In [1]:
```
# Exercise Part 3
```

In [13]:
```
import pandas as pd
meteorites = pd.read_csv('data/Meteorite_Landings.csv')
```

In [14]:
```
meteorites['id'].dtype
```

Out[14]:
```
dtype('int64')
```

In [15]:
```
meteorites
```

Out[15]:

	name	id	nametype	recclass	mass (g)	fall	year	reclat
0	Aachen	1	Valid	L5	21.0	Fell	01/01/1880 12:00:00 AM	50.77500
1	Aarhus	2	Valid	H6	720.0	Fell	01/01/1951 12:00:00 AM	56.18333
2	Abee	6	Valid	EH4	107000.0	Fell	01/01/1952 12:00:00 AM	54.21667
3	Acapulco	10	Valid	Acapulcoite	1914.0	Fell	01/01/1976 12:00:00 AM	16.88333
4	Achiras	370	Valid	L6	780.0	Fell	01/01/1902 12:00:00 AM	-33.16667
...	...	...	...	...	...	...	...	...
45711	Zillah 002	31356	Valid	Eucrite	172.0	Found	01/01/1990 12:00:00 AM	29.03700
45712	Zinder	30409	Valid	Pallasite, ungrouped	46.0	Found	01/01/1999 12:00:00 AM	13.78333
45713	Zlin	30410	Valid	H4	3.3	Found	01/01/1939 12:00:00 AM	49.25000
45714	Zubkovsky	31357	Valid	L6	2167.0	Found	01/01/2003 12:00:00 AM	49.78917
45715	Zulu Queen	30414	Valid	L3.7	200.0	Found	01/01/1976 12:00:00 AM	33.98333

45716 rows × 10 columns

In [16]:
```
meteorites['year'] = meteorites.year.str.slice(6,11) # Update year column to only c
meteorites['year']
```

Out[16]:
```
0        1880
1        1951
2        1952
3        1976
4        1902
         ...
45711    1990
45712    1999
45713    1939
45714    2003
45715    1976
Name: year, Length: 45716, dtype: object
```

In [19]:
```
meteorites['year'] = meteorites.year.apply(pd.to_numeric) # convert into numeric
meteorites['year'].dtype
```

Out[19]:
```
dtype('float64')
```

In [20]:
```
meteorites = meteorites.assign(
    Fell_before_1970 = lambda x: x.year < 1970
)
meteorites
```

Out[20]:

	name	id	nametype	recclass	mass (g)	fall	year	reclat	re
0	Aachen	1	Valid	L5	21.0	Fell	1880.0	50.77500	6.
1	Aarhus	2	Valid	H6	720.0	Fell	1951.0	56.18333	10.
2	Abee	6	Valid	EH4	107000.0	Fell	1952.0	54.21667	-113.
3	Acapulco	10	Valid	Acapulcoite	1914.0	Fell	1976.0	16.88333	-99.
4	Achiras	370	Valid	L6	780.0	Fell	1902.0	-33.16667	-64.
...	...	...	...	...	...	...	...	...	
45711	Zillah 002	31356	Valid	Eucrite	172.0	Found	1990.0	29.03700	17.
45712	Zinder	30409	Valid	Pallasite, ungrouped	46.0	Found	1999.0	13.78333	8.
45713	Zlin	30410	Valid	H4	3.3	Found	1939.0	49.25000	17.
45714	Zubkovsky	31357	Valid	L6	2167.0	Found	2003.0	49.78917	41.
45715	Zulu Queen	30414	Valid	L3.7	200.0	Found	1976.0	33.98333	-115.

45716 rows × 11 columns

In [21]:
```
meteorites = meteorites.set_index('id')
```

In [22]:
```
meteorites = meteorites # index is set to 'id'
```

In [23]:
```
meteorites = meteorites.sort_index(axis = 0)
meteorites
```

Out[23]:

id	name	nametype	recclass	mass (g)	fall	year	reclat	reclong	GeoL
1	Aachen	Valid	L5	21.0	Fell	1880.0	50.77500	6.08333	
2	Aarhus	Valid	H6	720.0	Fell	1951.0	56.18333	10.23333	(5 1
4	Abajo	Valid	H5	331.0	Found	1982.0	26.80000	-105.41667	-10
5	Abbott	Valid	H3-6	21100.0	Found	1951.0	36.30000	-104.28333	-10
6	Abee	Valid	EH4	107000.0	Fell	1952.0	54.21667	-113.00000	(5
...	...	...	...	...	...	...	...	...	
57454	Mandalay Spring	Valid	L6	2854.0	Found	2012.0	40.89201	-118.55319	(4 -11
57455	Antelope	Valid	H4	754.0	Found	2012.0	40.90183	-118.54465	(4 -11
57456	Northwest Africa 7870	Valid	L4	42.0	Found	2004.0	0.00000	0.00000	
57457	Northwest Africa 7871	Valid	L6	450.0	Found	2004.0	0.00000	0.00000	
57458	Northwest Africa 7873	Valid	H5-6	446.0	Found	2009.0	0.00000	0.00000	

45716 rows × 10 columns

In [24]:
```
meteorites.loc[10036 : 10040] # Extract all rows with ID between 10036 to 10040
```

Out[24]:

id	name	nametype	recclass	mass (g)	fall	year	reclat	reclong	Ge
10036	Enigma	Valid	H4	94.0	Found	1967.0	31.33333	-82.31667	
10037	Enon	Valid	Iron, ungrouped	763.0	Found	1883.0	39.86667	-83.95000	
10038	Enshi	Valid	H5	8000.0	Fell	1974.0	30.30000	109.50000	(3
10039	Ensisheim	Valid	LL6	127000.0	Fell	1491.0	47.86667	7.35000	