Mr.360 Against Bumrah Batsman Against Bowler

1. understanding the importance of Matchups
2. Getting the req Data
3. Pre-processing the data
4. create insightful visulisation
5. conclusion

```
# Opensourse for checking Matchups
   # cric metric
```

```
# Data is collected from CRICSHEET.org
```

```
import warnings
warnings.filterwarnings('ignore')

import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

# to display all rows columns
pd.set_option('display.max_rows', None)
pd.set_option('display.max_columns', None)
pd.set_option('display.expand_frame_repr', False)
pd.set_option('max_colwidth', -1)
```

```
# ipl_ball_by_ball_updated.csv
```

```
df = pd.read_csv('IPL_ball_by_ball_updated.csv')
```

```
len(df)
```

```
    208041
```

```
df.head(1)
```

	match_id	season	start_date	venue	innings	ball	batting_team	bowling_t
0	335982	2008	2008-04-18	M Chinnaswamy	2	6.8	Royal Challengers	Kolkata Kr Ri

```
# Match id is the id for perticular match
```

```
df.innings.unique()
```

```
array([2, 1, 4, 3, 6, 5])
```

two innings are here. and 4 super overs. it means double super data

```
df = df[(df.innings == 1) | (df.innings == 2)]
```

```
df.innings.unique()
```

```
array([2, 1])
```

what are the numbers when ABD faces Bumrah?

step1: filter by player name

stsp2: use these names & assign it to a striker & bowler

step3: get the req coloums

```
df.bowling_team.unique()
# .unique() => gives list of bowling teams  in that column
```

```
array(['Kolkata Knight Riders', 'Royal Challengers Bangalore',
       'Delhi Daredevils', 'Chennai Super Kings', 'Rajasthan Royals',
       'Kings XI Punjab', 'Mumbai Indians', 'Deccan Chargers',
       'Kochi Tuskers Kerala', 'Pune Warriors', 'Sunrisers Hyderabad',
       'Rising Pune Supergiants', 'Gujarat Lions',
       'Rising Pune Supergiant', 'Delhi Capitals', 'Punjab Kings'],
      dtype=object)
```

```
df[df.bowling_team == 'Mumbai Indians']['bowler'].unique()
# bowling team list
```

```
array(['DS Kulkarni', 'Harbhajan Singh', 'A Nehra', 'AM Nayar',
       'ST Jayasuriya', 'SM Pollock', 'MA Khote', 'DJ Bravo',
       'VS Yeligati', 'SD Chitnis', 'CRD Fernando', 'DJ Thornely',
       'RR Raje', 'DR Smith', 'A Nel', 'SL Malinga', 'Z Khan',
       'SR Tendulkar', 'JP Duminy', 'GR Napier', 'C Nanda', 'AM Rahane',
       'RA Shaikh', 'R McLaren', 'R Sathish', 'AG Murtaza', 'KA Pollard',
       'AN Ahmed', 'STR Binny', 'JEC Franklin', 'MM Patel', 'RG Sharma',
       'A Symonds', 'TL Suman', 'RW Price', 'PP Ojha', 'RP Singh',
       'CJ McKay', 'NLTC Perera', 'RJ Peterson', 'R Shukla', 'JJ Bumrah',
       'MG Johnson', 'JDP Oram', 'R Dhawan', 'YS Chahal', 'P Suyal',
       'GJ Maxwell', 'NM Coulter-Nile', 'CJ Anderson', 'P Kumar',
       'LMP Simmons', 'S Gopal', 'K Santokie', 'M de Lange',
       'R Vinay Kumar', 'J Suchith', 'MJ McClenaghan', 'HH Pandya',
       'TG Southee', 'KH Pandya', 'N Rana', 'KV Sharma', 'M Markande',
       'Mustafizur Rahman', 'PJ Sangwan', 'BCJ Cutting', 'A Dananjaya',
       'Rasikh Salam', 'RD Chahar', 'JP Behrendorff', 'AS Joseph',
       'J Yadav', 'AS Roy', 'BB Sran', 'TA Boult', 'JL Pattinson',
       'M Jansen', 'AF Milne', 'JDS Neesham', 'PP Chawla'], dtype=object)
```

```
# df[df.bowling_team == 'Mumbai Indians']['bowler']
```

```
#player1 - JJ Bumrah
```

```
df[df.batting_team == 'Royal Challengers Bangalore']['striker'].unique()
# df[df.batting_team == 'Royal Challengers Bangalore'] => this selects the team in Royal c
```

```
array(['MV Boucher', 'W Jaffer', 'JH Kallis', 'CL White', 'V Kohli',
       'R Dravid', 'P Kumar', 'Z Khan', 'SB Joshi', 'AA Noffke',
       'B Akhil', 'LRPL Taylor', 'S Chanderpaul', 'R Vinay Kumar',
       'B Chipli', 'DW Steyn', 'Misbah-ul-Haq', 'DT Patil', 'A Kumble',
       'J Arunkumar', 'Abdur Razzak', 'SP Goswami', 'KP Pietersen',
       'RV Uthappa', 'JD Ryder', 'R Bishnoi', 'KV Sharma', 'Pankaj Singh',
       'MK Pandey', 'RE van der Merwe', 'KP Appanna', 'D du Preez',
       'EJG Morgan', 'A Mithun', 'S Sriram', 'AUK Pathan',
       'AB de Villiers', 'TM Dilshan', 'SS Tiwary', 'MA Agarwal',
       'DL Vettori', 'CA Pujara', 'JJ van der Wath', 'R Ninan',
       'S Aravind', 'CH Gayle', 'J Syed Mohammad', 'M Kaif',
       'LA Pomersbach', 'KB Arun Karthik', 'CK Langeveldt', 'AB McDonald',
       'HV Patel', 'RR Bhatkal', 'M Muralitharan', 'P Parameswaran',
       'KK Nair', 'DT Christian', 'MC Henriques', 'M Kartik',
       'JD Unadkat', 'R Rampaul', 'KL Rahul', 'A Mukund', 'Yuvraj Singh',
       'PA Patel', 'NJ Maddinson', 'JA Morkel', 'YV Takawale', 'MA Starc',
       'AB Dinda', 'S Rana', 'VR Aaron', 'RR Rossouw', 'YS Chahal',
       'VH Zol', 'AN Ahmed', 'KD Karthik', 'Mandeep Singh', 'DJG Sammy',
       'SA Abbott', 'D Wiese', 'Iqbal Abdulla', 'MS Bisla', 'SN Khan',
       'KM Jadhav', 'SR Watson', 'TM Head', 'KW Richardson', 'STR Binny',
       'Sachin Baby', 'Parvez Rasool', 'CJ Jordan', 'TS Mills',
       'A Choudhary', 'P Negi', 'Vishnu Vinod', 'AF Milne', 'S Badree',
       'CR Woakes', 'BB McCullum', 'Q de Kock', 'Washington Sundar',
       'CJ Anderson', 'UT Yadav', 'Mohammed Siraj', 'M Vohra',
       'C de Grandhomme', 'TG Southee', 'M Ashwin', 'MM Ali',
       'SO Hetmyer', 'S Dube', 'NA Saini', 'P Ray Barman', 'MP Stoinis',
       'AD Nath', 'Gurkeerat Singh', 'H Klaasen', 'D Padikkal',
       'JR Philippe', 'AJ Finch', 'I Udana', 'CH Morris', 'Shahbaz Ahmed',
       'GJ Maxwell', 'RM Patidar', 'KA Jamieson', 'DR Sams', 'KS Bharat',
       'PWH de Silva', 'TH David', 'GHS Garton'], dtype=object)
```

```
df[df.batting_team == 'Royal Challengers Bangalore'].head()
# this selects the team in Royal challengers bangalore
```

	match_id	season	start_date	venue	innings	ball	batting_team	bowling_t
0	335982	2008	2008-04-18	M Chinnaswamy Stadium	2	6.8	Royal Challengers Bangalore	Kolkata Kr Ri
1	335982	2008	2008-04-18	M Chinnaswamy Stadium	2	2.7	Royal Challengers Bangalore	Kolkata Kr Ri
2	335982	2008	2008-04-18	M Chinnaswamy Stadium	2	3.1	Royal Challengers Bangalore	Kolkata Kr Ri
3	335982	2008	2008-04-18	M Chinnaswamy Stadium	2	3.2	Royal Challengers Bangalore	Kolkata Kr Ri
4	335982	2008	2008-04-18	M Chinnaswamy Stadium	2	3.3	Royal Challengers Bangalore	Kolkata Kr Ri

```
#Player 2: AB de Villers


req_df = df[(df.striker == 'AB de Villiers') & (df.bowler == 'JJ Bumrah')]


req_df.head()
```

	match_id	season	start_date	venue	innings	ball	batting_team	bowlin
95691	729287	2014	2014-04-19	Dubai International Cricket Stadium	2	6.1	Royal Challengers Bangalore	
95692	729287	2014	2014-04-19	Dubai International C...	2	6.2	Royal Challengers	

```
len(req_df)
```

```
86
```

| **95695** | 729287 | 2014 | 2014-04-19 | Cricket | 2 | 6.4 | Challengers | |

```
# Req Columns
"""
No. of runs scored
no. of balls faces
no. of times dismissed
"""
```

```
'\nNo. of runs scored\nno. of balls faces\nno. of times dismissed\n'
```

| | | | | Stadium | | | Bangalore | |

```
req_df.runs_off_bat
```

```
95691     2
95692     1
95695     1
95928     0
95942     6
95943     0
95944     1
95946     0
100873    0
100874    0
100875    0
112402    0
119405    6
119406    6
119407    0
119408    1
119467    1
119472    1
119480    0
119504    2
119505    1
119522    1
119524    4
119525    2
119526    2
125636    1
125638    1
132075    1
132076    0
132077    0
132078    0
132079    0
```

```
132080     0
132099     1
139430     1
139431     6
139433     1
166261     1
166273     0
166276     0
166277     1
166304     1
166306     1
166308     0
166309     0
172149     0
172151     4
172152     0
172153     0
172200     0
172201     0
172206     0
172212     3
172215     1
172225     4
172226     4
172227     0
172228     0
```

```
# No. of runs
sum(req_df.runs_off_bat)
```

```
    125
```

```
# No. of Balls
len(req_df)
```

```
    86
```

```
req_df[req_df.player_dismissed == 'AB de Villiers']
```

	match_id	season	start_date	venue	innings	ball	batting_team	bowl
100873	733983	2014	2014-05-06	Wankhede Stadium	2	12.4	Royal Challengers Bangalore	
112402	829737	2015	2015-04-19	M Chinnaswamy Stadium	2	14.2	Royal Challengers Bangalore	
202698	1254108	2021	2021-09-26	Dubai International Cricket Stadium	1	18.5	Royal Challengers Bangalore	

```
len(req_df[req_df.player_dismissed == 'AB de Villiers'])
```

    3

```
# SR
100*sum(req_df.runs_off_bat)/len(req_df)
```

    145.34883720930233

```
# comparing against all batsman Bumrah has bowled to
```

```
df.head(1)
```

	match_id	season	start_date	venue	innings	ball	batting_team	bowling_t
0	335982	2008	2008-04-18	M Chinnaswamy Stadium	2	6.8	Royal Challengers Bangalore	Kolkata Kr Ri

🪄

```
bumrah_df = df[df.bowler == 'JJ Bumrah']
# a data when bumrah is bowling
```

```
bumrah_df.head()
```

match_id	season	start_date	venue	innings	ball	batting_team	bowli

```
# runs scored by this batsman
bdf1 = bumrah_df.groupby('striker')['runs_off_bat'].sum()
# "groupby" is grouping the scores of each batsman score
```

M   Rov

```
bdf1
# there is no index here
```

```
striker
A Mishra                    1
AB de Villiers            125
AD Nath                     4
AD Russell                 51
AJ Finch                   24
AJ Turner                   0
AJ Tye                     11
AK Markram                  2
AM Rahane                  43
AR Patel                   21
AS Rajpoot                  5
AT Carey                   10
AT Rayudu                  48
Abdul Samad                20
Abhishek Sharma             8
B Kumar                     7
BA Stokes                  27
BB McCullum                39
BCJ Cutting                 5
BE Hendricks                0
BJ Hodge                   12
Basil Thampi                1
C Munro                     1
C Sakariya                  1
C de Grandhomme             2
CA Ingram                   3
CA Lynn                    33
CA Pujara                   4
CH Gayle                   37
CH Morris                  15
CJ Anderson                 1
CJ Jordan                   1
CR Woakes                   6
D Padikkal                  8
D Wiese                     8
DA Miller                  27
DA Warner                  54
DJ Bravo                   34
DJ Hooda                   23
DJ Hussey                  13
DJM Short                   4
DL Chahar                   6
DPMD Jayawardene           10
DR Sams                     0
DR Smith                   28
DS Kulkarni                 5
DT Christian                6
```

```
E Lewis                 9
EJG Morgan             12
F du Plessis           58
G Gambhir              29
GJ Bailey              17
GJ Maxwell             44
Gurkeerat Singh         2
HM Amla                13
HV Patel               10
Harbhajan Singh         1
```

```
bdf1 = pd.DataFrame(bumrah_df.groupby('striker')['runs_off_bat'].sum())
```

```
bdf1
```

```
E Lewis                 9
EJG Morgan             12
F du Plessis           58
G Gambhir              29
GJ Bailey              17
GJ Maxwell             44
Gurkeerat Singh         2
HM Amla                13
HV Patel               10
```

striker	runs_off_bat
A Mishra	1
AB de Villiers	125
AD Nath	4
AD Russell	51
AJ Finch	24
AJ Turner	0
AJ Tye	11
AK Markram	2
AM Rahane	43
AR Patel	21
AS Rajpoot	5
AT Carey	10
AT Rayudu	48
Abdul Samad	20
Abhishek Sharma	8
B Kumar	7
BA Stokes	27
BB McCullum	39
BCJ Cutting	5
BE Hendricks	0
BJ Hodge	12
Basil Thampi	1
C Munro	1
C Sakariya	1
C de Grandhomme	2
CA Ingram	3
CA Lynn	33
CA Pujara	4
CH Gayle	37
CH Morris	15
CJ Anderson	1
CJ Jordan	1

CJ Jordan	1
CR Woakes	6
D Padikkal	8
D Wiese	8
DA Miller	27
DA Warner	54
DJ Bravo	34
DJ Hooda	23
DJ Hussey	13
DJM Short	4
DL Chahar	6
DPMD Jayawardene	10
DR Sams	0
DR Smith	28
DS Kulkarni	5
DT Christian	6
E Lewis	9
EJG Morgan	12
F du Plessis	58
G Gambhir	29
GJ Bailey	17
GJ Maxwell	44
Gurkeerat Singh	2
HM Amla	13
HV Patel	10
Harbhajan Singh	1
Harpreet Brar	9
IR Jaggi	0
Imran Tahir	5
Iqbal Abdulla	13
Ishan Kishan	8
JC Archer	19
JC Buttler	37
JDS Neesham	1

JJ Roy	39
JM Bairstow	6
JO Holder	1
JP Duminy	70
JP Faulkner	27
JR Philippe	5
K Gowtham	17
K Rabada	16
K Yadav	0
KA Jamieson	3
KB Arun Karthik	1
KD Karthik	54
KK Nair	7
KL Rahul	111
KM Jadhav	41
KP Pietersen	14
KS Bharat	6
KS Williamson	15
KW Richardson	1
Lalit Yadav	11
M Vijay	14
M Vohra	13
MA Agarwal	6
MA Wood	1
MC Henriques	11
MJ Guptill	9
MJ Santner	2
MK Pandey	61
MK Tiwary	30
MM Ali	10
MP Stoinis	14
MS Dhoni	56
Mandeep Singh	17
Mohammad Nabi	15

Mohammed Shami	1
N Jagadeesan	0
N Pooran	7
N Rana	16
NLTC Perera	8
NS Naik	2
NV Ojha	1
P Dubey	1
P Negi	27
PA Patel	12
PJ Cummins	35
PK Garg	0
PP Chawla	5
PP Shaw	7
PSP Handscomb	1
Q de Kock	2
R Ashwin	3
R Bhatia	9
R Dhawan	3
R Parag	3
R Tewatia	8
RA Jadeja	47
RA Tripathi	28
RD Gaikwad	21
RK Singh	6
RR Pant	47
RR Rossouw	2
RV Uthappa	52
Rashid Khan	3
S Dhawan	95
S Dube	10
S Gopal	8
S Kaul	0
S Nadeem	1

SA Yadav	27
SE Marsh	4
SK Raina	50
SM Curran	18
SN Khan	18
SN Thakur	2
SO Hetmyer	6
SP Narine	2
SPD Smith	68
SR Watson	25
SS Iyer	59
SS Tiwary	13
STR Binny	9
SV Samson	48

```python
bdf1 = pd.DataFrame(bumrah_df.groupby('striker')['runs_off_bat'].sum()).reset_index()


bdf1
```

	striker	runs_off_bat
0	A Mishra	1
1	AB de Villiers	125
2	AD Nath	4
3	AD Russell	51
4	AJ Finch	24
5	AJ Turner	0
6	AJ Tye	11
7	AK Markram	2
8	AM Rahane	43
9	AR Patel	21
10	AS Rajpoot	5
11	AT Carey	10
12	AT Rayudu	48
13	Abdul Samad	20
14	Abhishek Sharma	8
15	B Kumar	7
16	BA Stokes	27
17	BB McCullum	39
18	BCJ Cutting	5
19	BE Hendricks	0
20	BJ Hodge	12
21	Basil Thampi	1
22	C Munro	1
23	C Sakariya	1
24	C de Grandhomme	2
25	CA Ingram	3
26	CA Lynn	33
27	CA Pujara	4
28	CH Gayle	37
29	CH Morris	15
30	CJ Anderson	1
31	CJ Jordan	1
32	CR Woakes	6

32	CR Woakes	6
33	D Padikkal	8
34	D Wiese	8
35	DA Miller	27
36	DA Warner	54
37	DJ Bravo	34
38	DJ Hooda	23
39	DJ Hussey	13
40	DJM Short	4
41	DL Chahar	6
42	DPMD Jayawardene	10
43	DR Sams	0
44	DR Smith	28
45	DS Kulkarni	5
46	DT Christian	6
47	E Lewis	9
48	EJG Morgan	12
49	F du Plessis	58
50	G Gambhir	29
51	GJ Bailey	17
52	GJ Maxwell	44
53	Gurkeerat Singh	2
54	HM Amla	13
55	HV Patel	10
56	Harbhajan Singh	1
57	Harpreet Brar	9
58	IR Jaggi	0
59	Imran Tahir	5
60	Iqbal Abdulla	13
61	Ishan Kishan	8
62	JC Archer	19
63	JC Buttler	37
64	JDS Neesham	1
65	JJ Roy	39

66	JM Bairstow	6
67	JO Holder	1
68	JP Duminy	70
69	JP Faulkner	27
70	JR Philippe	5
71	K Gowtham	17
72	K Rabada	16
73	K Yadav	0
74	KA Jamieson	3
75	KB Arun Karthik	1
76	KD Karthik	54
77	KK Nair	7
78	KL Rahul	111
79	KM Jadhav	41
80	KP Pietersen	14
81	KS Bharat	6
82	KS Williamson	15
83	KW Richardson	1
84	Lalit Yadav	11
85	M Vijay	14
86	M Vohra	13
87	MA Agarwal	6
88	MA Wood	1
89	MC Henriques	11
90	MJ Guptill	9
91	MJ Santner	2
92	MK Pandey	61
93	MK Tiwary	30
94	MM Ali	10
95	MP Stoinis	14
96	MS Dhoni	56
97	Mandeep Singh	17
98	Mohammad Nabi	15
99	Mohammed Shami	1

100	N Jagadeesan	0
101	N Pooran	7
102	N Rana	16
103	NLTC Perera	8
104	NS Naik	2
105	NV Ojha	1
106	P Dubey	1
107	P Negi	27
108	PA Patel	12
109	PJ Cummins	35
110	PK Garg	0
111	PP Chawla	5
112	PP Shaw	7
113	PSP Handscomb	1
114	Q de Kock	2
115	R Ashwin	3
116	R Bhatia	9
117	R Dhawan	3
118	R Parag	3
119	R Tewatia	8
120	RA Jadeja	47
121	RA Tripathi	28
122	RD Gaikwad	21
123	RK Singh	6
124	RR Pant	47
125	RR Rossouw	2
126	RV Uthappa	52
127	Rashid Khan	3
128	S Dhawan	95
129	S Dube	10
130	S Gopal	8
131	S Kaul	0
132	S Nadeem	1
133	SA Yadav	27

134	SE Marsh	4
135	SK Raina	50
136	SM Curran	18
137	SN Khan	18
138	SN Thakur	2
139	SO Hetmyer	6
140	SP Narine	2
141	SPD Smith	68
142	SR Watson	25
143	SS Iyer	59
144	SS Tiwary	13
145	STR Binny	9
146	SV Samson	48
147	SW Billings	1
148	Sachin Baby	2
149	Sandeep Sharma	0
150	Shahbaz Ahmed	1
151	Shivam Sharma	1
152	Shubman Gill	24
153	TG Southee	1
154	TK Curran	1

```
bdf2 = pd.DataFrame(bumrah_df.groupby('striker')['ball'].count()).reset_index()
```

```
bdf2
```

	striker	ball
0	A Mishra	5
1	AB de Villiers	86
2	AD Nath	4
3	AD Russell	41
4	AJ Finch	29
5	AJ Turner	1
6	AJ Tye	7
7	AK Markram	2
8	AM Rahane	35
9	AR Patel	32
10	AS Rajpoot	6
11	AT Carey	6
12	AT Rayudu	34
13	Abdul Samad	10
14	Abhishek Sharma	11
15	B Kumar	8
16	BA Stokes	22
17	BB McCullum	23
18	BCJ Cutting	3
19	BE Hendricks	1
20	BJ Hodge	8
21	Basil Thampi	2
22	C Munro	3
23	C Sakariya	6
24	C de Grandhomme	11
25	CA Ingram	6
26	CA Lynn	27
27	CA Pujara	7
28	CH Gayle	53
29	CH Morris	14
30	CJ Anderson	1
31	CJ Jordan	2
32	CR Woakes	6