Karnataka Elections

March 26, 2023

1 2018 Karnataka Assembly Elections Analysis

1.1 Import necessary libraries

```
[1]: import pandas as pd
     import numpy as np
     import matplotlib.pyplot as plt
     import seaborn as sns
    df=pd.read_csv("kar.csv")
[2]:
[3]:
[3]:
          AC No.
                             AC Name Winning Party
                                                                 Winning Candidate
     0
                1
                            Nippani
                                                BJP
                                                                  SHASHIKALA JOLLE
                   Chikkodi-Sadalga
     1
                2
                                                TNC
                                                                    GANESH HUKKERI
                                                INC
     2
                3
                              Athani
                                                     MAHESH IRANAGOUDA KUMATHALLI
     3
                4
                                                INC
                                                                   BALASAHEB PATIL
                              Kagwad
     4
                5
                            Kudachi
                                                BJP
                                                                            P RAJIV
                       T. Narasipur
                                                JDS
                                                                       ASHWIN KUMAR
     219
             220
     220
             221
                               Hanur
                                                INC
                                                                         R NARENDRA
     221
             222
                           Kollegal
                                             OTHERS
                                                                           N MAHESH
     222
             223
                     Chamarajanagar
                                                INC
                                                                 PUTTARANGA SHETTY
     223
             224
                          Gundlupet
                                                BJP
                                                                 C S NIRANJANKUMAR
                                                   Runner Up Candidate
         Winner Votes Runner Up Party
                                                KAKASO PANDURANG PATIL
     0
                87,006
                                    INC
                91,467
                                    BJP
                                               ANNASAHEB SHANKAR JOLLE
     1
                82,094
     2
                                    BJP
                                                LAXMAN SANGAPPA SAVADI
     3
                83,060
                                    BJP
                                            BHARAMAGOUDA ALAGOUDA KAGE
     4
                67,781
                                    INC
                                                    AMIT SHAMA GHATAGE
     219
                83,929
                                    INC
                                                   DR. H.C.MAHADEVAPPA
     220
                60,444
                                    BJP
                                                  DR. PREETHAN NAGAPPA
     221
                71,792
                                    INC
                                                   A.R. KRISHNA MURTHY
                75,963
                                                   K R MALLIKARJUNAPPA
     222
                                    BJP
     223
                94,151
                                    INC
                                         M C MOHAN KUMARI URUF GEETHA
```

```
Runner Up Votes Voting Turnout % Total Voters Winning Margin \
                                                                8,506
0
             78,500
                                81.19%
                                             211,827
             80,898
                                84.78%
                                             210,480
                                                               10,569
1
2
             79,763
                                80.67%
                                             213,935
                                                                2,331
3
              50,118
                                79.98%
                                             181,486
                                                               32,942
4
              52,773
                                75.86%
                                             180,233
                                                               15,008
                 •••
219
              55,451
                                78.08%
                                                               28,478
                                             198,434
220
              56,931
                                81.61%
                                             207,603
                                                                3,513
                                             211,522
221
              52,338
                                79.15%
                                                               19,454
222
             71,050
                                80.41%
                                             206,146
                                                                4,913
223
             77,467
                                87.50%
                                             205,616
                                                               16,684
     District Name
0
          BELAGAVI
1
          BELAGAVI
2
          BELAGAVI
3
          BELAGAVI
          BELAGAVI
219
            MYSORE
220
     CHAMARAJNAGAR
221
     CHAMARAJNAGAR
222
     CHAMARAJNAGAR
223
     CHAMARAJNAGAR
```

2 Making the Data Ready for analysis

[224 rows x 12 columns]

```
[4]: df.drop("AC No.",axis=1,inplace=True)
[5]:
[5]:
                    AC Name Winning Party
                                                        Winning Candidate
     0
                    Nippani
                                                         SHASHIKALA JOLLE
                                       BJP
          Chikkodi-Sadalga
                                                            GANESH HUKKERI
     1
                                       INC
     2
                     Athani
                                       INC
                                            MAHESH IRANAGOUDA KUMATHALLI
     3
                     Kagwad
                                       INC
                                                           BALASAHEB PATIL
     4
                    Kudachi
                                       BJP
                                                                   P RAJIV
     219
                                                              ASHWIN KUMAR
              T. Narasipur
                                       JDS
     220
                      Hanur
                                       INC
                                                                R NARENDRA
     221
                   Kollegal
                                    OTHERS
                                                                  N MAHESH
     222
                                                        PUTTARANGA SHETTY
            Chamarajanagar
                                       INC
```

223	Gundlupet	F	3JP	C S NIRANJANKUMA	AR
Ţ	Winner Votes Runner	Up Party	Run	ner Up Candidate	\
0	87,006	INC		PANDURANG PATIL	`
1	91,467	ВЈР		EB SHANKAR JOLLE	
2	82,094	ВЈР		SANGAPPA SAVADI	
3	83,060	ВЈР		DA ALAGOUDA KAGE	
4	67,781	INC		IT SHAMA GHATAGE	
219	83,929	INC	DR.	H.C.MAHADEVAPPA	
220	60,444	ВЈР		PREETHAN NAGAPPA	
221	71,792	INC		. KRISHNA MURTHY	
222	75,963	ВЈР		MALLIKARJUNAPPA	
223	94,151	INC		MARI URUF GEETHA	
	,				
I	Runner Up Votes Voti	ng Turnou	ıt % Total Vot	ers Winning Margin	ı \
0	78,500	•	19% 211,		
1	80,898	84.	78% 210,		
2	79,763	80.	67% 213,	935 2,333	1
3	50,118	79.	98% 181,	486 32,942	2
4	52,773	75.	86% 180,	233 15,008	3
	•••	***	•••	•••	
219	55,451	78.	08% 198,	434 28,478	3
220	56,931	81.	61% 207,	603 3,513	3
221	52,338	79.	15% 211,	522 19,454	1
222	71,050	80.	41% 206,	146 4,913	3
223	77,467	87.	50% 205,	616 16,684	1
	District Name				
0	BELAGAVI				
1	BELAGAVI				
2	BELAGAVI				
3	BELAGAVI				
4	BELAGAVI				
	•••				
219	MYSORE				
220	CHAMARAJNAGAR				
221	CHAMARAJNAGAR				
222	CHAMARAJNAGAR				
223	CHAMARAJNAGAR				
	_				
T224	rows v 11 columns]				

[224 rows x 11 columns]

[6]: df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 224 entries, 0 to 223

```
#
         Column
                               Non-Null Count
                                               Dtype
         _____
                               _____
     0
         AC Name
                               224 non-null
                                               object
     1
         Winning Party
                               224 non-null
                                               object
     2
         Winning Candidate
                               224 non-null
                                               object
     3
         Winner Votes
                               224 non-null
                                               object
         Runner Up Party
                               224 non-null
                                               object
     5
         Runner Up Candidate 224 non-null
                                               object
         Runner Up Votes
     6
                               224 non-null
                                               object
     7
         Voting Turnout %
                               224 non-null
                                               object
     8
         Total Voters
                               223 non-null
                                               object
         Winning Margin
                               224 non-null
                                               object
     10 District Name
                               224 non-null
                                               object
    dtypes: object(11)
    memory usage: 19.4+ KB
[7]: df.isna().sum()
[7]: AC Name
                            0
     Winning Party
                            0
     Winning Candidate
                            0
     Winner Votes
                            0
     Runner Up Party
                            0
     Runner Up Candidate
                            0
     Runner Up Votes
                            0
    Voting Turnout %
                            0
     Total Voters
                            1
     Winning Margin
                            0
     District Name
                            0
     dtype: int64
[8]: lst=["Winner Votes", "Runner Up Votes", "Voting Turnout %", "Total

¬Voters","Winning Margin"]
     for i in lst:
         df[i]=df[i].str.replace(",","")
         df[i]=df[i].str.replace("%","")
[9]: df
[9]:
                   AC Name Winning Party
                                                      Winning Candidate \
     0
                   Nippani
                                      BJP
                                                       SHASHIKALA JOLLE
     1
          Chikkodi-Sadalga
                                      INC
                                                         GANESH HUKKERI
     2
                    Athani
                                      INC
                                          MAHESH IRANAGOUDA KUMATHALLI
     3
                    Kagwad
                                      INC
                                                        BALASAHEB PATIL
     4
                   Kudachi
                                      BJP
                                                                P RAJIV
```

Data columns (total 11 columns):

219 220 221 222 223	T. Narasipur Hanur Kollegal Chamarajanagar Gundlupet	JDS INC OTHERS INC BJP	ASHWIN KUMAR R NARENDRA N MAHESH PUTTARANGA SHETTY C S NIRANJANKUMAR
0 1 2 3 4 219	Winner Votes Runner Up 87006 91467 82094 83060 67781 83929	Party INC BJP BJP BJP INC	Runner Up Candidate \ KAKASO PANDURANG PATIL ANNASAHEB SHANKAR JOLLE LAXMAN SANGAPPA SAVADI HARAMAGOUDA ALAGOUDA KAGE AMIT SHAMA GHATAGE DR. H.C.MAHADEVAPPA
220	60444	BJP	DR. PREETHAN NAGAPPA
221 222	71792 75963	INC BJP	A.R. KRISHNA MURTHY K R MALLIKARJUNAPPA
223	94151		MOHAN KUMARI URUF GEETHA
0 1 2 3 4 219 220 221 222 223	Runner Up Votes Voting 78500 80898 79763 50118 52773 55451 56931 52338 71050 77467	Turnout % 3 81.19 84.78 80.67 79.98 75.86 78.08 81.61 79.15 80.41 87.50	Total Voters Winning Margin \ 211827 8506 210480 10569 213935 2331 181486 32942 180233 15008 198434 28478 207603 3513 211522 19454 206146 4913 205616 16684
0 1 2 3 4 219 220 221 222 223	District Name BELAGAVI BELAGAVI BELAGAVI BELAGAVI BELAGAVI MYSORE CHAMARAJNAGAR CHAMARAJNAGAR CHAMARAJNAGAR CHAMARAJNAGAR		

[224 rows x 11 columns]

```
[10]: lst1=["Winner Votes", "Runner Up Votes", "Total Voters", "Winning Margin"]
      for i in lst1:
          print(i+":"+str(df[i].str.isnumeric().sum()))
     Winner Votes:222
     Runner Up Votes:222
     Total Voters:223
     Winning Margin:222
[11]: df[~df["Winner Votes"].str.isnumeric()]
[11]:
                       AC Name Winning Party Winning Candidate Winner Votes \
          Rajarajeshwarinagar
      172
                     Jayanagar
          Runner Up Party Runner Up Candidate Runner Up Votes Voting Turnout % \
      153
      172
          Total Voters Winning Margin
                                            District Name
      153
                471459
                                     - B.B.M.P (CENTRAL)
      172
                203184
                                           B.B.M.P(SOUTH)
[12]: df=df.drop(index=[153,172],axis=0)
[13]: df
[13]:
                    AC Name Winning Party
                                                       Winning Candidate
                                                         SHASHIKALA JOLLE
      0
                    Nippani
      1
           Chikkodi-Sadalga
                                       INC
                                                           GANESH HUKKERI
      2
                     Athani
                                       INC MAHESH IRANAGOUDA KUMATHALLI
      3
                     Kagwad
                                       INC
                                                          BALASAHEB PATIL
      4
                                       BJP
                    Kudachi
                                                                  P RAJIV
      219
               T. Narasipur
                                       JDS
                                                             ASHWIN KUMAR
      220
                      Hanur
                                       INC
                                                               R NARENDRA
                   Kollegal
      221
                                    OTHERS
                                                                 N MAHESH
      222
             Chamarajanagar
                                       INC
                                                       PUTTARANGA SHETTY
      223
                  Gundlupet
                                       BJP
                                                       C S NIRANJANKUMAR
          Winner Votes Runner Up Party
                                                  Runner Up Candidate
      0
                 87006
                                               KAKASO PANDURANG PATIL
                                    INC
                                    BJP
      1
                 91467
                                              ANNASAHEB SHANKAR JOLLE
                 82094
                                    BJP
                                               LAXMAN SANGAPPA SAVADI
      3
                 83060
                                    BJP
                                           BHARAMAGOUDA ALAGOUDA KAGE
                 67781
                                    INC
                                                    AMIT SHAMA GHATAGE
      4
```

```
219
                 83929
                                    INC
                                                   DR. H.C.MAHADEVAPPA
      220
                  60444
                                    BJP
                                                  DR. PREETHAN NAGAPPA
      221
                  71792
                                    INC
                                                   A.R. KRISHNA MURTHY
      222
                                                   K R MALLIKARJUNAPPA
                  75963
                                    BJP
      223
                  94151
                                    INC M C MOHAN KUMARI URUF GEETHA
          Runner Up Votes Voting Turnout % Total Voters Winning Margin \
                     78500
                                       81.19
                                                                     8506
      0
                                                   211827
                     80898
                                       84.78
                                                                    10569
      1
                                                   210480
      2
                     79763
                                       80.67
                                                   213935
                                                                     2331
      3
                                       79.98
                                                                    32942
                     50118
                                                   181486
      4
                     52773
                                       75.86
                                                   180233
                                                                    15008
      . .
                      •••
      219
                     55451
                                       78.08
                                                   198434
                                                                    28478
      220
                     56931
                                       81.61
                                                   207603
                                                                     3513
      221
                     52338
                                       79.15
                                                   211522
                                                                    19454
      222
                                       80.41
                     71050
                                                   206146
                                                                     4913
      223
                     77467
                                       87.50
                                                   205616
                                                                    16684
           District Name
      0
                BELAGAVI
      1
                BELAGAVI
      2
                BELAGAVI
      3
                BELAGAVI
      4
                BELAGAVI
                  MYSORE
      219
      220
          CHAMARAJNAGAR
      221
           CHAMARAJNAGAR
      222 CHAMARAJNAGAR
      223 CHAMARAJNAGAR
      [222 rows x 11 columns]
[14]: | lst1=["Winner Votes", "Runner Up Votes", "Total Voters", "Winning Margin"]
      for i in lst1:
          print(i+":"+str(df[i].str.isnumeric().sum()))
     Winner Votes:222
     Runner Up Votes:222
     Total Voters:221
     Winning Margin:222
[15]: df['Total Voters'].isna().sum()
```

[15]: 1

```
[16]: df=df.dropna()
     df
[17]:
[17]:
                     AC Name Winning Party
                                                          Winning Candidate
                                                           SHASHIKALA JOLLE
      0
                     Nippani
                                         BJP
      1
           Chikkodi-Sadalga
                                         INC
                                                             GANESH HUKKERI
      2
                      Athani
                                         INC
                                              MAHESH IRANAGOUDA KUMATHALLI
      3
                      Kagwad
                                         INC
                                                            BALASAHEB PATIL
                                                                     P RAJIV
      4
                     Kudachi
                                         BJP
      . .
      219
                T. Narasipur
                                         JDS
                                                               ASHWIN KUMAR
      220
                       Hanur
                                         INC
                                                                  R NARENDRA
      221
                    Kollegal
                                     OTHERS
                                                                    N MAHESH
      222
              Chamarajanagar
                                         INC
                                                          PUTTARANGA SHETTY
      223
                                                          C S NIRANJANKUMAR
                   Gundlupet
                                         BJP
          Winner Votes Runner Up Party
                                                     Runner Up Candidate
      0
                  87006
                                     INC
                                                 KAKASO PANDURANG PATIL
      1
                  91467
                                     BJP
                                                ANNASAHEB SHANKAR JOLLE
      2
                  82094
                                     BJP
                                                 LAXMAN SANGAPPA SAVADI
      3
                  83060
                                     BJP
                                             BHARAMAGOUDA ALAGOUDA KAGE
      4
                  67781
                                     INC
                                                      AMIT SHAMA GHATAGE
      219
                  83929
                                                    DR. H.C.MAHADEVAPPA
                                     INC
      220
                                     BJP
                                                   DR. PREETHAN NAGAPPA
                  60444
                                                    A.R. KRISHNA MURTHY
      221
                  71792
                                     INC
      222
                  75963
                                     BJP
                                                     K R MALLIKARJUNAPPA
                                           M C MOHAN KUMARI URUF GEETHA
      223
                  94151
                                     INC
          Runner Up Votes Voting Turnout % Total Voters Winning Margin
      0
                     78500
                                        81.19
                                                     211827
                                                                       8506
      1
                     80898
                                        84.78
                                                     210480
                                                                      10569
      2
                     79763
                                        80.67
                                                                       2331
                                                     213935
      3
                                        79.98
                                                                      32942
                     50118
                                                     181486
      4
                     52773
                                        75.86
                                                     180233
                                                                      15008
                     55451
                                        78.08
                                                                      28478
      219
                                                     198434
      220
                     56931
                                       81.61
                                                     207603
                                                                       3513
                                       79.15
                                                                      19454
      221
                     52338
                                                    211522
      222
                     71050
                                       80.41
                                                    206146
                                                                       4913
      223
                     77467
                                       87.50
                                                     205616
                                                                      16684
           District Name
      0
                 BELAGAVI
      1
                 BELAGAVI
      2
                 BELAGAVI
```

```
3 BELAGAVI
4 BELAGAVI
.. ...
219 MYSORE
220 CHAMARAJNAGAR
221 CHAMARAJNAGAR
222 CHAMARAJNAGAR
223 CHAMARAJNAGAR
```

[221 rows x 11 columns]

[18]: lst1=["Winner Votes","Runner Up Votes","Total Voters","Winning Margin"] for i in lst1: df[i]=df[i].astype(int)

/tmp/ipykernel_102/26254697.py:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy df[i]=df[i].astype(int)

[19]: df.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 221 entries, 0 to 223
Data columns (total 11 columns):

#	Column	Non-Null Count	Dtype
0	AC Name	221 non-null	object
1	Winning Party	221 non-null	object
2	Winning Candidate	221 non-null	object
3	Winner Votes	221 non-null	int64
4	Runner Up Party	221 non-null	object
5	Runner Up Candidate	221 non-null	object
6	Runner Up Votes	221 non-null	int64
7	Voting Turnout %	221 non-null	object
8	Total Voters	221 non-null	int64
9	Winning Margin	221 non-null	int64
10	District Name	221 non-null	object

dtypes: int64(4), object(7)
memory usage: 20.7+ KB

```
[20]: df["Voting Turnout %"]=df["Voting Turnout %"].astype(float)
```

/tmp/ipykernel_102/2805306349.py:1: SettingWithCopyWarning: A value is trying to be set on a copy of a slice from a DataFrame.

Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy df["Voting Turnout %"]=df["Voting Turnout %"].astype(float)

[21]: df.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 221 entries, 0 to 223
Data columns (total 11 columns):

#	Column	Non-Null Count	Dtype
0	AC Name	221 non-null	object
1	Winning Party	221 non-null	object
2	Winning Candidate	221 non-null	object
3	Winner Votes	221 non-null	int64
4	Runner Up Party	221 non-null	object
5	Runner Up Candidate	221 non-null	object
6	Runner Up Votes	221 non-null	int64
7	Voting Turnout %	221 non-null	float64
8	Total Voters	221 non-null	int64
9	Winning Margin	221 non-null	int64
10	District Name	221 non-null	object
34	£7+ C4 (4)+ C4	(4) -1-:+(C)	

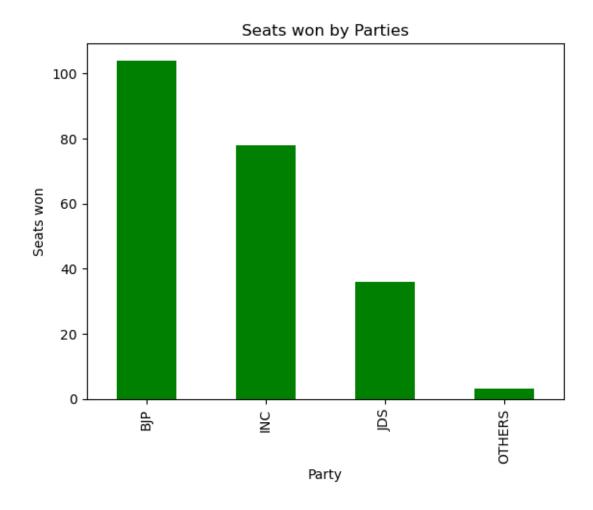
dtypes: float64(1), int64(4), object(6)

memory usage: 20.7+ KB

3 Visualization

```
[56]: df["Winning Party"].value_counts().plot(kind="bar",color="g")
    plt.xlabel("Party")
    plt.ylabel("Seats won")
    plt.title("Seats won by Parties")
```

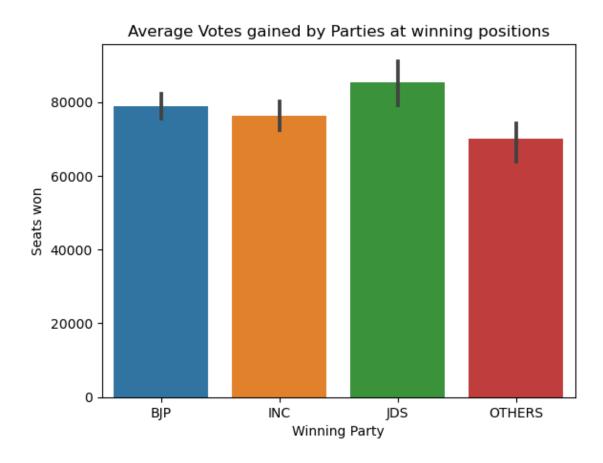
[56]: Text(0.5, 1.0, 'Seats won by Parties')



- 4.1 BJP won most number of seats, but didn't have magic figure.
- 4.2 Jds plays crucial role to form government.

```
[23]: sns.barplot(x=df["Winning Party"],y=df["Winner Votes"])
   plt.xlabel("Winning Party")
   plt.ylabel("Seats won")
   plt.title("Seats won by Parties")
   plt.title("Average Votes gained by Parties at winning positions")
```

[23]: Text(0.5, 1.0, 'Average Votes gained by Parties at winning positions')

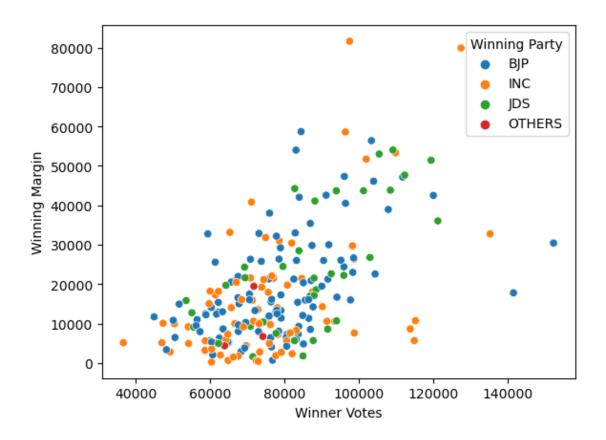


5.1 JDS got more number of votes in their winning seats. That implies although they won less seats, they have more grip on voters in the places which they had own

```
[24]: sns.scatterplot(x=df["Winner Votes"],y=df["Winning Margin"],hue=df["Winning

→Party"])
```

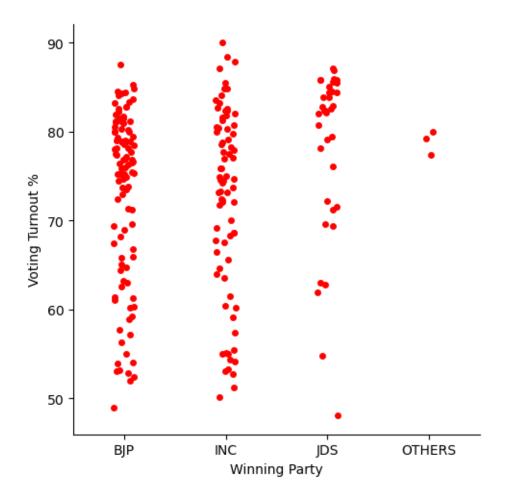
[24]: <AxesSubplot: xlabel='Winner Votes', ylabel='Winning Margin'>



- 6.1 INC won most seats with below 25k margin
- 6.2 But JDS and BJP won reasonable seats from 30k to 60k margins.

```
[54]: sns.catplot(x=df["Winning Party"],y=df["Voting Turnout %"],color="r")
```

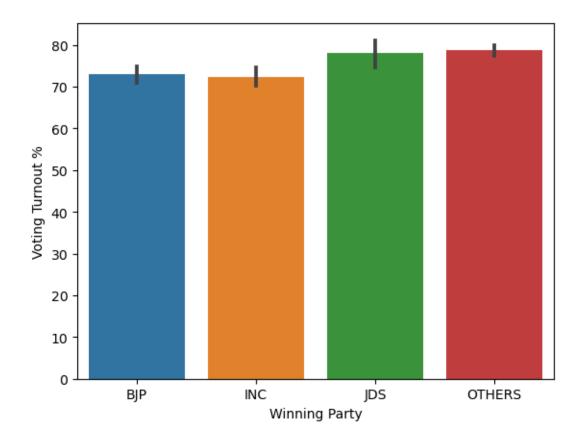
[54]: <seaborn.axisgrid.FacetGrid at 0x7f46bbe1a0e0>



- 7.1 Others own 3 seats, that too only when Voting Turnout is more than 75%
- 7.2 JDS also own most seats when Turnout is more than 75% only
- 7.3 When Turnout is below 60%, BJP and INC won most seats
- 7.4 BJP won most seats if Turnout is between 75 and 85

```
[26]: sns.barplot(x=df["Winning Party"],y=df["Voting Turnout %"])
```

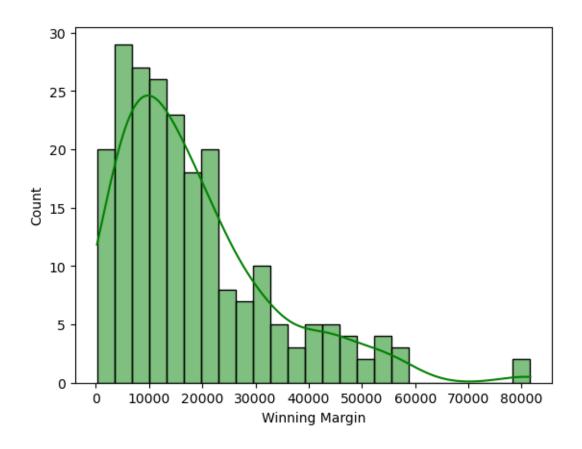
[26]: <AxesSubplot: xlabel='Winning Party', ylabel='Voting Turnout %'>



8.1 If more people were voting, JDS and Others have high chances of Winning

```
[53]: sns.histplot(df["Winning Margin"],bins=25,kde=True,color="g")
```

[53]: <AxesSubplot: xlabel='Winning Margin', ylabel='Count'>



- 9.1 Generally 1 to 25,000 is the normal range of winning candidates margin
- 9.2 from 25k to 60k only few candidates got Margins
- 9.3 above 70k Margin is very very rare

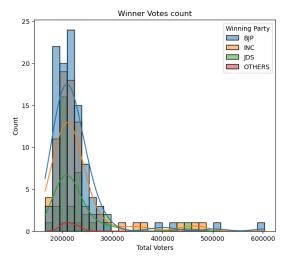
INC 4710434 JDS 2241946 OTHERS 179408

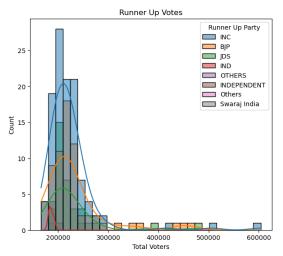
Name: Runner Up Votes, dtype: int64

[30]: df.groupby("Runner Up Party").count()

	AC Name Wi	nning Party	Winning Cand	lidate Wir	ner Votes
Runner Up Party					
ВЈР	67	67		67	67
INC	111	111		111	111
IND	3	3		3	3
INDEPENDENT	1	1		1	1
JDS	36	36		36	36
OTHERS	1	1		1	1
Others	1	1		1	1
Swaraj India	1	1		1	1
	Runner Up C	andidate Ru	nner Up Votes	S Voting T	Turnout %
Runner Up Party	1		•	G	••
ВЈР		67	67	•	67
INC		111	111	-	111
IND		3	3	3	3
INDEPENDENT		1	1	-	1
JDS		36	36	3	36
OTHERS		1	1		1
Others		1	1		1
Swaraj India		1	1		1
	Total Voter	s Winning M	argin Distri	.ct Name	
Runner Up Party		C	C		
ВЈР	6	7	67	67	
INC	11	1	111	111	
IND		3	3	3	
INDEPENDENT		1	1	1	
JDS	3	6	36	36	
OTHERS		1	1	1	
Others		1	1	1	
Swaraj India		1	1	1	

10.1 Although INC has more Runner up Seats, BJP won more votes in Runner up Seats. i.e, BJP Managed to get most votes in their Lost seats also.



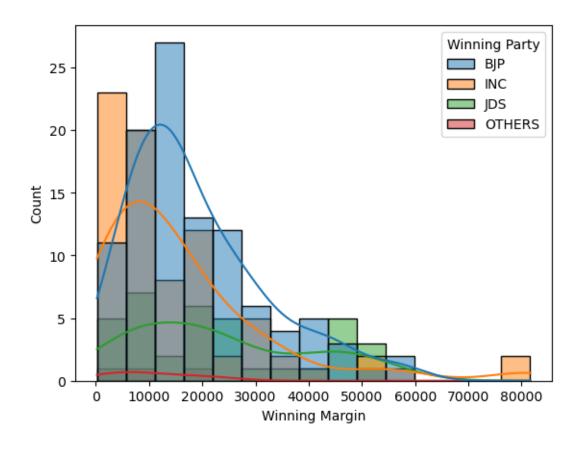


11 Observations:

11.1 If Total Voters were less than 300,000 then BJP had a very good dominance

```
[60]: sns.histplot(data=df,x="Winning Margin",kde=True,color="r",hue="Winning Party")
```

[60]: <AxesSubplot: xlabel='Winning Margin', ylabel='Count'>



- 12.1 Others had a maximum Margin of wins by less than 25k votes only.
- 12.2 INC has most margins below 5000 and also most marin of victories above 65k votes.
- 12.3 JDS Dominated INC at 40k to 60k Margin of Victories.
- 12.4 BJP Dominates from 10k to 50k margin of victories.