

ANNEXURE-1

Developed Python Script to Process Ball-By-Ball Data to Obtain Player-Vs-Player Data

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import pandas as pd
import numpy as np
df = pd.read_csv('/content/sample_data/ball_data.csv')
data_f = pd.DataFrame(columns = ['Match_id', 'Batsman','batting_team', 'Bowler','bowling_team',
'SR_bat_1_6', 'Total_runs_1_6', 'Avg_runs_1_6', 'Dot_balls_1_6', '1s_1_6', '2s_1_6', '4s_1_6',
'Avg_4s_1_6', '6s_1_6', 'Avg_6s_1_6', 'Balls_faced_1_6', 'SR_bat_7_15', 'Total_runs_7_15',
'Avg_runs_7_15', 'Dot_balls_7_15', '1s_7_15', '2s_7_15', '4s_7_15', 'Avg_4s_7_15', '6s_7_15',
'Avg_6s_7_15', 'Balls_faced_7_15', 'SR_bat_16_20', 'Total_runs_16_20', 'Avg_runs_16_20',
'Dot_balls_16_20', '1s_16_20', '2s_16_20', '4s_16_20', 'Avg_4s_16_20', '6s_16_20', 'Avg_6s_16_20',
'Balls_faced_16_20', '4s', 'Avg_4s', 'Time_to_4', '6s', 'Avg_6s', 'Time_to_6', 'Time_to_30',
'Time_to_50', 'Time_to_100', 'Balls_bowl_1_6', 'Dots_bowl_1_6', 'Avg_dots_bowl_1_6',
'Wides_1_6', 'No_balls_1_6', 'Bat_runs_conceded_1_6', 'Extra_runs_conceded_1_6',
'Total_runs_conceded_1_6', 'Wkts_taken_1_6', 'Bowled_1_6', 'Caught_1_6', 'SR_bowl_1_6',
'Economy_1_6', '4s_conceded_1_6', 'Avg_4s_conceded_1_6', '6s_conceded_1_6',
'Avg_6s_conceded_1_6', 'Balls_bowl_7_15', 'Dots_bowl_7_15', 'Avg_dots_bowl_7_15',
'Wides_7_15', 'No_balls_7_15', 'Bat_runs_conceded_7_15', 'Extra_runs_conceded_7_15',
'Total_runs_conceded_7_15', 'Wkts_taken_7_15', 'Bowled_7_15', 'Caught_7_15', 'SR_bowl_7_15',
'Economy_7_15', '4s_conceded_7_15', 'Avg_4s_conceded_7_15', '6s_conceded_7_15',
'Avg_6s_conceded_7_15', 'Balls_bowl_16_20', 'Dots_bowl_16_20', 'Avg_dots_bowl_16_20',
'Wides_16_20', 'No_balls_16_20', 'Bat_runs_conceded_16_20', 'Extra_runs_conceded_16_20',
'Total_runs_conceded_16_20', 'Wkts_taken_16_20', 'Bowled_16_20', 'Caught_16_20',
'SR_bowl_16_20', 'Economy_16_20', '4s_conceded_16_20', 'Avg_4s_conceded_16_20',
'6s_conceded_16_20', 'Avg_6s_conceded_16_20', '4s_conceded', 'Avg_4s_conceded', '6s_conceded',
'Avg_6s_conceded'])
ddf=pd.read_csv('/content/sample_data/2020.csv')
bat_arr = ddf['batsman'].unique()
bowl_arr = ddf['bowler'].unique()
p = np.concatenate((bat_arr, bowl_arr))
players_list = np.unique(p)
bat_arr
len(bat_arr)
bowl_arr
len(bowl_arr)
for bat in bat_arr:
    for bowl in bowl_arr:
        ## batsman stats
        df0 = df.loc[(df['batsman'] == bat) & (df['is_super_over'] == 0) & (df['bowler'] == bowl) ]
        if len(df0) == 0:
            continue
        df4 = df0.loc[(df0['wide_runs'] == 0)]
        list_1 = df4['match_id'].to_numpy()
        match_list = np.unique(list_1)
        #print(player)
        #print(len(match_list))

        ## 1 to 6

        df1 = df0.loc[(df0['over'] >= 1) & (df0['over'] <= 6)]
        BF_1_6 = len(df1) - df1.sum()[10]
        runs_1_6 = df1.sum()[15]
        if len(match_list) != 0:
            avg_runs_1_6 = (runs_1_6)/len(match_list)
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else:
    avg_runs_1_6 = 0
if BF_1_6 != 0:
    SR_bat_1_6 = (df1.sum()[15]/BF_1_6)*100
else:
    SR_bat_1_6 = float('nan')
try:
    dots_1_6 = df1.groupby('batsman_runs').size()[0]
except:
    dots_1_6 = 0
try:
    one_1_6 = df1.groupby('batsman_runs').size()[1]
except:
    one_1_6 = 0
try:
    two_1_6 = df1.groupby('batsman_runs').size()[2]
except:
    two_1_6 = 0
try:
    Fours_1_6 = df1.groupby('batsman_runs').size()[4]
    avg_4s_1_6 = Fours_1_6/len(match_list)
except:
    Fours_1_6 = 0
    avg_4s_1_6 = 0
try:
    Sixes_1_6 = df1.groupby('batsman_runs').size()[6]
    avg_6s_1_6 = Sixes_1_6/len(match_list)
except:
    Sixes_1_6 = 0
    avg_6s_1_6 = 0
try:
    wkts_1_6 = df1.loc[(df1['dismissal_kind'] != 'runout')].groupby('player_dismissed').size()[0]
except:
    wkts_1_6 = 0
# if wkts_1_6 != 0:
#     avg_bat_1_6 = df1.sum()[15]/wkts_1_6
# else:
#     avg_bat_1_6 = float('nan')

## 7 to 15

df2 = df0.loc[(df0['over'] >= 7) & (df0['over'] <= 15)]
BF_7_15 = len(df2) - df2.sum()[10]
runs_7_15 = df2.sum()[15]
if len(match_list) != 0:
    avg_runs_7_15 = (runs_7_15)/len(match_list)
else:
    avg_runs_7_15 = 0
if BF_7_15 != 0:
    SR_bat_7_15 = (df2.sum()[15]/BF_7_15)*100
else:
    SR_bat_7_15 = float('nan')
try:
    dots_7_15 = df2.groupby('batsman_runs').size()[0]
except:

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dots_7_15 = 0
try:
    one_7_15 = df2.groupby('batsman_runs').size()[1]
except:
    one_7_15 = 0
try:
    two_7_15 = df2.groupby('batsman_runs').size()[2]
except:
    two_7_15 = 0
try:
    Fours_7_15 = df2.groupby('batsman_runs').size()[4]
    avg_4s_7_15 = Fours_7_15/len(match_list)
except:
    Fours_7_15 = 0
    avg_4s_7_15 = 0
try:
    Sixes_7_15 = df2.groupby('batsman_runs').size()[6]
    avg_6s_7_15 = Sixes_7_15/len(match_list)
except:
    Sixes_7_15 = 0
    avg_6s_7_15 = 0
try:
    wkts_7_15 = df2.loc[(df2['dismissal_kind'] !=
'runout')].groupby('player_dismissed').size()[0]
except:
    wkts_7_15 = 0
# if wkts_7_15 != 0:
#     avg_bat_7_15 = df2.sum()[15]/wkts_16_20
# else:
#     avg_bat_7_15 = float('nan')

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16 to 20

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df3 = df0.loc[(df0['over'] >= 16) & (df0['over'] <= 20)]
BF_16_20 = len(df3) - df3.sum()[10]
runs_16_20 = df3.sum()[15]
if len(match_list):
    avg_runs_16_20 = (runs_16_20)/len(match_list)
else:
    avg_runs_16_20 = 0
if BF_16_20 != 0:
    SR_bat_16_20 = (df3.sum()[15]/BF_16_20)*100
else:
    SR_bat_16_20 = float('nan')
try:
    dots_16_20 = df3.groupby('batsman_runs').size()[0]
except:
    dots_16_20 = 0
try:
    one_16_20 = df3.groupby('batsman_runs').size()[1]
except:
    one_16_20 = 0
try:
    two_16_20 = df3.groupby('batsman_runs').size()[2]

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except:
    two_16_20 = 0
try:
    Fours_16_20 = df3.groupby('batsman_runs').size()[4]
    avg_4s_16_20 = Fours_16_20/len(match_list)
except:
    Fours_16_20 = 0
    avg_4s_16_20 = 0
try:
    Sixes_16_20 = df3.groupby('batsman_runs').size()[6]
    avg_6s_16_20 = Sixes_16_20/len(match_list)
except:
    Sixes_16_20 = 0
    avg_6s_16_20 = 0
try:
    wkts_16_20 = df3.loc[(df3['dismissal_kind'] != 'run
out').groupby('player_dismissed').size()[0]
except:
    wkts_16_20 = 0
# if wkts_16_20 != 0:
#     avg_bat_16_20 = df3.sum()[15]/wkts_16_20
# else:
#     avg_bat_16_20 = float('nan')

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General stats

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try:
    Fours = df0.groupby('batsman_runs').size()[4]
    avg_4s = Fours/len(match_list)
except:
    Fours = 0
    avg_4s = 0
try:
    Sixes = df0.groupby('batsman_runs').size()[6]
    avg_6s = Sixes/len(match_list)
except:
    Sixes = 0
    avg_6s = 0
balls_list_30 = []
balls_list_50 = []
balls_list_100 = []
a_4 = []
a_6 = []
for match in match_list:
    df5 = df4.loc[(df4['match_id'] == match)]
    runs_list = df5['batsman_runs'].tolist()
    t1 = 0
    t2 = 0
    for i in runs_list:
        if i != 4:
            t1 = t1 + 1
        else:
            a_4.append(t1)
            t1 = 0
    for j in runs_list:

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    if j != 6:
        t2 = t2 + 1
    else:
        a_6.append(t2)
        t2 = 0
runs = 0
balls = 0
for k in runs_list:
    runs = runs + k
    balls = balls + 1
    if runs >= 30:
        balls_list_30.append(balls)
        break
runs = 0
balls = 0
for l in runs_list:
    runs = runs + 1
    balls = balls + 1
    if runs >= 50:
        balls_list_50.append(balls)
        break
runs = 0
balls = 0
for m in runs_list:
    runs = runs + m
    balls = balls + 1
    if runs >= 100:
        balls_list_100.append(balls)
        break
if len(balls_list_30) != 0:
    time_to_30s = sum(balls_list_30)/len(balls_list_30)
if len(balls_list_30) == 0:
    time_to_30s = float('nan')
if len(balls_list_50) != 0:
    time_to_50s = sum(balls_list_50)/len(balls_list_50)
if len(balls_list_50) == 0:
    time_to_50s = float('nan')
if len(balls_list_100) != 0:
    time_to_100s = sum(balls_list_100)/len(balls_list_100)
if len(balls_list_100) == 0:
    time_to_100s = float('nan')
if len(a_4) != 0:
    time_to_4s = sum(a_4)/len(a_4)
if len(a_4) == 0:
    time_to_4s = float('nan')
if len(a_6) != 0:
    time_to_6s = sum(a_6)/len(a_6)
if len(a_6) == 0:
    time_to_6s = float('nan')

## bowler stats

d0 = df.loc[(df['bowler'] == bow1) & (df['is_super_over'] == 0) & (df['batsman'] == bat)]
d10 = d0.loc[(d0['wide_runs'] == 0)]
list_2 = d10['match_id'].to_numpy()

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match_list = np.unique(list_2)

## 1 to 6

d1 = d0.loc[(d0['over'] >= 1) & (d0['over'] <= 6)]
d2 = d1.loc[d1['dismissal_kind'] != 'run out']
d3 = d1.loc[(d1['wide_runs'] == 0) & (d1['noball_runs'] == 0)]
balls_1_6 = len(d3)
wides_1_6 = d1.sum()[10]
no_balls_1_6 = d1.sum()[13]
bat_runs_conceded_1_6 = d1.sum()[15]
extra_runs_conceded_1_6 = wides_1_6 + no_balls_1_6
total_runs_conceded_1_6 = d1.sum()[17]
wkts_taken_1_6 = d2['player_dismissed'].count()
try:
    dots_bowl_1_6 = d1.groupby('total_runs').size()[0]
except:
    dots_bowl_1_6 = 0
try:
    avg_dots_bowl_1_6 = d1.groupby('total_runs').size()[0]/len(match_list)
except:
    avg_dots_bowl_1_6 = 0
try:
    bowled_1_6 = d2[d2.player_dismissed.notnull()].groupby('dismissal_kind').size()['bowled']
except:
    bowled_1_6 = 0
try:
    caught_1_6 = d2[d2.player_dismissed.notnull()].groupby('dismissal_kind').size()['caught']
except:
    caught_1_6 = 0
if wkts_taken_1_6 != 0:
    avg_bowl_1_6 = total_runs_conceded_1_6/wkts_taken_1_6
else:
    avg_bowl_1_6 = float('nan')
if wkts_taken_1_6 != 0:
    SR_bowl_1_6 = balls_1_6/wkts_taken_1_6
else:
    SR_bowl_1_6 = float('nan')
if balls_1_6 != 0:
    economy_1_6 = (total_runs_conceded_1_6/balls_1_6)*6
else:
    economy_1_6 = float('nan')
try:
    Fours_conceded_1_6 = d1.groupby('batsman_runs').size()[4]
    avg_4s_conceded_1_6 = Fours_conceded_1_6/len(match_list)
except:
    Fours_conceded_1_6 = 0
    avg_4s_conceded_1_6 = 0
try:
    Sixes_conceded_1_6 = d1.groupby('batsman_runs').size()[6]
    avg_6s_conceded_1_6 = Sixes_conceded_1_6/len(match_list)
except:
    Sixes_conceded_1_6 = 0
    avg_6s_conceded_1_6 = 0

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## 7 to 15

d4 = d0.loc[(d0['over'] >= 7) & (d0['over'] <= 15)]
d5 = d4.loc[d4['dismissal_kind'] != 'run out']
d6 = d4.loc[(d4['wide_runs'] == 0) & (d4['noball_runs'] == 0)]
balls_7_15 = len(d6)
wides_7_15 = d4.sum()[10]
no_balls_7_15 = d4.sum()[13]
bat_runs_conceded_7_15 = d4.sum()[15]
extra_runs_conceded_7_15 = d4.sum()[16]
total_runs_conceded_7_15 = d4.sum()[17]
wkts_taken_7_15 = d5['player_dismissed'].count()
try:
    dots_bowl_7_15 = d4.groupby('total_runs').size()[0]
except:
    dots_bowl_7_15 = 0
try:
    avg_dots_bowl_7_15 = d4.groupby('total_runs').size()[0]/len(match_list)
except:
    avg_dots_bowl_7_15 = 0
try:
    bowled_7_15 =
d5[d5.player_dismissed.notnull()].groupby('dismissal_kind').size()['bowled']
except:
    bowled_7_15 = 0
try:
    caught_7_15 = d5[d5.player_dismissed.notnull()].groupby('dismissal_kind').size()['caught']
except:
    caught_7_15 = 0
if wkts_taken_7_15 != 0:
    avg_bowl_7_15 = total_runs_conceded_7_15/wkts_taken_7_15
else:
    avg_bowl_7_15 = float('nan')
if wkts_taken_7_15 != 0:
    SR_bowl_7_15 = balls_7_15/wkts_taken_7_15
else:
    SR_bowl_7_15 = float('nan')
if balls_7_15 != 0:
    economy_7_15 = (total_runs_conceded_7_15/balls_7_15)*6
else:
    economy_7_15 = float('nan')
try:
    Fours_conceded_7_15 = d4.groupby('batsman_runs').size()[4]
    avg_4s_conceded_7_15 = Fours_conceded_7_15/len(match_list)
except:
    Fours_conceded_7_15 = 0
    avg_4s_conceded_7_15 = 0
try:
    Sixes_conceded_7_15 = d4.groupby('batsman_runs').size()[6]
    avg_6s_conceded_7_15 = Sixes_conceded_7_15/len(match_list)
except:
    Sixes_conceded_7_15 = 0
    avg_6s_conceded_7_15 = 0

## 16 to 20

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d7 = d0.loc[(d0['over'] >= 16) & (d0['over'] <= 20)]
d8 = d7.loc[d7['dismissal_kind'] != 'run out']
d9 = d7.loc[(d7['wide_runs'] == 0) & (d7['noball_runs'] == 0)]
balls_16_20 = len(d9)
wides_16_20 = d7.sum()[10]
no_balls_16_20 = d7.sum()[13]
bat_runs_conceded_16_20 = d7.sum()[15]
extra_runs_conceded_16_20 = d7.sum()[16]
total_runs_conceded_16_20 = d7.sum()[17]
wkts_taken_16_20 = d8['player_dismissed'].count()
try:
    dots_bowl_16_20 = d7.groupby('total_runs').size()[0]
except:
    dots_bowl_16_20 = 0
try:
    avg_dots_bowl_16_20 = d7.groupby('total_runs').size()[0]/len(match_list)
except:
    avg_dots_bowl_16_20 = 0
try:
    bowled_16_20 =
d8[d8.player_dismissed.notnull()].groupby('dismissal_kind').size()['bowled']
except:
    bowled_16_20 = 0
try:
    caught_16_20 =
d8[d8.player_dismissed.notnull()].groupby('dismissal_kind').size()['caught']
except:
    caught_16_20 = 0
if wkts_taken_16_20 != 0:
    avg_bowl_16_20 = total_runs_conceded_16_20/wkts_taken_16_20
else:
    avg_bowl_16_20 = float('nan')
if wkts_taken_16_20 != 0:
    SR_bowl_16_20 = balls_16_20/wkts_taken_16_20
else:
    SR_bowl_16_20 = float('nan')
if balls_16_20 != 0:
    economy_16_20 = (total_runs_conceded_16_20/balls_16_20)*6
else:
    economy_16_20 = float('nan')
try:
    Fours_conceded_16_20 = d7.groupby('batsman_runs').size()[4]
    avg_4s_conceded_16_20 = Fours_conceded_16_20/len(match_list)
except:
    Fours_conceded_16_20 = 0
    avg_4s_conceded_16_20 = 0
try:
    Sixes_conceded_16_20 = d7.groupby('batsman_runs').size()[6]
    avg_6s_conceded_16_20 = Sixes_conceded_16_20/len(match_list)
except:
    Sixes_conceded_16_20 = 0
    avg_6s_conceded_16_20 = 0

## General stats

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try:
    Fours_conceded = d0.groupby('batsman_runs').size()[4]
    avg_4s_conceded = Fours_conceded/len(match_list)
except:
    Fours_conceded = 0
    avg_4s_conceded = 0
try:
    Sixes_conceded = d0.groupby('batsman_runs').size()[6]
    avg_6s_conceded = Sixes_conceded/len(match_list)
except:
    Sixes_conceded = 0
    avg_6s_conceded = 0
batting_team= df0['batting_team'].unique()[0]
bowling_team= df0['bowling_team'].unique()[0]
data_f = data_f.append({'Match_id' : match, 'Batsman' : bat,'batting_team': batting_team ,
'Bowler' : bowl,'bowling_team':bowling_team , 'SR_bat_1_6' : SR_bat_1_6, 'Total_runs_1_6' :
runs_1_6, 'Avg_runs_1_6' : avg_runs_1_6, 'Dot_balls_1_6' : dots_1_6, '1s_1_6' : one_1_6, '2s_1_6' :
two_1_6, '4s_1_6' : Fours_1_6, 'Avg_4s_1_6' : avg_4s_1_6, '6s_1_6' : Sixes_1_6, 'Avg_6s_1_6' :
avg_6s_1_6, 'Balls_faced_1_6' : BF_1_6, 'SR_bat_7_15' : SR_bat_7_15, 'Total_runs_7_15' :
runs_7_15, 'Avg_runs_7_15' : avg_runs_7_15, 'Dot_balls_7_15' : dots_7_15, '1s_7_15' : one_7_15,
'2s_7_15' : two_7_15, '4s_7_15' : Fours_7_15, 'Avg_4s_7_15' : avg_4s_7_15, '6s_7_15' : Sixes_7_15,
'Avg_6s_7_15' : avg_6s_7_15, 'Balls_faced_7_15' : BF_7_15, 'SR_bat_16_20' : SR_bat_16_20,
'Total_runs_16_20' : runs_16_20, 'Avg_runs_16_20' : avg_runs_16_20, 'Dot_balls_16_20' :
dots_16_20, '1s_16_20' : one_16_20, '2s_16_20' : two_16_20, '4s_16_20' : Fours_16_20,
'Avg_4s_16_20' : avg_4s_16_20, '6s_16_20' : Sixes_16_20, 'Avg_6s_16_20' : avg_6s_16_20,
'Balls_faced_16_20' : BF_16_20, '4s' : Fours, 'Avg_4s' : avg_4s, 'Time_to_4' : time_to_4s, '6s' : Sixes,
'Avg_6s' : avg_6s, 'Time_to_6' : time_to_6s, 'Time_to_30' : time_to_30s, 'Time_to_50' : time_to_50s,
'Time_to_100' : time_to_100s, 'Balls_bowl_1_6' : balls_1_6, 'Dots_bowl_1_6' : dots_bowl_1_6,
'Avg_dots_bowl_1_6' : avg_dots_bowl_1_6, 'Wides_1_6' : wides_1_6, 'No_balls_1_6' :
no_balls_1_6, 'Bat_runs_conceded_1_6' : bat_runs_conceded_1_6, 'Extra_runs_conceded_1_6' :
extra_runs_conceded_1_6, 'Total_runs_conceded_1_6' : total_runs_conceded_1_6, 'Wkts_taken_1_6'
: wkts_taken_1_6, 'Bowled_1_6' : bowled_1_6, 'Caught_1_6' : caught_1_6, 'SR_bowl_1_6' :
SR_bowl_1_6, 'Economy_1_6' : economy_1_6, '4s_conceded_1_6' : Fours_conceded_1_6,
'Avg_4s_conceded_1_6' : avg_4s_conceded_1_6, '6s_conceded_1_6' : Sixes_conceded_1_6,
'Avg_6s_conceded_1_6' : avg_6s_conceded_1_6, 'Balls_bowl_7_15' : balls_7_15, 'Dots_bowl_7_15' :
dots_bowl_7_15, 'Avg_dots_bowl_7_15' : avg_dots_bowl_7_15, 'Wides_7_15' : wides_7_15,
'No_balls_7_15' : no_balls_7_15, 'Bat_runs_conceded_7_15' : bat_runs_conceded_7_15,
'Extra_runs_conceded_7_15' : extra_runs_conceded_7_15, 'Total_runs_conceded_7_15' :
total_runs_conceded_7_15, 'Wkts_taken_7_15' : wkts_taken_7_15, 'Bowled_7_15' : bowled_7_15,
'Caught_7_15' : caught_7_15, 'SR_bowl_7_15' : SR_bowl_7_15, 'Economy_7_15' : economy_7_15,
'4s_conceded_7_15' : Fours_conceded_7_15, 'Avg_4s_conceded_7_15' : avg_4s_conceded_7_15,
'6s_conceded_7_15' : Sixes_conceded_7_15, 'Avg_6s_conceded_7_15' : avg_6s_conceded_7_15,
'Balls_bowl_16_20' : balls_16_20, 'Dots_bowl_16_20' : dots_bowl_16_20, 'Avg_dots_bowl_16_20' :
avg_dots_bowl_16_20, 'Wides_16_20' : wides_16_20, 'No_balls_16_20' : no_balls_16_20,
'Bat_runs_conceded_16_20' : bat_runs_conceded_16_20, 'Extra_runs_conceded_16_20' :
extra_runs_conceded_16_20, 'Total_runs_conceded_16_20' : total_runs_conceded_16_20,
'Wkts_taken_16_20' : wkts_taken_16_20, 'Bowled_16_20' : bowled_16_20, 'Caught_16_20' :
caught_16_20, 'SR_bowl_16_20' : SR_bowl_16_20, 'Economy_16_20' : economy_16_20,
'4s_conceded_16_20' : Fours_conceded_16_20, 'Avg_4s_conceded_16_20' :
avg_4s_conceded_16_20, '6s_conceded_16_20' : Sixes_conceded_16_20, 'Avg_6s_conceded_16_20'
: avg_6s_conceded_16_20, '4s_conceded' : Fours_conceded, 'Avg_4s_conceded' : avg_4s_conceded,
'6s_conceded' : Sixes_conceded, 'Avg_6s_conceded' : avg_6s_conceded}, ignore_index = True)
data_f.to_csv('final_RCB.csv')

```

```

data_m = pd.read_csv('/content/sample_data/final_RCB.csv')
data_m['Bat_Ratings_1_6']=(1*((data_m['SR_bat_1_6']*0.15)+(data_m['Total_runs_1_6']*0.30)+(data_m['Avg_runs_1_6']*0.15)+(data_m['Dot_balls_1_6']*(-0.1)))+(data_m['1s_1_6']*0.03)+(data_m['2s_1_6']*0.07)+(data_m['Avg_4s_1_6']*0.15)+(data_m['Avg_6s_1_6']*0.22)+(data_m['Balls_faced_1_6']*0.03)))
data_m['Bat_Ratings_7_15']=(1*((data_m['SR_bat_7_15']*0.20)+(data_m['Total_runs_7_15']*0.35)+(data_m['Avg_runs_7_15']*0.15)+(data_m['Dot_balls_7_15']*(-0.2)))+(data_m['1s_7_15']*0.04)+(data_m['2s_7_15']*0.08)+(data_m['Avg_4s_7_15']*0.16)+(data_m['Avg_6s_7_15']*0.20)+(data_m['Balls_faced_7_15']*0.02)))
data_m['Bat_Ratings_16_20']=(1*((data_m['SR_bat_16_20']*0.25)+(data_m['Total_runs_16_20']*0.30)+(data_m['Avg_runs_16_20']*0.10)+(data_m['Dot_balls_16_20']*(-0.3)))+(data_m['1s_16_20']*0.02)+(data_m['2s_16_20']*0.05)+(data_m['Avg_4s_16_20']*0.25)+(data_m['Avg_6s_16_20']*0.30)+(data_m['Balls_faced_16_20']*0.03)))
data_m['Ratings_Bat_Total']=
data_m.loc[:,['Bat_Ratings_1_6','Bat_Ratings_7_15','Bat_Ratings_16_20']].sum(axis=1)
data_m['Bowl_Ratings_16_20']=(1*((data_m['Balls_faced_16_20']*0.40)+(data_m['Wkts_taken_16_20']*0.80)+(data_m['Dot_balls_16_20']*0.80)+(data_m['Total_runs_16_20']*(-0.30)))+(data_m['Avg_4s_16_20']*(-0.15)))+(data_m['Avg_6s_16_20']*(-0.30)))

data_m['Bowl_Ratings_7_15']=(1*((data_m['Balls_faced_7_15']*0.35)+(data_m['Wkts_taken_7_15']*0.70)+(data_m['Dot_balls_7_15']*0.70)+(data_m['Total_runs_7_15']*(-0.25)))+(data_m['Avg_4s_7_15']*(-0.15)))+(data_m['Avg_6s_7_15']*(-0.25)))
data_m['Bowl_Ratings_1_6']=(1*((data_m['Balls_faced_1_6']*0.25)+(data_m['Wkts_taken_1_6']*0.60)+(data_m['Dot_balls_1_6']*0.50)+(data_m['Total_runs_1_6']*(-0.10)))+(data_m['Avg_4s_1_6']*(-0.10)))+(data_m['Avg_6s_1_6']*(-0.15)))
data_m['Ratings_Bowl_Total']=
data_m.loc[:,['Bowl_Ratings_1_6','Bowl_Ratings_7_15','Bowl_Ratings_16_20']].sum(axis=1)
data_m[['Batsman', 'Bowler','Ratings_Bat_Total','Ratings_Bowl_Total']]
data_gg = data_m[['Batsman', 'Bowler','Ratings_Bat_Total','Ratings_Bowl_Total']]
data_gg
def load_data():
    df_2020 = pd.read_csv('/content/sample_data/2020.csv')
    return df_2020.loc[:, ['batsman','batting_team']].dropna()
df_2020_bat = load_data()
def load_data():
    df_2020 = pd.read_csv('/content/sample_data/2020.csv')
    return df_2020.loc[:, ['bowler','bowling_team']].dropna()
df_2020_bowl = load_data()
df_2020_bat = df_2020_bat.drop_duplicates(subset='batsman', keep='first')
df_2020_bat
df_2020_bowl = df_2020_bowl.drop_duplicates(subset='bowler', keep='first')
df_2020_bowl
df_2020_bat.rename(columns={'batsman': 'Batsman'}, inplace=True)
df_2020_bowl.rename(columns={'bowler': 'Bowler'}, inplace=True)
df_2020_bowl
team_allot = pd.merge(data_gg, df_2020_bat, how='left', on=['Batsman'])
team_allotment = pd.merge(team_allot, df_2020_bowl, how='left', on=['Bowler'])
team_arr = team_allotment['batting_team'].unique()

Team_bowl = team_allotment.loc[(team_allotment['bowling_team']=='KKR') &
(team_allotment['batting_team']=='RR') ]
## Select the team you'd wish to find best playing-11 for, in bowling team and opposition in batting team
Team_bat = team_allotment.loc[(team_allotment['bowling_team']=='RR') &
(team_allotment['batting_team']=='KKR') ]

```

```

## Select the team you'd wish to find best playing-11 for, in batting team and opposition in bowling
team
import statistics
bowl=(Team_bowl.groupby('Bowler', as_index=False).Ratings_Bowl_Total.sum())
bat=(Team_bat.groupby('Batsman', as_index=False).Ratings_Bat_Total.sum())
bat.rename(columns={'Batsman': 'Player'}, inplace=True)
bowl.rename(columns={'Bowler': 'Player'}, inplace=True)
total_team = bat.merge(bowl, how = 'outer' ,indicator=False)
total_team['Ratings_All_Total']=total_team.loc[:,['Ratings_Bat_Total','Ratings_Bowl_Total']].sum(ax
is=1)
total_team.sort_values(by=['Ratings_All_Total'],inplace=True, ascending=False)
Overall_team=(total_team.groupby('Player', as_index=False).Ratings_All_Total.sum())
Overall_team.rename(columns={'Ratings_All_Total': 'RR'}, inplace=True)
Overall_team.to_csv('KKR_vs_RR.csv')
df1 = pd.read_csv('/content/sample_data/KKR_vs_CSK.csv')
df2 = pd.read_csv('/content/sample_data/KKR_vs_DC.csv')
df3 = pd.read_csv('/content/sample_data/KKR_vs_KXIP.csv')
df4 = pd.read_csv('/content/sample_data/KKR_vs_MI.csv')
df5 = pd.read_csv('/content/sample_data/KKR_vs_RCB.csv')
df6 = pd.read_csv('/content/sample_data/KKR_vs_RR.csv')
df7 = pd.read_csv('/content/sample_data/KKR_vs_SRH.csv')
df1.set_index('Player', inplace=True)
df2.set_index('Player', inplace=True)
df3.set_index('Player', inplace=True)
df4.set_index('Player', inplace=True)
df5.set_index('Player', inplace=True)
df6.set_index('Player', inplace=True)
df7.set_index('Player', inplace=True)
Xij = pd.concat([df1, df2, df3,df4, df5,df6, df7], axis=1)
pd.options.display.float_format = '{:,.0f}'.format
Xij.drop(Xij.filter(regex="Unnamed: 0"),axis=1, inplace=True)
Xij=Xij.replace(np.nan,0)
Xij.to_csv('KKR_Xij.csv')

```

ANNEXURE-2

Developed LINGO Set Code to Generate Proposed Optimization Model

MODEL:

Title TEAM SELECTION;

SETS:

I/1..i/:B, O, A, W, F;

J/1..j/: ;

IJ(I,J): R, X;

ENDSETS

[OBJECTIVE] MAX = @SUM(IJ(p,q): R(p,q)*X(p,q));

!Minimum Number of batsman;

@FOR(J(q): @SUM(I(p): X(p,q)*B(p))>= NBj);

!Minimum Number of bowlers;

@FOR(J(q): @SUM(I(p): X(p,q)*O(p))>= NOj);

!Minimum Number of All-Rounders;

@FOR(J(q): @SUM(I(p): X(p,q)*A(p))>= NAj);

!Minimum Number of Wicket-keepers;

@FOR(J(q): @SUM(I(p): X(p,q)*W(p))>= NWj);

!Maximum number of foreign Players permitted in the playing-11;

@FOR(J(q): @SUM(I(p): X(p,q)*F(p))>= MFj);

!Required Team Size;

@FOR(J(q): @SUM(I(p): X(p,q))= 11);

!Binary Decision Variables;

@FOR(IJ(p,q): @BIN(X(p,q)));

ANNEXURE-3

Solution Report Containing The Playing-11 For Each Franchise Against Each Opponent

Exhibit-1: Suggested Playing-11 from Chennai Super Kings (CSK) Squad along with Rating Against Different Opposition Franchise

CSK XI	Playing-11 For CSK Against Different Opposition Franchise													
	DC		KKR		PBKS		MI		RCB		RR		SRH	
	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings
1	AT Rayudu	861.37	AT Rayudu	465.11	AT Rayudu	475.62	AT Rayudu	578.41	AT Rayudu	742.81	AT Rayudu	538.27	AT Rayudu	596.83
2	DJ Bravo	149.11	DJ Bravo	108.21	DJ Bravo	406.67	DJ Bravo	561.63	DJ Bravo	259.67	DJ Bravo	349.01	DJ Bravo	180.01
3	DL Chahar	232.74	DL Chahar	91.84	DL Chahar	36.70	F du Plessis	542.73	DL Chahar	65.15	F du Plessis	567.61	DL Chahar	115.30
4	F du Plessis	569.78	Imran Tahir	30.58	F du Plessis	593.02	Imran Tahir	182.58	KM Jadhav	227.24	KM Jadhav	379.43	F du Plessis	483.46
5	Imran Tahir	84.60	KM Jadhav	156.47	Imran Tahir	34.39	KM Jadhav	240.85	M Vijay	275.51	KV Sharma	28.06	KM Jadhav	216.79
6	KM Jadhav	294.36	KV Sharma	26.68	MS Dhoni	384.94	M Vijay	219.08	MS Dhoni	597.66	MS Dhoni	719.70	MS Dhoni	618.70
7	M Vijay	196.05	MS Dhoni	324.21	PP Chawla	29.23	MS Dhoni	571.90	PP Chawla	52.74	PP Chawla	49.25	PP Chawla	49.50
8	MS Dhoni	464.82	RA Jadeja	443.03	RA Jadeja	233.20	PP Chawla	70.83	RA Jadeja	412.25	RA Jadeja	532.86	RA Jadeja	605.45
9	PP Chawla	47.55	RD Gaikwad	381.91	RD Gaikwad	390.41	RA Jadeja	547.97	RD Gaikwad	356.82	S Curran	189.65	S Curran	322.05
10	RA Jadeja	586.42	S Curran	263.63	SN Thakur	12.15	SN Thakur	234.59	SN Thakur	40.85	SN Thakur	30.21	SN Thakur	107.80
11	SR Watson	393.22	SR Watson	411.02	SR Watson	536.02	SR Watson	427.79	SR Watson	310.62	SR Watson	588.55	SR Watson	851.49

Exhibit-2: Suggested Playing-11 from Delhi Capitals (DC) Squad along with Rating Against Different Opposition Franchise

DC XI	Playing-11 For DC Against Different Opposition Franchise													
	CSK		KKR		PBKS		MI		RCB		RR		SRH	
	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings
1	A Mishra	117.88	A Mishra	27.79	A Mishra	33.23	A Mishra	77.40	A Mishra	31.31	A Mishra	75.32	AM Rahane	605.88
2	AM Rahane	582.56	AM Rahane	204.58	AM Rahane	370.53	AM Rahane	515.68	AM Rahane	691.81	AR Patel	358.13	AR Patel	298.99
3	AR Patel	420.92	AR Patel	284.07	AR Patel	229.70	AR Patel	340.58	AR Patel	559.79	Anrich Nortje	20.53	Anrich Nortje	67.82
4	Ankit Sharma	25.93	Deshpande	29.88	HV Patel	24.74	HV Patel	268.51	HV Patel	3.95	K Rabada	45.89	Deshpande	155.32
5	K Rabada	20.39	HV Patel	169.58	K Rabada	42.73	K Rabada	342.64	K Rabada	27.41	MP Stoinis	481.58	K Rabada	191.16
6	MP Stoinis	378.77	K Rabada	57.19	MP Stoinis	320.34	MP Stoinis	517.65	MP Stoinis	412.06	P Shaw	286.14	MP Stoinis	295.51
7	P Shaw	250.64	P Shaw	628.23	P Shaw	144.00	P Shaw	152.56	P Shaw	212.22	R Ashwin	70.67	R Ashwin	211.69
8	R Ashwin	220.37	R Ashwin	250.10	R Ashwin	174.34	R Ashwin	368.81	R Ashwin	287.36	RR Pant	765.42	RR Pant	846.58
9	RR Pant	637.22	RR Pant	532.98	RR Pant	333.25	RR Pant	618.77	RR Pant	808.37	S Dhawan	441.75	S Dhawan	730.77
10	S Dhawan	718.43	S Dhawan	576.51	S Dhawan	678.76	S Dhawan	720.13	S Dhawan	624.37	SS Iyer	445.03	SS Iyer	474.86
11	SS Iyer	590.47	SS Iyer	829.60	SS Iyer	403.27	SS Iyer	778.04	SS Iyer	517.48	S Hetmyer	292.37	S Hetmyer	627.19

Exhibit-3: Suggested Playing-11 from Kolkata Knight Riders (KKR) Squad along with Rating Against Different Opposition Franchise

KKR XI	Playing-11 For KKR Against Different Opposition Franchise													
	CSK		DC		PBKS		MI		RCB		RR		SRH	
	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings
1	CV Varun	18.83	AD Russell	738.51	AD Russell	493.42	AD Russell	405.49	AD Russell	598.24	AD Russell	839.20	AD Russell	329.11
2	EJG Morgan	361.25	EJG Morgan	430.67	CV Varun	44.32	CV Varun	10.10	CV Varun	74.67	CV Varun	13.73	CV Varun	11.03
3	KD Karthik	703.11	KD Karthik	508.09	EJG Morgan	265.93	EJG Morgan	381.21	EJG Morgan	493.12	EJG Morgan	395.03	EJG Morgan	566.13
4	Kuldeep Yadav	18.86	KL Nagarkoti	54.84	KD Karthik	599.76	KD Karthik	586.55	KD Karthik	467.17	KD Karthik	651.72	KD Karthik	573.07
5	L Ferguson	7.20	Kuldeep Yadav	123.06	KL Nagarkoti	18.52	Kuldeep Yadav	93.02	Kuldeep Yadav	92.47	KL Nagarkoti	112.13	KL Nagarkoti	2.15
6	N Rana	518.94	N Rana	659.05	Kuldeep Yadav	59.98	N Rana	518.42	L Ferguson	140.42	Kuldeep Yadav	29.22	Kuldeep Yadav	36.99
7	PJ Cummins	185.43	PJ Cummins	100.35	L Ferguson	191.39	PJ Cummins	335.11	N Rana	707.95	N Rana	413.86	N Rana	413.50
8	R Singh	115.40	RA Tripathi	346.54	N Rana	275.01	RA Tripathi	119.13	PJ Cummins	70.76	PJ Cummins	209.71	PJ Cummins	124.03
9	RA Tripathi	560.43	SP Narine	507.63	PJ Cummins	89.07	SP Narine	255.34	R Singh	21.12	RA Tripathi	343.99	RA Tripathi	258.28
10	SP Narine	506.86	Shivam Mavi	4.44	RA Tripathi	178.38	Shivam Mavi	149.96	RA Tripathi	577.77	SP Narine	320.57	SP Narine	346.45
11	Shubman Gill	103.52	Shubman Gill	166.27	Shubman Gill	301.02	Shubman Gill	121.86	Shubman Gill	140.48	Shivam Mavi	21.55	Shubman Gill	320.27

Exhibit-4: Suggested Playing-11 from Punjab Kings (PBKS) Squad along with Rating Against Different Opposition Franchise

PBKS XI	Playing-11 For PBKS Against Different Opposition Franchise													
	CSK		DC		KKR		MI		RCB		RR		SRH	
	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s
1	CH Gayle	516.59	CH Gayle	407.35	CH Gayle	586.56	CH Gayle	573.76	CH Gayle	590.32	CH Gayle	813.41	CH Gayle	763.05
2	CJ Jordan	41.09	CJ Jordan	58.60	CJ Jordan	23.90	CJ Jordan	127.23	CJ Jordan	9.45	DJ Hooda	275.41	DJ Hooda	104.51
3	DJ Hooda	487.76	DJ Hooda	312.29	DJ Hooda	146.76	DJ Hooda	316.62	DJ Hooda	243.39	GJ Maxwell	403.50	GJ Maxwell	295.03
4	GJ Maxwell	448.21	GJ Maxwell	494.93	GJ Maxwell	337.14	GJ Maxwell	415.60	GJ Maxwell	253.53	K Gowtham	51.27	KK Nair	414.80
5	KK Nair	431.70	K Gowtham	176.47	KL Rahul	610.05	JDS Neesham	74.69	KK Nair	522.64	KK Nair	298.83	KL Rahul	675.85
6	KL Rahul	491.15	KK Nair	674.06	M Ashwin	14.70	K Gowtham	269.21	KL Rahul	823.35	KL Rahul	744.67	M Ashwin	101.88
7	M Ashwin	53.09	KL Rahul	476.06	MA Agarwal	403.36	KK Nair	327.84	M Ashwin	66.60	M Ur Rahman	22.45	M Ur Rahman	171.60
8	Mandeep Singh	440.63	MA Agarwal	657.52	Mandeep Singh	523.00	KL Rahul	766.05	Mohammed Shami	25.75	MA Agarwal	604.33	MA Agarwal	385.43
9	Mohammed Shami	76.19	Mandeep Singh	417.95	Mohammed Shami	67.15	MA Agarwal	291.14	N Pooran	425.48	Mohammed Shami	39.11	Mohammed Shami	77.45
10	N Pooran	361.95	Mohammed Shami	242.64	N Pooran	256.40	Mandeep Singh	299.19	Ravi Bishnoi	14.30	N Pooran	372.15	N Pooran	549.21
11	Ravi Bishnoi	11.45	Ravi Bishnoi	14.33	Ravi Bishnoi	17.55	Mohammed Shami	84.87	Arshdeep Singh	2.05	Ravi Bishnoi	17.80	Ravi Bishnoi	83.16

Exhibit-5: Suggested Playing-11 from Mumbai Indians (MI) Squad along with Rating Against Different Opposition Franchise

MI XI	Playing-11 For MI Against Different Opposition Franchise													
	CSK		DC		KKR		PBKS		RCB		RR		SRH	
	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s
1	DS Kulkarni	88.49	DS Kulkarni	138.60	HH Pandya	487.92	DS Kulkarni	87.91	DS Kulkarni	97.91	DS Kulkarni	92.23	DS Kulkarni	172.94
2	HH Pandya	530.25	HH Pandya	367.44	Ishan Kishan	191.14	HH Pandya	431.94	HH Pandya	515.07	HH Pandya	593.79	Ishan Kishan	380.49
3	Ishan Kishan	333.67	Ishan Kishan	780.16	JJ Bumrah	33.16	Ishan Kishan	328.97	Ishan Kishan	645.64	Ishan Kishan	376.84	JJ Bumrah	125.13
4	JJ Bumrah	174.02	JJ Bumrah	108.73	KA Pollard	268.82	JJ Bumrah	82.09	JJ Bumrah	97.95	JJ Bumrah	84.08	KA Pollard	602.42
5	JL Pattinson	104.37	KA Pollard	648.66	KH Pandya	239.17	KA Pollard	678.53	KA Pollard	628.17	KA Pollard	488.28	KH Pandya	423.75
6	KA Pollard	789.52	KH Pandya	566.24	NM Coulter-Nile	35.85	KH Pandya	239.37	KH Pandya	283.55	KH Pandya	297.40	NM Coulter-Nile	86.63
7	KH Pandya	352.62	NM Coulter-Nile	46.25	Q de Kock	444.65	NM Coulter-Nile	190.86	NM Coulter-Nile	34.93	NM Coulter-Nile	90.90	Q de Kock	611.91
8	Q de Kock	398.12	Q de Kock	531.85	RD Chahar	24.00	Q de Kock	428.69	Q de Kock	252.98	Q de Kock	385.30	RD Chahar	73.52
9	RG Sharma	700.31	RG Sharma	630.69	RG Sharma	733.66	RD Chahar	22.14	RD Chahar	17.90	RD Chahar	81.56	RG Sharma	555.13
10	SA Yadav	619.05	SA Yadav	596.71	SA Yadav	539.12	RG Sharma	692.48	RG Sharma	629.84	RG Sharma	652.87	SA Yadav	562.44
11	TA Boult	133.42	TA Boult	55.62	TA Boult	20.94	SA Yadav	220.48	SA Yadav	554.82	SA Yadav	802.66	SS Tiwary	73.88

Exhibit-6: Suggested Playing-11 from Royal Challengers Bangalore (RCB) Squad along with Rating Against Different Opposition Franchise

RCB XI	Playing-11 For RCB Against Different Opposition Franchise													
	CSK		DC		KKR		PBKS		MI		RR		SRH	
	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s
1	AB de Villiers	645.08	AB de Villiers	798.56	AB de Villiers	699.52	AB de Villiers	598.22	AB de Villiers	777.66	AB de Villiers	856.95	AB de Villiers	930.12
2	AJ Finch	345.56	AJ Finch	302.79	AJ Finch	467.25	AJ Finch	299.89	AJ Finch	404.20	AJ Finch	284.11	AJ Finch	576.14
3	CH Morris	266.80	CH Morris	133.06	CH Morris	153.52	CH Morris	235.37	CH Morris	376.28	CH Morris	280.89	CH Morris	372.73
4	D Padikkal	141.38	Gurkeerat Singh	216.71	D Padikkal	199.07	D Padikkal	94.26	D Padikkal	395.16	D Padikkal	314.30	D Padikkal	221.49
5	Gurkeerat Singh	180.05	M Ali	65.02	Gurkeerat Singh	164.46	Gurkeerat Singh	21.68	N Saini	29.91	Gurkeerat Singh	234.00	DW Steyn	103.38
6	M Ali	283.49	Mohammed Siraj	67.77	M Ali	228.87	I Udana	101.75	S Dube	177.79	M Ali	103.46	Gurkeerat Singh	374.62
7	N Saini	115.54	N Saini	118.77	Mohammed Siraj	31.50	N Saini	106.58	UT Yadav	141.74	Mohammed Siraj	88.48	Mohammed Siraj	108.08
8	UT Yadav	80.04	S Dube	224.26	N Saini	29.05	UT Yadav	74.82	V Kohli	669.80	UT Yadav	168.98	N Saini	78.00
9	V Kohli	1009.31	V Kohli	600.11	UT Yadav	44.87	V Kohli	413.88	Washington Sundar	139.58	V Kohli	833.45	UT Yadav	230.11
10	Washington Sundar	235.95	Washington Sundar	168.61	V Kohli	679.21	Washington Sundar	322.74	YS Chahal	61.52	Washington Sundar	182.29	V Kohli	716.06
11	YS Chahal	116.18	YS Chahal	114.11	YS Chahal	67.14	YS Chahal	57.26	Philippe	203.50	YS Chahal	75.64	Washington Sundar	226.87

Exhibit-7: Suggested Playing-11 from Rajasthan Royals (RR) Squad along with Rating Against Different Opposition Franchise

RR XI	Playing-11 For RR Against Different Opposition Franchise													
	CSK		DC		KKR		PBKS		MI		RCB		SRH	
	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings	Player	Ratings
1	AS Rajpoot	46.69	BA Stokes	409.29	J Archer	189.38	BA Stokes	296.22	AS Rajpoot	64.08	BA Stokes	177.00	AS Rajpoot	78.64
2	BA Stokes	488.92	J Archer	126.05	JC Buttler	439.47	J Archer	123.52	BA Stokes	646.04	J Archer	152.23	BA Stokes	355.47
3	J Archer	296.93	JC Buttler	432.82	JD Unadkat	168.44	JC Buttler	332.53	J Archer	235.68	JC Buttler	515.01	J Archer	169.85
4	JC Buttler	703.48	JD Unadkat	32.43	Kartik Tyagi	53.85	JD Unadkat	43.71	JC Buttler	639.49	JD Unadkat	19.65	JC Buttler	353.54
5	JD Unadkat	132.20	Kartik Tyagi	51.13	R Parag	184.12	R Tewatia	307.81	R Tewatia	106.54	R Parag	115.73	JD Unadkat	44.24
6	R Parag	149.96	R Tewatia	275.02	R Tewatia	184.76	RV Uthappa	417.75	RV Uthappa	451.43	R Tewatia	209.69	R Parag	323.16
7	R Tewatia	136.21	RV Uthappa	609.73	RV Uthappa	95.60	S Gopal	14.76	S Gopal	128.62	RV Uthappa	669.52	R Tewatia	340.15
8	RV Uthappa	519.40	S Gopal	247.12	S Gopal	299.34	SPD Smith	314.92	SPD Smith	512.62	S Gopal	56.78	RV Uthappa	614.42
9	S Gopal	259.51	SPD Smith	286.76	SPD Smith	216.48	SV Samson	671.08	SV Samson	749.15	SPD Smith	627.47	S Gopal	82.96
10	SPD Smith	708.67	SV Samson	285.34	SV Samson	239.94	VR Aaron	36.20	VR Aaron	65.19	SV Samson	513.79	SPD Smith	696.91
11	SV Samson	606.75	VR Aaron	68.62	T Curran	263.57	YBK Jaiswal	0.00	M Lomror	67.42	M Lomror	279.01	SV Samson	787.72

Exhibit-8: Suggested Playing-11 from Sun Risers Hyderabad (SRH) Squad along with Rating Against Different Opposition Franchise

SRH XI	Playing-11 For SRH Against Different Opposition Franchise													
	CSK		DC		KKR		PBKS		MI		RCB		RR	
	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s	Player	Rating s
1	DA Warner	510.71	Abdul Samad	301.61	Abhishek Sharma	15.81	Abhishek Sharma	97.19	Abdul Samad	133.28	Abhishek Sharma	106.70	Abhishek Sharma	-0.25
2	J Bairstow	464.46	DA Warner	754.79	DA Warner	684.57	DA Warner	808.20	DA Warner	757.98	DA Warner	615.56	DA Warner	459.15
3	K Ahmed	29.30	J Bairstow	324.94	J Bairstow	335.01	J Bairstow	413.01	J Bairstow	122.60	J Bairstow	360.65	J Bairstow	268.38
4	KS Williamson	570.33	KS Williamson	601.66	KS Williamson	264.79	KS Williamson	364.35	KS Williamson	379.21	JO Holder	562.75	KS Williamson	466.41
5	MK Pandey	610.67	MK Pandey	675.56	MK Pandey	394.95	MK Pandey	441.43	MK Pandey	642.02	MK Pandey	488.07	MK Pandey	725.37
6	B Kumar	75.29	Mohammad Nabi	190.58	Mohammad Nabi	90.84	Mohammad Nabi	219.96	Mohammad Nabi	293.57	B Kumar	88.83	B Kumar	38.09
7	Rashid Khan	301.35	B Kumar	127.91	B Kumar	24.77	B Kumar	56.51	B Kumar	133.77	Rashid Khan	118.27	Rashid Khan	299.08
8	S Nadeem	206.50	S Nadeem	112.43	S Nadeem	49.41	Sandeep Sharma	109.65	S Nadeem	40.64	Sandeep Sharma	240.51	S Kaul	27.13
9	Sandeep Sharma	62.00	Sandeep Sharma	99.48	Sandeep Sharma	62.36	T Natarajan	33.98	Sandeep Sharma	48.78	T Natarajan	69.73	Sandeep Sharma	55.80
10	V Shankar	534.35	V Shankar	193.97	V Shankar	209.62	V Shankar	318.75	V Shankar	300.32	V Shankar	261.79	V Shankar	456.29
11	WP Saha	351.71	WP Saha	517.39	WP Saha	415.17	WP Saha	217.54	WP Saha	695.71	WP Saha	564.36	WP Saha	337.17