

```
import numpy as np
import pandas as pd
```

```
data = pd.read_csv('/content/matches.csv')
```

```
data
#entire table is a dataframe
#single row or single column is series
```

```
data.head()
```

```
data.tail()
```

	id	season	city	date	team1	team2	toss_winner	toss_decision
631	632	2016	Raipur	2016-05-22	Delhi Daredevils	Royal Challengers Bangalore	Royal Challengers Bangalore	field
632	633	2016	Bangalore	2016-05-24	Gujarat Lions	Royal Challengers Bangalore	Royal Challengers Bangalore	field
633	634	2016	Delhi	2016-05-25	Sunrisers Hyderabad	Kolkata Knight Riders	Kolkata Knight Riders	field
634	635	2016	Delhi	2016-05-27	Gujarat Lions	Sunrisers Hyderabad	Sunrisers Hyderabad	field
635	636	2016	Bangalore	2016-05-29	Sunrisers Hyderabad	Royal Challengers Bangalore	Sunrisers Hyderabad	bat

```
data.shape
```

```
#returns the tuple (number of rows, number of columns)
```

```
(636, 18)
```

```
data.info()
```

```
#coumns information
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 636 entries, 0 to 635
Data columns (total 18 columns):
#   Column                Non-Null Count  Dtype
---  -
0   id                     636 non-null    int64
1   season                 636 non-null    int64
2   city                   629 non-null    object
3   date                   636 non-null    object
4   team1                  636 non-null    object
5   team2                  636 non-null    object
6   toss_winner            636 non-null    object
7   toss_decision          636 non-null    object
8   result                 636 non-null    object
9   dl_applied             636 non-null    int64
10  winner                  633 non-null    object
11  win_by_runs             636 non-null    int64
12  win_by_wickets          636 non-null    int64
13  player_of_match        633 non-null    object
14  venue                   636 non-null    object
15  umpire1                 635 non-null    object
16  umpire2                 635 non-null    object
17  umpire3                 0 non-null      float64
dtypes: float64(1), int64(5), object(12)
memory usage: 89.6+ KB
```

```
data.describe()
```

```
data.describe()
```

```
#only describe numerical values
```

	id	season	dl_applied	win_by_runs	win_by_wickets	umpire3
count	636.000000	636.000000	636.000000	636.000000	636.000000	0.0
mean	318.500000	2012.490566	0.025157	13.682390	3.372642	NaN
std	183.741666	2.773026	0.156726	23.908877	3.420338	NaN
min	1.000000	2008.000000	0.000000	0.000000	0.000000	NaN
25%	159.750000	2010.000000	0.000000	0.000000	0.000000	NaN
50%	318.500000	2012.000000	0.000000	0.000000	4.000000	NaN
75%	477.250000	2015.000000	0.000000	20.000000	7.000000	NaN
max	636.000000	2017.000000	1.000000	146.000000	10.000000	NaN

```
data['winner']
```

```
#How to access a particular column from csv
```

```
0      Sunrisers Hyderabad
1      Rising Pune Supergiant
2      Kolkata Knight Riders
3      Kings XI Punjab
4      Royal Challengers Bangalore
...
631    Royal Challengers Bangalore
632    Royal Challengers Bangalore
633    Sunrisers Hyderabad
634    Sunrisers Hyderabad
635    Sunrisers Hyderabad
Name: winner, Length: 636, dtype: object
```

```
data[['winner','team1']]
```

```
#accessing 2 files
```

	winner	team1
0	Sunrisers Hyderabad	Sunrisers Hyderabad
1	Rising Pune Supergiant	Mumbai Indians
2	Kolkata Knight Riders	Gujarat Lions
3	Kings XI Punjab	Rising Pune Supergiant
4	Royal Challengers Bangalore	Royal Challengers Bangalore
...
631	Royal Challengers Bangalore	Delhi Daredevils
632	Royal Challengers Bangalore	Gujarat Lions
633	Sunrisers Hyderabad	Sunrisers Hyderabad
634	Sunrisers Hyderabad	Gujarat Lions
635	Sunrisers Hyderabad	Sunrisers Hyderabad

636 rows × 2 columns

```
type(data['winner'])
```

```
pandas.core.series.Series
```

```
data.iloc[1:3]
```

```
#iloc is used to fetch particular rows feom dataframe
```

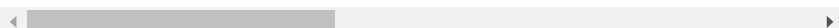
```
#works as a range function
```

	id	season	city	date	team1	team2	toss_winner	toss_decision	result
1	2	2017	Pune	2017-04-06	Mumbai Indians	Rising Pune Supergiant	Rising Pune Supergiant		field normal

```
data.iloc[[1,11,2]]
```

```
#used for rows works as range function
```

	id	season	city	date	team1	team2	toss_winner	toss_decision	
1	2	2017	Pune	2017-04-06	Mumbai Indians	Rising Pune Supergiant	Rising Pune Supergiant		field
11	12	2017	Bangalore	2017-04-14	Royal Challengers Bangalore	Mumbai Indians	Mumbai Indians		field
2	3	2017	Rajkot	2017-04-07	Gujarat Lions	Kolkata Knight Riders	Kolkata Knight Riders		field



```
data.iloc[:,[4,5]]
```

```
# iloc used for coloumn
```

	team1	team2
0	Sunrisers Hyderabad	Royal Challengers Bangalore
1	Mumbai Indians	Rising Pune Supergiant
2	Gujarat Lions	Kolkata Knight Riders
3	Rising Pune Supergiant	Kings XI Punjab
4	Royal Challengers Bangalore	Delhi Daredevils
...
631	Delhi Daredevils	Royal Challengers Bangalore
632	Gujarat Lions	Royal Challengers Bangalore
633	Sunrisers Hyderabad	Kolkata Knight Riders
634	Gujarat Lions	Sunrisers Hyderabad
635	Sunrisers Hyderabad	Royal Challengers Bangalore

636 rows × 2 columns

```
# filtering on the dataframe
```

```
def get_count_of_matches(city):
```

```
    mask = data['city'] == city
```

```
    return data[mask].shape[0]
```

```
get_count_of_matches('Bangalore')
```

66

```
mask1 = data['city']=='Hyderabad'
```

```
mask2 = data['date']>'2010-01-01'
```

```
data[mask1 & mask2].shape
```

(42, 18)

```
# value_counts
```

```
data['winner'].value_counts()
```

```

Mumbai Indians          92
Chennai Super Kings     79
Kolkata Knight Riders   77
Royal Challengers Bangalore 73
Kings XI Punjab         70
Rajasthan Royals        63
Delhi Daredevils        62
Sunrisers Hyderabad     42
Deccan Chargers         29
Gujarat Lions           13
Pune Warriors           12
Rising Pune Supergiant  10
Kochi Tuskers Kerala    6
Rising Pune Supergiants 5
Name: winner, dtype: int64

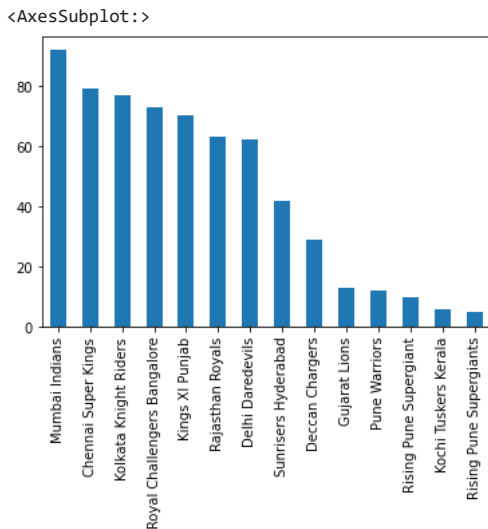
```

```

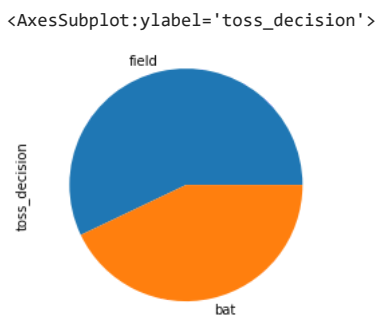
# panda plot function
import matplotlib.pyplot as plt

```

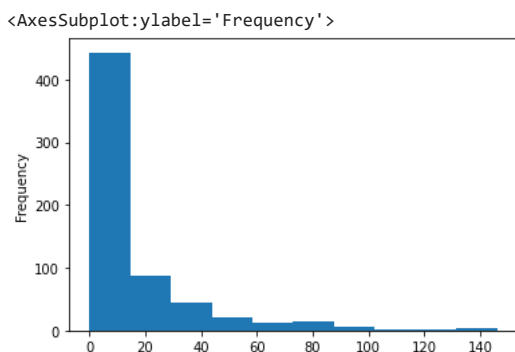
```
data['winner'].value_counts().plot(kind = 'bar')
```



```
data['toss_decision'].value_counts().plot(kind = 'pie')
```



```
data['win_by_runs'].plot(kind = 'hist')
```



```
# values function for series
#when you want to perform arithmeatic operations on series
my_series = data['winner'].value_counts()
my_series.values
```

```
array([92, 79, 77, 73, 70, 63, 62, 42, 29, 13, 12, 10,  6,  5])
```

```
my_series = data['team1'].value_counts() + data['team2'].value_count
my_series
```

```
Chennai Super Kings      131
Deccan Chargers          75
Delhi Daredevils         147
Gujarat Lions            30
Kings XI Punjab          148
Kochi Tuskers Kerala     14
Kolkata Knight Riders    148
Mumbai Indians           157
Pune Warriors            46
Rajasthan Royals         118
Rising Pune Supergiant   16
Rising Pune Supergiants  14
Royal Challengers Bangalore 152
Sunrisers Hyderabad      76
dtype: int64
```

```
my_series = (data['team1'].value_counts() + data['team2'].value_coun
my_series
```

```
Kochi Tuskers Kerala      14
Rising Pune Supergiants   14
Rising Pune Supergiant    16
Gujarat Lions             30
Pune Warriors             46
Deccan Chargers           75
Sunrisers Hyderabad       76
Rajasthan Royals          118
Chennai Super Kings       131
Delhi Daredevils          147
Kings XI Punjab           148
Kolkata Knight Riders     148
Royal Challengers Bangalore 152
Mumbai Indians            157
dtype: int64
```

```
data.sort_values('city')
#alphabateically gets sorted
```

	id	season	city	date	team1	team2	toss_winner	toss_decision	r
460	461	2014	Abu Dhabi	2014-04-18	Sunrisers Hyderabad	Rajasthan Royals	Rajasthan Royals		field
471	472	2014	Abu Dhabi	2014-04-26	Kings XI Punjab	Kolkata Knight Riders	Kolkata Knight Riders		field
470	471	2014	Abu Dhabi	2014-04-26	Royal Challengers Bangalore	Rajasthan Royals	Rajasthan Royals		field
464	465	2014	Abu Dhabi	2014-04-21	Chennai Super Kings	Delhi Daredevils	Chennai Super Kings		bat
459	460	2014	Abu Dhabi	2014-04-18	Chennai Super Kings	Kings XI Punjab	Chennai Super Kings		bat

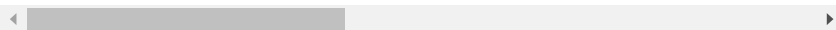
```
data1 = data.sort_values('city',ascending=False,inplace=True)
data1
```

466	467	2014	NaN	2014-04-23	Chennai Super Kings	Rajasthan Royals	Rajasthan Royals		field
-----	-----	------	-----	------------	---------------------	------------------	------------------	--	-------

```
data.sort_values(['city','date'],ascending=[True,False])
```

	id	season	city	date	team1	team2	toss_winner	toss_decision	
475	476	2014	Abu Dhabi	2014-04-29	Rajasthan Royals	Kolkata Knight Riders	Rajasthan Royals		bat
471	472	2014	Abu Dhabi	2014-04-26	Kings XI Punjab	Kolkata Knight Riders	Kolkata Knight Riders		field
470	471	2014	Abu Dhabi	2014-04-26	Royal Challengers Bangalore	Rajasthan Royals	Rajasthan Royals		field
464	465	2014	Abu Dhabi	2014-04-21	Chennai Super Kings	Delhi Daredevils	Chennai Super Kings		bat
460	461	2014	Abu Dhabi	2014-04-18	Sunrisers Hyderabad	Rajasthan Royals	Rajasthan Royals		field
...
468	469	2014	NaN	2014-04-25	Sunrisers Hyderabad	Delhi Daredevils	Sunrisers Hyderabad		bat
469	470	2014	NaN	2014-04-25	Mumbai Indians	Chennai Super Kings	Mumbai Indians		bat
466	467	2014	NaN	2014-04-23	Chennai Super Kings	Rajasthan Royals	Rajasthan Royals		field
461	462	2014	NaN	2014-04-19	Mumbai Indians	Royal Challengers Bangalore	Royal Challengers Bangalore		field
462	463	2014	NaN	2014-04-19	Kolkata Knight Riders	Delhi Daredevils	Kolkata Knight Riders		bat

636 rows × 10 columns



```
data.drop_duplicates(subset = ['city','season'])
```

	id	season	city	date	team1	team2	toss_winner	toss_de
312	313	2012	Visakhapatnam	2012-04-07	Chennai Super Kings	Deccan Chargers	Deccan Chargers	
624	625	2016	Visakhapatnam	2016-05-17	Delhi Daredevils	Rising Pune Supergiants	Rising Pune Supergiants	
536	537	2015	Visakhapatnam	2015-04-22	Sunrisers Hyderabad	Kolkata Knight Riders	Kolkata Knight Riders	
458	459	2014	Sharjah	2014-04-17	Delhi Daredevils	Royal Challengers Bangalore	Royal Challengers Bangalore	
498	499	2014	Ranchi	2014-05-18	Chennai Super Kings	Royal Challengers Bangalore	Chennai Super Kings	
...
186	187	2010	Ahmedabad	2010-03-20	Rajasthan Royals	Kolkata Knight Riders	Rajasthan Royals	
486	487	2014	Ahmedabad	2014-05-08	Sunrisers Hyderabad	Rajasthan Royals	Rajasthan Royals	
535	536	2015	Ahmedabad	2015-04-21	Rajasthan Royals	Kings XI Punjab	Kings XI Punjab	
457	458	2014	Abu Dhabi	2014-04-16	Kolkata Knight Riders	Mumbai Indians	Kolkata Knight Riders	
461	462	2014	NaN	2014-04-19	Mumbai Indians	Royal Challengers Bangalore	Royal Challengers Bangalore	

```
data.drop_duplicates('season',keep='last')[['season','winner']]
```

	season	winner
164	2009	Delhi Daredevils
69	2008	Rajasthan Royals
44	2017	Kolkata Knight Riders
311	2012	Royal Challengers Bangalore
241	2011	Mumbai Indians
406	2013	Royal Challengers Bangalore
579	2016	Royal Challengers Bangalore
197	2010	Rajasthan Royals
532	2015	Rajasthan Royals
476	2014	Sunrisers Hyderabad

```
sectors = data.groupby('winner')
sectors.size()
```

winner	
Chennai Super Kings	79
Deccan Chargers	29
Delhi Daredevils	62
Gujarat Lions	13
Kings XI Punjab	70
Kochi Tuskers Kerala	6
Kolkata Knight Riders	77
Mumbai Indians	92
Pune Warriors	12

```
Rajasthan Royals          63
Rising Pune Supergiant    10
Rising Pune Supergiants   5
Royal Challengers Bangalore 73
Sunrisers Hyderabad       42
dtype: int64
```

```
# returns first value of each sector
sectors.first()
# returns last value of each sector
sectors.last()
```

	id	season	city	date	team1	team2	toss_winner
winner							
Chennai Super Kings	470	2014	Abu Dhabi	2014-04-25	Mumbai Indians	Chennai Super Kings	Mumbai Indians
Deccan Chargers	214	2010	Bangalore	2010-04-08	Royal Challengers Bangalore	Deccan Chargers	Deccan Chargers
Delhi Daredevils	463	2014	Ahmedabad	2014-04-19	Kolkata Knight Riders	Delhi Daredevils	Kolkata Knight Riders
Gujarat Lions	30	2017	Bangalore	2017-04-27	Royal Challengers Bangalore	Gujarat Lions	Gujarat Lions
Kings XI Punjab	475	2014	Abu Dhabi	2014-04-28	Royal Challengers Bangalore	Kings XI Punjab	Kings XI Punjab
Kochi Tuskers Kerala	274	2011	Delhi	2011-05-02	Delhi Daredevils	Kochi Tuskers Kerala	Kochi Tuskers Kerala
Kolkata Knight Riders	458	2014	Abu Dhabi	2014-04-16	Kolkata Knight Riders	Mumbai Indians	Kolkata Knight Riders
Mumbai Indians	501	2014	Ahmedabad	2014-05-19	Mumbai Indians	Rajasthan Royals	Mumbai Indians
Pune Warriors	284	2011	Chandigarh	2011-05-08	Kings XI Punjab	Pune Warriors	Kings XI Punjab
Rajasthan Royals	461	2014	Abu Dhabi	2014-04-18	Sunrisers Hyderabad	Rajasthan Royals	Rajasthan Royals
Rising Pune Supergiant	17	2017	Bangalore	2017-04-16	Rising Pune Supergiant	Royal Challengers Bangalore	Royal Challengers Bangalore
Rising Pune Supergiants	609	2016	Delhi	2016-05-05	Delhi Daredevils	Rising Pune Supergiants	Rising Pune Supergiants
Royal Challenaers	462	2014	Ahmedabad	2014-	Mumbai	Royal Challenaers	Royal Challenaers

```
sectors.groups
```

```
{'Chennai Super Kings': [312, 473, 574, 493, 477, 421, 121, 161, 115, 231, 303, 529, 489, 233, 263, 514, 367, 102, 181, 405, 151, 140, 284, 360, 113, 434, 143, 168, 227, 403, 86, 453, 184, 482, 395, 417, 205, 210, 424, 413, 66, 409, 541, 351, 70, 90, 333, 562, 445, 331, 288, 234, 319, 306, 247, 296, 518, 221, 553, 261, 379, 546, 271, 275, 520, 363, 201, 568, 60, 390, 148, 136, 378, 537, 509, 73, 464, 466, 469], 'Deccan Chargers': [340, 219, 215, 71, 294, 291, 264, 154, 173, 162, 244, 372, 375, 130, 127, 299, 224,
```



```
252, 228, 347, 188, 185, 178, 84, 146, 171, 123, 120, 213], 'Delhi Daredevils': [530, 472, 606, 423, 418, 627, 564, 338, 527, 8,
128, 326, 249, 308, 268, 48, 153, 348, 278, 65, 330, 617, 149, 145, 157, 124, 373, 322, 108, 344, 75, 258, 601, 368, 341, 50, 14,
538, 582, 547, 202, 208, 38, 407, 97, 40, 199, 592, 317, 61, 223, 78, 176, 135, 169, 119, 164, 103, 586, 196, 179, 462], 'Gujarat
Lions': [594, 12, 581, 600, 584, 613, 22, 626, 629, 598, 45, 578, 29], 'Kings XI Punjab': [618, 463, 465, 603, 25, 386, 141, 105,
523, 515, 335, 49, 324, 207, 150, 163, 289, 3, 7, 76, 248, 495, 358, 126, 134, 295, 411, 449, 370, 292, 501, 442, 99, 217, 485,
189, 342, 447, 320, 399, 214, 408, 47, 96, 107, 80, 611, 68, 93, 286, 34, 565, 511, 508, 72, 255, 242, 365, 585, 129, 160, 83,
487, 349, 41, 428, 535, 471, 459, 474], 'Kochi Tuskers Kerala': [246, 254, 277, 251, 293, 273], 'Kolkata Knight Riders': [467,
440, 2, 595, 28, 374, 377, 436, 531, 369, 174, 297, 177, 505, 503, 13, 526, 10, 517, 396, 630, 607, 280, 559, 510, 111, 620, 426,
343, 30, 554, 250, 94, 544, 226, 87, 352, 203, 321, 414, 212, 269, 513, 381, 26, 63, 577, 239, 229, 245, 274, 91, 499, 583, 167,
122, 356, 534, 265, 17, 484, 336, 490, 496, 380, 346, 329, 195, 588, 165, 316, 516, 605, 59, 56, 44, 457], 'Mumbai Indians': [315,
622, 33, 350, 604, 438, 152, 131, 81, 95, 304, 572, 420, 200, 512, 281, 198, 318, 206, 98, 15, 599, 566, 555, 548, 85, 540, 416,
276, 507, 483, 478, 589, 9, 354, 23, 175, 446, 345, 443, 6, 36, 394, 272, 433, 190, 220, 389, 230, 193, 253, 429, 256, 52, 456,
455, 302, 412, 362, 580, 74, 575, 376, 218, 21, 259, 101, 58, 571, 492, 137, 237, 182, 43, 385, 558, 307, 596, 551, 339, 504, 156,
117, 366, 89, 533, 11, 616, 57, 225, 241, 500], 'Pune Warriors': [444, 323, 314, 450, 392, 309, 243, 238, 285, 334, 398, 283],
'Rajasthan Royals': [528, 357, 519, 139, 209, 116, 114, 298, 552, 569, 104, 92, 100, 432, 112, 313, 430, 419, 397, 240, 388, 415,
211, 327, 310, 364, 82, 266, 88, 270, 260, 64, 441, 402, 77, 235, 67, 159, 144, 454, 384, 522, 479, 109, 192, 435, 353, 132, 147,
125, 325, 491, 69, 186, 194, 481, 197, 497, 525, 532, 475, 470, 460], 'Rising Pune Supergiant': [32, 53, 1, 37, 24, 55, 27, 39,
42, 16], 'Rising Pune Supergiants': [624, 628, 576, 597, 608], 'Royal Challengers Bangalore': [458, 498, 19, 631, 591, 425, 573,
361, 62, 561, 187, 232, 359, 521, 623, 257, 236, 172, 166, 142, 222, 337, 287, 79, 567, 133, 158, 138, 371, 262, 54, 437, 542,
305, 106, 614, 332, 204, 170, 155, 118, 282, 180, 301, 328, 382, 290, 355, 267, 451, 480, 279, 391, 556, 549, 110, 494, 619, 400,
610, 625, 191, 4, 632, 311, 431, 183, 410, 406, 216, 579, 539, 461], 'Sunrisers Hyderabad': [536, 615, 612, 506, 590, 560, 401,
557, 51, 20, 0, 609, 18, 5, 35, 46, 422, 427, 587, 387, 550, 383, 593, 448, 563, 452, 404, 502, 602, 633, 393, 488, 634, 439, 543,
31, 621, 524, 635, 486, 468, 476]}
```

sectors.get_group('Deccan Chargers')

	id	season	city	date	team1	team2	toss_winner	toss_
340	341	2012	Pune	2012-04-26	Deccan Chargers	Pune Warriors	Deccan Chargers	
219	220	2010	Nagpur	2010-04-12	Deccan Chargers	Royal Challengers Bangalore	Royal Challengers Bangalore	
215	216	2010	Nagpur	2010-04-10	Chennai Super Kings	Deccan Chargers	Chennai Super Kings	
71	72	2008	Mumbai	2008-04-27	Mumbai Indians	Deccan Chargers	Deccan Chargers	
294	295	2011	Mumbai	2011-05-16	Pune Warriors	Deccan Chargers	Deccan Chargers	
291	292	2011	Mumbai	2011-05-14	Deccan Chargers	Mumbai Indians	Deccan Chargers	
264	265	2011	Kochi	2011-04-27	Deccan Chargers	Kochi Tuskers Kerala	Kochi Tuskers Kerala	
154	155	2009	Kimberley	2009-05-11	Deccan Chargers	Rajasthan Royals	Deccan Chargers	
173	174	2009	Johannesburg	2009-05-24	Deccan Chargers	Royal Challengers Bangalore	Royal Challengers Bangalore	
162	163	2009	Johannesburg	2009-05-16	Kolkata Knight Riders	Deccan Chargers	Deccan Chargers	
244	245	2011	Hyderabad	2011-04-14	Deccan Chargers	Royal Challengers Bangalore	Royal Challengers Bangalore	
372	373	2012	Hyderabad	2012-05-18	Rajasthan Royals	Deccan Chargers	Rajasthan Royals	
375	376	2012	Hyderabad	2012-05-20	Deccan Chargers	Royal Challengers Bangalore	Royal Challengers Bangalore	

```
# find top 5 batsman and for this we need delivery.csv as well
delivery = pd.read_csv('/content/deliveries.csv')
delivery.head()
```

	match_id	inning	batting_team	bowling_team	over	ball	batsman	non_striker
0	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	1	1	DA Warner	S Dhawan
1	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	1	2	DA Warner	S Dhawan
2	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	1	3	DA Warner	S Dhawan
3	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	1	4	DA Warner	S Dhawan
4	1	1	Sunrisers Hyderabad	Royal Challengers Bangalore	1	5	DA Warner	S Dhawan

5 rows × 21 columns

```
delivery.head(2)
runs = delivery.groupby('batsman')
runs['batsman_runs'].sum().sort_values(ascending=False).head()
```

```
batsman
SK Raina      4548
V Kohli       4423
RG Sharma     4207
G Gambhir     4132
DA Warner     4014
Name: batsman_runs, dtype: int64
```

```
# code to see against what time did suppose virat kohli scored the m
vk = delivery[delivery['batsman']=='V Kohli']
vk.groupby('bowling_team')['batsman_runs'].sum().sort_values(ascendi
```

```
bowling_team
Chennai Super Kings    706
Delhi Daredevils       661
Kings XI Punjab        483
Mumbai Indians         447
Sunrisers Hyderabad    439
Name: batsman_runs, dtype: int64
```

▼ Merge Function

```
import pandas as pd
```

```
left = pd.DataFrame({'id':[1,2,3], 'Name':['Vrushali','Soham','Sushi']
right = pd.DataFrame({'id':[1,2,3], 'Name':['Prathamesh','Sami','Piy
```

```
print(left,'\n',right)
```

```
id      Name
0  1  Vrushali
1  2    Soham
2  3    Sushi

id      Name
0  1 Prathamesh
1  2     Sami
2  3    Piyush
```

```
pd.merge(left,right,on='id')
```

```
id  Name_x  Name_y
0  1  Vrushali  Prathamesh
1  2    Soham    Sami
2  3    Sushi   Piyush
```

▼ IsIn

```
new = delivery['batsman'].isin(['S Dhawan'])
print(pd.DataFrame(delivery[new]))
```

```
match_id  inning  batting_team  bowling_team \
5          1        1  Sunrisers Hyderabad  Royal Challengers Bangalore
6          1        1  Sunrisers Hyderabad  Royal Challengers Bangalore
7          1        1  Sunrisers Hyderabad  Royal Challengers Bangalore
14         1        1  Sunrisers Hyderabad  Royal Challengers Bangalore
18         1        1  Sunrisers Hyderabad  Royal Challengers Bangalore
...       ...      ...              ...
150245    636      1  Sunrisers Hyderabad  Royal Challengers Bangalore
```

```

150246      636      1  Sunrisers Hyderabad  Royal Challengers Bangalore
150248      636      1  Sunrisers Hyderabad  Royal Challengers Bangalore
150250      636      1  Sunrisers Hyderabad  Royal Challengers Bangalore
150251      636      1  Sunrisers Hyderabad  Royal Challengers Bangalore

over  ball  batsman  non_striker  bowler  is_super_over  ...  \
5      1      6  S Dhawan      DA Warner      TS Mills      0  ...
6      1      7  S Dhawan      DA Warner      TS Mills      0  ...
7      2      1  S Dhawan      DA Warner      A Choudhary     0  ...
14     3      1  S Dhawan      MC Henriques    TS Mills      0  ...
18     3      5  S Dhawan      MC Henriques    TS Mills      0  ...
...     ...     ...     ...     ...     ...     ...
150245     6      5  S Dhawan      DA Warner      CH Gayle      0  ...
150246     6      6  S Dhawan      DA Warner      CH Gayle      0  ...
150248     7      1  S Dhawan      DA Warner      YS Chahal     0  ...
150250     7      3  S Dhawan      DA Warner      YS Chahal     0  ...
150251     7      4  S Dhawan      DA Warner      YS Chahal     0  ...

bye_runs  legbye_runs  noball_runs  penalty_runs  batsman_runs  \
5           0           0           0           0           0
6           0           1           0           0           0
7           0           0           0           0           1
14          0           0           0           0           1
18          0           0           0           0           1
...         ...         ...         ...         ...         ...
150245      0           0           0           0           0
150246      0           0           0           0           1
150248      0           0           0           0           1
150250      0           0           0           0           2
150251      0           0           0           0           0

extra_runs  total_runs  player_dismissed  dismissal_kind  fielder
5           0           0                NaN            NaN      NaN
6           1           1                NaN            NaN      NaN
7           0           1                NaN            NaN      NaN
14          0           1                NaN            NaN      NaN
18          0           1                NaN            NaN      NaN
...         ...         ...                ...            ...      ...
150245      0           0                NaN            NaN      NaN
150246      0           1                NaN            NaN      NaN
150248      0           1                NaN            NaN      NaN
150250      0           2                NaN            NaN      NaN
150251      0           0              S Dhawan      caught  CJ Jordan

```

[3005 rows x 21 columns]

▼ Pivot Table

```

mask = delivery['batsman_runs'] == 6
six = delivery[mask]
six.shape

```

(6523, 21)

```

pt = six.pivot_table(index = 'over', columns='batting_team', values=

```

```

import seaborn as sns
sns.heatmap(pt)

```