In [9]: #6
#Find 'Timeliness of care national comparison footnote' and its 'hospital'
timeliness=pd.crosstab(df['Hospital Name'],df['Timeliness of care national comparison footnote'])
timeliness
```

Out[9]:

Timeliness of care national comparison footnote	False
Hospital Name	
ABBEVILLE AREA MEDICAL CENTER	1
ABBEVILLE GENERAL HOSPITAL	1
ABBOTT NORTHWESTERN HOSPITAL	1
ABILENE REGIONAL MEDICAL CENTER	1
ABINGTON MEMORIAL HOSPITAL	1
...	...
YORK HOSPITAL	2
YUKON KUSKOKWIM DELTA REG HOSPITAL	1
YUMA DISTRICT HOSPITAL	1
YUMA REGIONAL MEDICAL CENTER	1
ZUNI COMPREHENSIVE COMMUNITY HEALTH CENTER	1

4623 rows × 1 columns


```
In [10]: #7
#Hospital rating
hospital_rating=df[['Hospital Type','Hospital overall rating']]
hospital_rating
```

Out[10]:

	Hospital Type	Hospital overall rating
0	Acute Care Hospitals	3
1	Acute Care Hospitals	3
2	Acute Care Hospitals	2
3	Acute Care Hospitals	2
4	Acute Care Hospitals	3
...
4807	Acute Care Hospitals	Not Available
4808	Acute Care Hospitals	Not Available
4809	Acute Care Hospitals	3
4810	Acute Care Hospitals	Not Available
4811	Acute Care Hospitals	Not Available

4812 rows × 2 columns

```
In [11]: #8
#Find 'Acute Care Hospitals' with rating (4) along with 'state'
df.loc[(df['Hospital overall rating']=="4") & (df['Hospital Type']=="Acute Care Hospitals"),['
```

Out[11]:

	State
10	AL
11	AL
14	AL
15	AL
17	AL
...	...
4777	TX
4779	TX
4780	TX
4782	TX
4784	TX

724 rows × 1 columns

```
In [12]: ▶ #9
#Which type of hospitals has highest 'Non-availability' of 'Safety of Care data'
res=df.loc[(df["Safety of care national comparison"]=="Not Available"),["Hospital Type"]]
res.mode()
```

Out[12]:

	Hospital Type
0	Critical Access Hospitals

```
In [13]: ▶ #10
#What are the different types of 'Patient experience national comparison' and list their 'Prov
df.groupby(["Patient experience national comparison", "Provider ID"]).size()
```

Out[13]:

Patient experience national comparison	Provider ID	
Above the national average	10021	1
	10022	1
	10029	1
	10033	1
	10044	1
Same as the national average	670023	1
	670044	1
	670047	1
	670085	1
	670106	1

Length: 4812, dtype: int64