```python
from google.colab import files
uploaded = files.upload()
```

Choose Files 2 files
- **deliveries.csv**(text/csv) - 484206 bytes, last modified: 4/6/2025 - 100% done
- **matches.csv**(text/csv) - 2753 bytes, last modified: 4/6/2025 - 100% done
Saving deliveries.csv to deliveries.csv
Saving matches.csv to matches.csv

```python
import pandas as pd

matches = pd.read_csv('matches.csv')
deliveries = pd.read_csv('deliveries.csv')

# Show first few rows
matches.head()
```

	match_id	date	venue	team1	team2	stage	toss_winner	toss_decision	first_ings_score	first_ings_wkts	second_ings_sco
0	1	March 22,2025	Eden Gardens, Kolkata	KKR	RCB	League	RCB	Bowl	174	8	
1	2	March 23,2025	Rajiv Gandhi International Stadium, Hyderabad	SRH	RR	League	RR	Bowl	286	6	
2	3	March 23,2025	MA Chidambaram Stadium, Chennai	CSK	MI	League	CSK	Bowl	155	9	
3	4	March 24,2025	ACA-VDCA Cricket Stadium, Vishakhapatnam	DC	LSG	League	DC	Bowl	209	8	
4	5	March 25,2025	Narendra Modi Stadium, Ahmedabad	GT	PBKS	League	GT	Bowl	243	5	

Next steps: [Generate code with `matches`] [🔘 View recommended plots] [New interactive sheet]

```python
# Extract runs_of_bat column as a Series
runs_series = deliveries['runs_of_bat']
print(type(runs_series))
print(runs_series.head())
```

```
<class 'pandas.core.series.Series'>
0    0
1    4
2    0
3    0
4    0
Name: runs_of_bat, dtype: int64
```

```python
print(type(deliveries))
print(deliveries.head())
```

```
<class 'pandas.core.frame.DataFrame'>
   match_no         date         stage                   venue batting_team  \
0         1  Mar 22, 2025  League stage  Eden Gardens, Kolkata          KKR
1         1  Mar 22, 2025  League stage  Eden Gardens, Kolkata          KKR
2         1  Mar 22, 2025  League stage  Eden Gardens, Kolkata          KKR
3         1  Mar 22, 2025  League stage  Eden Gardens, Kolkata          KKR
4         1  Mar 22, 2025  League stage  Eden Gardens, Kolkata          KKR

  bowling_team  innings  over  striker     bowler  runs_of_bat  extras  wide  \
0          RCB        1   0.1  de Kock  Hazlewood            0       0     0
1          RCB        1   0.2  de Kock  Hazlewood            4       0     0
2          RCB        1   0.3  de Kock  Hazlewood            0       0     0
3          RCB        1   0.4  de Kock  Hazlewood            0       0     0
4          RCB        1   0.5  de Kock  Hazlewood            0       0     0
```

```
       legbyes   byes   noballs   wicket_type  player_dismissed        fielder
0            0      0         0           NaN               NaN            NaN
1            0      0         0           NaN               NaN            NaN
2            0      0         0           NaN               NaN            NaN
3            0      0         0           NaN               NaN            NaN
4            0      0         0        caught           de Kock  Jitesh Sharma
```

```python
print(runs_series[0:5])        # Positional indexing
print(runs_series.iloc[0:5])   # Same using iloc
```

```
0    0
1    4
2    0
3    0
4    0
Name: runs_of_bat, dtype: int64
0    0
1    4
2    0
3    0
4    0
Name: runs_of_bat, dtype: int64
```

```python
# Select single column
deliveries['striker']

# Select multiple columns
deliveries[['striker', 'bowler']].head()

# Row by position
deliveries.iloc[0]

# Row by condition
deliveries[deliveries['runs_of_bat'] == 6].head()
```

	match_no	date	stage	venue	batting_team	bowling_team	innings	over	striker	bowler	runs_of_bat	extras	wide	legbyes	bye:
20	1	Mar 22, 2025	League stage	Eden Gardens, Kolkata	KKR	RCB	1	3.3	Rahane	Rasikh Salam	6	0	0	0	(
22	1	Mar 22, 2025	League stage	Eden Gardens, Kolkata	KKR	RCB	1	3.5	Rahane	Rasikh Salam	6	0	0	0	(
24	1	Mar 22, 2025	League stage	Eden Gardens, Kolkata	KKR	RCB	1	4.1	Narine	Krunal Pandya	6	0	0	0	(
33	1	Mar 22, 2025	League stage	Eden Gardens, Kolkata	KKR	RCB	1	5.4	Rahane	Yash Dayal	6	0	0	0	(
51	1	Mar 22, 2025	League stage	Eden Gardens, Kolkata	KKR	RCB	1	8.1	Rahane	Suyash Sharma	6	0	0	0	(

```python
# Apply NumPy ufunc on Series
import numpy as np
np.sqrt(deliveries['runs_of_bat']).head()
```

	runs_of_bat
0	0.0
1	2.0
2	0.0
3	0.0
4	0.0

dtype: float64

```python
# Create two Series
s1 = pd.Series([100, 200, 300], index=['Kohli', 'Dhoni', 'Rohit'])
s2 = pd.Series([50, 100, 150], index=['Kohli', 'Rohit', 'Rahul'])

# Automatic alignment on index
s1 + s2
```

	0
Dhoni	NaN
Kohli	150.0
Rahul	NaN
Rohit	400.0

dtype: float64

```python
# Check for missing values
print(deliveries.isnull().sum())

# Drop rows with missing values
deliveries_clean = deliveries.dropna()

# Fill missing values
deliveries_filled = deliveries.fillna(0)
```

```
match_no              0
date                  0
stage                 0
venue                 0
batting_team          0
bowling_team          0
innings               0
over                  0
striker               0
bowler                0
runs_of_bat           0
extras                0
wide                  0
legbyes               0
byes                  0
noballs               0
wicket_type        3571
player_dismissed   3571
fielder            3612
dtype: int64
```

```python
# Check if any null in a row
deliveries[deliveries.isnull().any(axis=1)].head()

# Replace NaN in a specific column
deliveries['fielder'].fillna('No Fielder', inplace=True)
```

```
<ipython-input-10-2f69544ef52e>:5: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignm
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting valu

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].me

  deliveries['fielder'].fillna('No Fielder', inplace=True)
```

```python
multi_df = deliveries.set_index(['match_no', 'innings'])
print(multi_df.head())

# Access data using multi-index
print(multi_df.loc[(1, 1)].head())  # Match 1, innings 1
```

```
                  batting_team bowling_team  over  striker      bowler  \
match_no innings
1        1                 KKR          RCB   0.1  de Kock  Hazlewood
         1                 KKR          RCB   0.2  de Kock  Hazlewood
         1                 KKR          RCB   0.3  de Kock  Hazlewood
         1                 KKR          RCB   0.4  de Kock  Hazlewood
         1                 KKR          RCB   0.5  de Kock  Hazlewood

                  runs_of_bat  extras  wide  legbyes  byes  noballs  \
match_no innings
1        1                  0       0     0        0     0        0
         1                  4       0     0        0     0        0
         1                  0       0     0        0     0        0
         1                  0       0     0        0     0        0
         1                  0       0     0        0     0        0

                  wicket_type player_dismissed        fielder
match_no innings
1        1                NaN              NaN     No Fielder
         1                NaN              NaN     No Fielder
         1                NaN              NaN     No Fielder
         1                NaN              NaN     No Fielder
         1             caught          de Kock  Jitesh Sharma
                         date         stage                  venue  \
match_no innings
1        1          Mar 22, 2025  League stage  Eden Gardens, Kolkata
         1          Mar 22, 2025  League stage  Eden Gardens, Kolkata
         1          Mar 22, 2025  League stage  Eden Gardens, Kolkata
         1          Mar 22, 2025  League stage  Eden Gardens, Kolkata
         1          Mar 22, 2025  League stage  Eden Gardens, Kolkata

                  batting_team bowling_team  over  striker      bowler  \
match_no innings
1        1                 KKR          RCB   0.1  de Kock  Hazlewood
         1                 KKR          RCB   0.2  de Kock  Hazlewood
         1                 KKR          RCB   0.3  de Kock  Hazlewood
         1                 KKR          RCB   0.4  de Kock  Hazlewood
         1                 KKR          RCB   0.5  de Kock  Hazlewood

                  runs_of_bat  extras  wide  legbyes  byes  noballs  \
match_no innings
1        1                  0       0     0        0     0        0
         1                  4       0     0        0     0        0
         1                  0       0     0        0     0        0
         1                  0       0     0        0     0        0
         1                  0       0     0        0     0        0

                  wicket_type player_dismissed        fielder
match_no innings
1        1                NaN              NaN     No Fielder
         1                NaN              NaN     No Fielder
         1                NaN              NaN     No Fielder
         1                NaN              NaN     No Fielder
         1             caught          de Kock  Jitesh Sharma
```

```python
runs_per_match = deliveries.groupby('match_no')['runs_of_bat'].sum()
print(runs_per_match.head())
```

```
match_no
1    342
2    497
3    298
4    405
5    449
Name: runs_of_bat, dtype: int64
```