Indian Presidential Election Prediction Model

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Abstract – The President of India is indirectly elected by an Electoral College consisting of the elected members of both houses of parliament, the elected members of the Legislative assemblies of the 28 states, and the elected members of the legislative assemblies of the Union Territories of Delhi, Puducherry and Jammu and Kashmir. Experimental results show that the proposed Prediction Model can show the value of votes of elected Members of the Legislative Assemblies, Members of Parliament from each state & party in the Electoral College.

Keywords – Electoral College, Members of the Legislative Assemblies (MLAs), Members of Parliament (MPs), States, Union Territories (UTs), Political Parties, MATLAB, Microsoft Excel

I. INTRODUCTION

The president of India, known officially as the president of the Republic of India, is the head of state of the Republic of India.

Article 58 of the constitution sets the qualifications one must meet to be eligible for the office of the president. A president must be:

- a citizen of India
- of 35 years of age or above
- qualified to become a member of the Lok Sabha.

The president is indirectly elected by an electoral college comprising both houses of the Parliament of India and the legislative assemblies of each of India's states and territories, who themselves are all directly elected.

The presidential electoral college is made up of the following:

- elected members of the Rajya Sabha (upper house of the Parliament of India);
- elected members of the Lok Sabha (lower house of the Parliament of India);
- elected members of each state's Legislative Assembly (lower house of the state legislature); and
- elected members of each union territory possessing a Legislative assembly (i.e. Delhi, (Jammu & Kashmir not included) and Puducherry, etc.)

The value of votes cast by elected members of the state legislative assemblies and both houses of parliament are determined by the provisions of Article 55(2) of the Constitution of India. Per the 84th Amendment, the 1971 census is used and will continue to be used until 2026.

The formula for determining the number of votes held by an MLA is:

$$Value\ of\ an\ MLA\ vote = \frac{x}{1000 \times y} \qquad (1)$$

Where: x = Total population of the state or union territory according to 1971 census & y = Total number of elected members of the State legislative assembly

The value of an MP's vote is calculated by dividing the total value of all MLAs' votes by the number of MPs. The formula for determining the number of votes held by an MP is:

$$Value\ of\ an\ MP\ vote = \frac{a}{b} \qquad (2)$$

Where: a = The sum of vote value of elected members of all the State Legislative Assemblies & b = The sum of elected members of both the Houses of Parliament.

The program for the Prediction Model is written using the (1) & (2). In the following sections, Section II introduces the proposed Prediction Model in detail. Section III presents the experimental results of the working Model & shows the output of the program. Section IV will deal with applications of the Prediction Model. Finally, conclusions are drawn in Section V.

II. PROPOSED PREDICTION MODEL

The proposed Prediction Model program could have been written in C++, Java, or Python, but instead was written in MATLAB. The reason for writing this program in MATLAB is that the necessary commands & function generation are accessible in MATLAB, and MATLAB's programming language is simple.

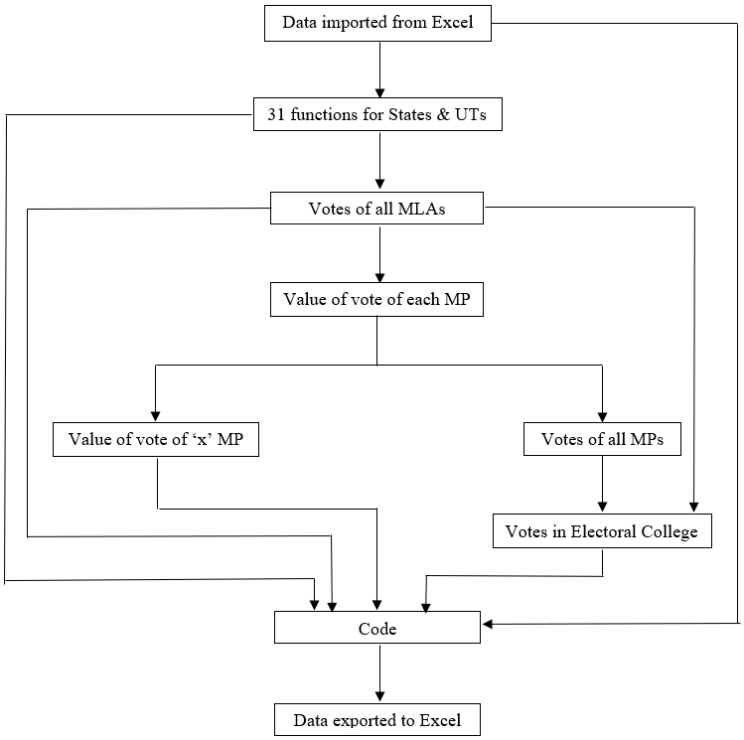

Figure 1 – Flowchart of the Model

Figure 1 shows the Flowchart of the entire Prediction Model. The entire Data of MLAs & MPs in each state & union territory & of each political party are mentioned in the Database Microsoft Excel File. The population of every state & union territory according to the 1971 Census is also mentioned in this Excel File. This Excel File not only contains the 1971 Census but also contains the 2011 Census & 2022 Estimate Population. This Excel File is editable to the user & the data here can be changed easily making the input data of the Prediction Model dynamic.

The data from Excel first goes to 31 different functions named after every 28 states, Delhi, Puducherry, and Jammu and Kashmir. These 31 functions return the value of the number of MLAs votes in each state using the first formula. The number of MLA has to be given as input to the function.

The total number of elected MLAs in each state is given to respective functions in the "Value of all MLAs votes" function. This function returns the value of all the MLA votes in the Electoral College which is 5,49,495.

The value of all MLA votes in the Electoral College is used to calculate the value of each MP using the second formula which is 708 in "Value of each MP's vote" function. This value is sent in two places – "Value of 'x' number of MPs vote" function & "Value of all MPs vote" function.

The "Value of 'x' number of MPs vote" function is used to calculate the value of votes of a certain number of MPs votes. The "Value of all MPs vote" function imports the number of elected MPs to calculate the value of total MPs vote in the Electoral College which is 5,49,408.

The values from the "Value of all MLAs votes" & "Value of all MPs vote" functions are added to calculate the entire value of the Electoral College which is 10,98,903 votes in the "All Votes" function.

This is how the 36 functions of the Model is written – 31 for states & union territories, 5 for "Value of all MLAs votes", "Value of each MP's vote", "Value of 'x' number of MPs vote", "Value of all MPs vote" & "All Votes" functions. All these 36 functions are used in the code. The data from Excel is also imported to the code.

The code is divided into two slave codes & one Master code – the first slave code deals with the results according to states & union territories & the second slave code deals with the results according to political parties. These two slave codes are run using a Master code which will be only been seen to the user. This Master code has only two lines of code which are run commands for the two main codes. The four tables that are formed using the Model are then exported to another Microsoft Excel File named "Result".

III. EXPERIMENTAL RESULTS

The output which is presented in this paper is using the data as of 23rd March 2022.

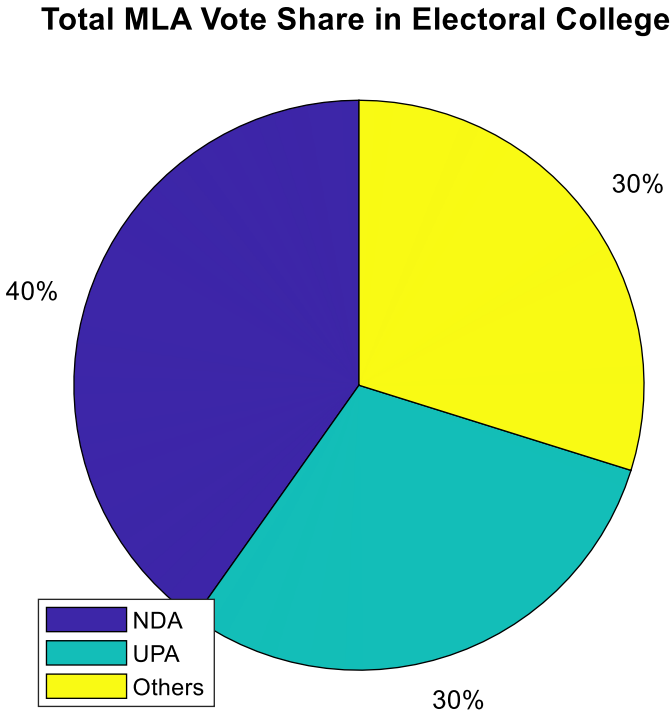

Figure 2 – Total MLA Vote Share in Electoral College

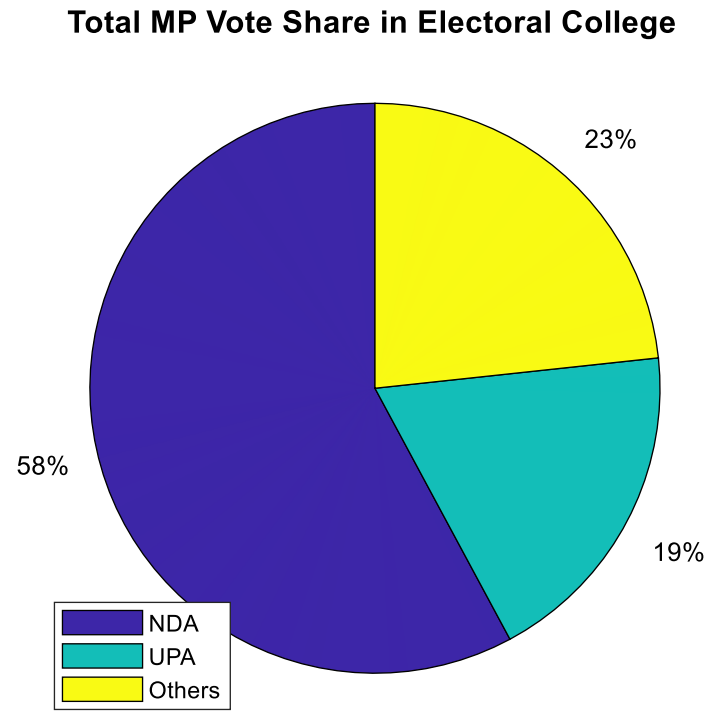

Figure 3 – Total MP Vote Share in Electoral College

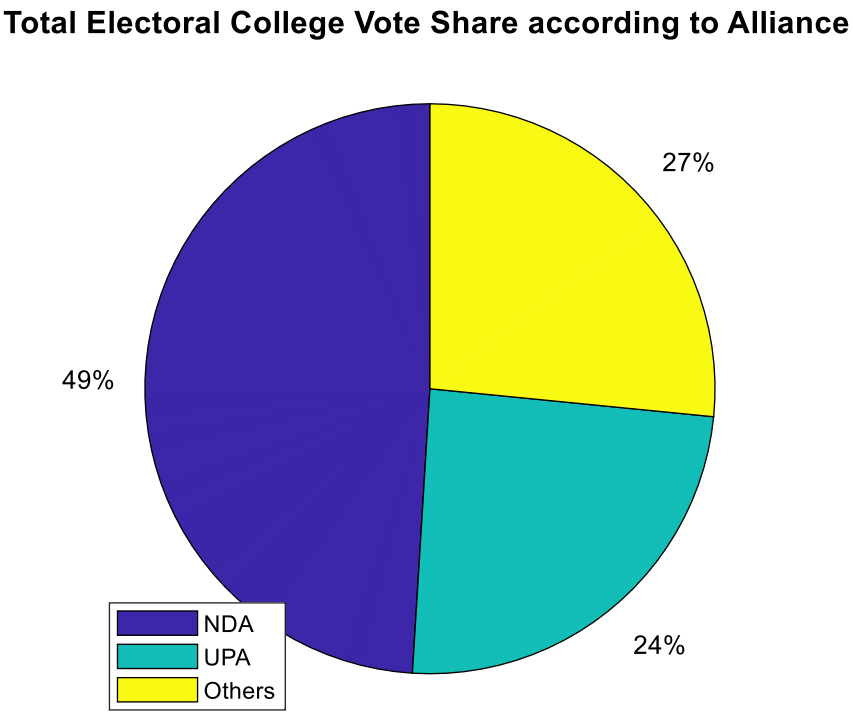

Figure 4 – Total Electoral College Vote Share according to Alliance

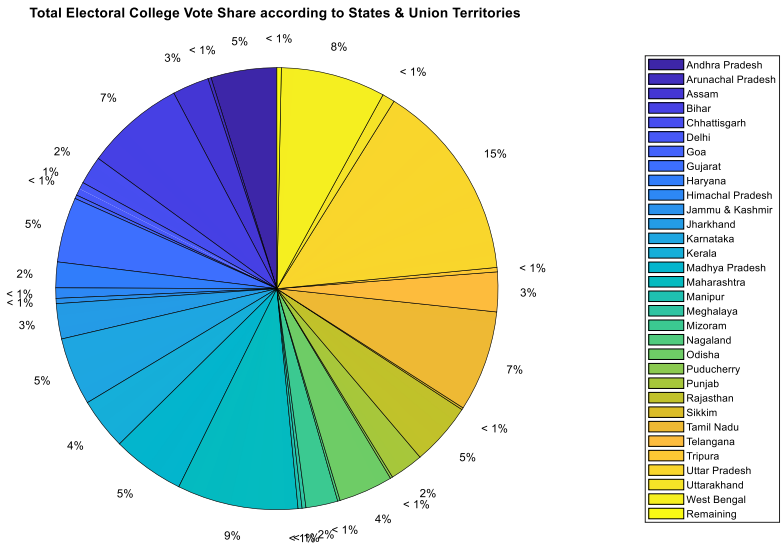

Figure 5 – Total Electoral College Vote Share according to States & Union Territories

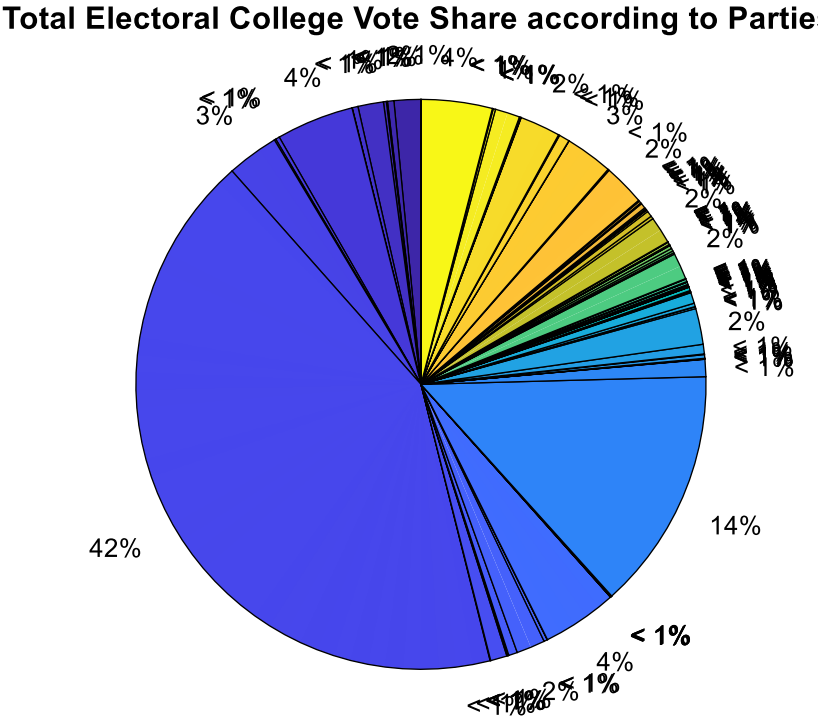

Figure 6 – Total Electoral College Vote Share according to Parties

PDF 1 – Tabular Output of the Model (Attached at the end of the Paper)

The above figures & PDF shows the proposed Prediction Model. Figure 2 shows the Total MLA Vote Share in Electoral College. It shows that National Democratic Alliance (NDA) has 40% of the MLA vote share in the Electoral College while United Progressive Alliance (UPA) has 30% & Others have 30% of the MLA vote share in the Electoral College.

Figure 3 shows the Total MP Vote Share in Electoral College. It shows that NDA has 58% of the MP vote share in the Electoral College while UPA has 19% & Others have 23% of the MP vote share in the Electoral College.

Figure 4 shows the Total Electoral College Vote Share according to Alliance. It shows that NDA has 49% of the vote share in the Electoral College while UPA has 24% & Others have 27% of the vote share in the Electoral College. This indicates that even though NDA has a majority, they don't have the required majority to win the Presidential Election of 2022 without the support of Other parties who are currently not member parties of UPA.

Figure 5 shows the Total Electoral College Vote Share according to states & union territories. The Pie Chart can be used with the support of Table 3 which also shows the same data but in tabular format which is more readable here.

Figure 6 shows the Total Electoral College Vote Share according to Parties. The Pie Chart is not clear and the reason for the same is that the Electoral College currently consists of 98 Parties. The Pie Chart can be better be understood using Table 4 in the PDF attached below. It shows the percentage share of each political party in the Electoral College. Using Table 4, we can determine who can help NDA to acquire the required majority & see that if a united front of UPA & Other parties is made, it could lead to the President of their choice.

There are more three tables in the output. The first table (Table 1) is MLAs' vote status in Electoral College according to Alliances. This table shows the MLA vote status of each state & union territory in the Electoral College according to Alliances. The second table (Table 2) is MPs' vote status in Electoral College according to Alliances. This table shows the MP vote status of each state & union territory in the Electoral College according to Alliances.

IV. APPLICATIONS

Indian Presidential Election Prediction Model, presented in this paper is very useful during every Presidential Election not only in 2022 but also the future elections as the input data could be easily changed in the Microsoft Excel file. The output of this Model is in Graphical & Tabular formats which could help the user to analyze the situation of the Electoral College & could be used to form alliances. The 1971 Census will be used till 2026 according to 84th Amendment. This model could be used to see the status of the Vote Share of each state & union territory in the Electoral College using the 2011 Census & 2022 Estimate Population as the base population.

V. CONCLUSION

Experimental results indicate that the proposed model has significant usage in predicting in graphical as well as tabular format, the status of the Electoral College according to alliances, states & parties. One of the drawbacks of the purposed model in this paper is that MATLAB takes 2 and half minutes to execute the code as there are 992 codes to be executed with data to be imported from & exported to different Microsoft Excel sheets. Another drawback is that to execute the code, MATLAB is required. The future development of this project would be making this project a Standalone Project which won't require MATLAB to execute the project.

Acknowledgment

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The percentage of MLAs voted are 98.56%

Table 1 - MLAs vote status in Electoral College according to Alliances

Sr_No	State	NDA_MLA	UPA_MLA	Others_MLA	NDA_MLA_Votes	UPA_MLA_Votes	Others_MLA_Votes	Total_MLA_Votes
1	"Andhra Pradesh"	1	0	173	159	0	27507	27666
2	"Arunachal Pradesh"	54	4	2	432	32	16	480
3	"Assam"	79	28	19	9164	3248	2204	14616
4	"Bihar"	127	110	5	21971	19030	865	41866
5	"Chhattisgarh"	14	70	5	1806	9030	645	11481
6	"Delhi"	8	0	62	464	0	3596	4060
7	"Goa"	25	12	3	500	240	60	800
8	"Gujarat"	111	65	3	16317	9555	441	26313
9	"Haryana"	56	31	3	6272	3472	336	10080
10	"Himachal Pradesh"	43	22	3	2193	1122	153	3468
11	"Jammu & Kashmir"	0	0	0	0	0	0	0
12	"Jharkhand"	28	51	2	4928	8976	352	14256
13	"Karnataka"	122	70	32	15982	9170	4192	29344
14	"Kerala"	0	40	99	0	6080	15048	21128
15	"Madhya Pradesh"	131	96	3	17161	12576	393	30130
16	"Maharashtra"	113	170	4	19775	29750	700	50225

17	"Manipur"	44	5	11	792	90	198 ↙ 1080
18	"Meghalaya"	41	6	13	697	102	221 ↙ 1020
19	"Mizoram"	1	5	34	8	40	272 ↙ 320
20	"Nagaland"	60	0	0	540	0	0 ↙ 540
21	"Odisha"	23	10	114	3427	1490	16986 ↙ 21903
22	"Puducherry"	22	8	0	352	128	0 ↙ 480
23	"Punjab"	2	19	96	232	2204	11136 ↙ 13572
24	"Rajasthan"	71	121	8	9159	15609	1032 ↙ 25800
25	"Sikkim"	31	0	1	217	0	7 ↙ 224
26	"Tamil Nadu"	75	159	0	13200	27984	0 ↙ 41184
27	"Telangana"	3	6	110	396	792	14520 ↙ 15708
28	"Tripura"	40	0	15	1040	0	390 ↙ 1430
29	"Uttar Pradesh"	273	2	128	56784	416	26624 ↙ 83824
30	"Uttarakhand"	49	19	2	3136	1216	128 ↙ 4480
31	"West Bengal"	70	0	222	10570	0	33522 ↙ 44092
32	"Total"	1717	1129	1172	2.1767e+05	1.6235e+05	1.6154e+05 ↙ 5.4157e+05

The percentage of MPs voted are 98.45%

Table 2 - MPs vote status in Electoral College according to Alliances

Sr_No	State	NDA_MP	UPA_MP	Others_MP	NDA_MP_Votes	UPA_MP_Votes	Others_MP_Votes ↙ Total_MP_Votes

1	"Andhra Pradesh"	4	0	32	2832	0	22656 ↙ 25488
2	"Arunachal Pradesh"	3	0	0	2124	0	0 ↙ 2124
3	"Assam"	13	5	3	9204	3540	2124 ↙ 14868
4	"Bihar"	47	2	5	33276	1416	3540 ↙ 38232
5	"Chhattisgarh"	12	4	0	8496	2832	0 ↙ 11328
6	"Delhi"	7	0	3	4956	0	2124 ↙ 7080
7	"Goa"	2	1	0	1416	708	0 ↙ 2124
8	"Gujarat"	34	3	0	24072	2124	0 ↙ 26196
9	"Haryana"	13	1	1	9204	708	708 ↙ 10620
10	"Himachal Pradesh"	5	2	0	3540	1416	0 ↙ 4956
11	"Jammu & Kashmir"	3	3	0	2124	2124	0 ↙ 4248
12	"Jharkhand"	16	4	0	11328	2832	0 ↙ 14160
13	"Karnataka"	32	6	1	22656	4248	708 ↙ 27612
14	"Kerala"	0	20	9	0	14160	6372 ↙ 20532
15	"Madhya Pradesh"	36	4	0	25488	2832	0 ↙ 28320
16	"Maharashtra"	33	15	19	23364	10620	13452 ↙ 47436
17	"Manipur"	3	0	0	2124	0	0 ↙ 2124
18	"Meghalaya"	2	1	0	1416	708	0 ↙ 2124
19	"Mizoram"	2	0	0	1416	0	0 ↙ 1416

20	"Nagaland"	2	0	0	1416	0	0 ↙ 1416
21	"Odisha"	9	1	21	6372	708	14868 ↙ 21948
22	"Puducherry"	1	1	0	708	708	0 ↙ 1416
23	"Punjab"	4	11	4	2832	7788	2832 ↙ 13452
24	"Rajasthan"	31	3	1	21948	2124	708 ↙ 24780
25	"Sikkim"	2	0	0	1416	0	0 ↙ 1416
26	"Tamil Nadu"	8	45	4	5664	31860	2832 ↙ 40356
27	"Telangana"	4	3	16	2832	2124	11328 ↙ 16284
28	"Tripura"	2	0	1	1416	0	708 ↙ 2124
29	"Uttar Pradesh"	86	2	21	60888	1416	14868 ↙ 77172
30	"Uttarakhand"	7	1	0	4956	708	0 ↙ 5664
31	"West Bengal"	17	4	36	12036	2832	25488 ↙ 40356
32	"Remaining"	2	2	1	1416	1416	708 ↙ 3540
33	"Total"	442	144	178	3.1294e+05	1.0195e+05	1.2602e+05 ↙ 5.4091e+05

Table 3 - Percentage of Each States in Electoral College

Sr_No	State	Total_Votes_Each_States_in_Electoral_College	Percentage_of_Each_States_in_Electoral_College
1	"Andhra Pradesh"	53154	4.837
2	"Arunachal Pradesh"	2604	0.23696
3	"Assam"	29484	2.683
4	"Bihar"	80098	7.2889

5	"Chhattisgarh"	22809	2.0756
6	"Delhi"	11140	1.0137
7	"Goa"	2924	0.26608
8	"Gujarat"	52509	4.7783
9	"Haryana"	20700	1.8837
10	"Himachal Pradesh"	8424	0.76658
11	"Jammu & Kashmir"	4248	0.38657
12	"Jharkhand"	28416	2.5859
13	"Karnataka"	54832	4.9897
14	"Kerala"	41660	3.7911
15	"Madhya Pradesh"	58450	5.3189
16	"Maharashtra"	97661	8.8871
17	"Manipur"	3204	0.29156
18	"Meghalaya"	3144	0.2861
19	"Mizoram"	25808	2.3485
20	"Nagaland"	1956	0.178
21	"Odisha"	43851	3.9904
22	"Puducherry"	1896	0.17254
23	"Punjab"	27024	2.4592
24	"Rajasthan"	50580	4.6028
25	"Sikkim"	1640	0.14924
26	"Tamil Nadu"	81540	7.4201
27	"Telangana"	31992	2.9113
28	"Tripura"	3554	0.32341
29	"Uttar Pradesh"	1.61e+05	14.651
30	"Uttarakhand"	10144	0.9231
31	"West Bengal"	84448	7.6848
32	"Remaining"	3540	0.32214

The percentage of Electoral College voted are 98.51%

Table 4 - Total Electoral College Vote Share according to Party

Sr_No	Party	Available_Votes_of_each_party_in_Electoral_College	Percentage_of_each_party_in_Electoral_College
1	"BJP"	4.5938e+05	41.803
2	"INC"	1.4914e+05	13.572

3	"AITC"	47592	4.3309
4	"DMK"	46168	4.2013
5	"YSRCP"	43674	3.9743
6	"BJD"	31854	2.8987
7	"SP"	29233	2.6602
8	"SHS"	25551	2.3251
9	"TRS"	24924	2.2681
10	"JD(U)"	22061	2.0075
11	"CPI(M)"	17633	1.6046
12	"RJD"	16691	1.5189
13	"AAP"	16432	1.4953
14	"NCP"	16291	1.4825
15	"AIADMK"	15688	1.4276
16	"Vacant"	15221	1.3851
17	"IND"	10559	0.96087
18	"BSP"	10176	0.92601
19	"JMM"	6696	0.60933
20	"TDP"	6489	0.5905
21	"JD(S)"	5912	0.53799
22	"CPI"	5406	0.49195
23	"AD(S)"	3912	0.35599
24	"AIMIM"	3555	0.3235
25	"RLJP"	3540	0.32214
26	"SAD"	3180	0.28938
27	"AIUDF"	2448	0.22277
28	"IUML"	2284	0.20784
29	"KC(M)"	2176	0.19802
30	"JKNC"	2124	0.19328
31	"CPI(M-L)"	2076	0.18892
32	"NPP"	1965	0.17881
33	"RLD"	1793	0.16316
34	"AGP"	1752	0.15943
35	"NPF"	1731	0.15752
36	"MNF"	1640	0.14924
37	"PMK"	1588	0.14451
38	"MDMK"	1412	0.12849
39	"VCK"	1412	0.12849
40	"NISHAD"	1248	0.11357
41	"SBSP"	1248	0.11357

42	"JJP"	1120	0.10192
43	"RLP"	1095	0.099645
44	"AJSU"	940	0.08554
45	"NDPP"	897	0.081627
46	"RSP"	883	0.080353
47	"LJD"	860	0.07826
48	"SKM"	841	0.076531
49	"UPPL"	812	0.073892
50	"SDF"	715	0.065065
51	"AGM"	708	0.064428
52	"LJP(RV)"	708	0.064428
53	"RPI(A)"	708	0.064428
54	"SAD(S)"	708	0.064428
55	"TMC(M)"	708	0.064428
56	"HAM"	692	0.062972
57	"BTP"	552	0.050232
58	"BVA"	525	0.047775
59	"VIP"	519	0.047229
60	"JSD(L)"	416	0.037856
61	"JCC"	387	0.035217
62	"MMK"	352	0.032032
63	"PJP"	350	0.03185
64	"BPF"	348	0.031668
65	"KC"	304	0.027664
66	"IPFT"	182	0.016562
67	"CPI(ML)L"	176	0.016016
68	"KMDK"	176	0.016016
69	"PBK"	176	0.016016
70	"TVK"	176	0.016016
71	"JSS"	175	0.015925
72	"MNS"	175	0.015925
73	"PWPI"	175	0.015925
74	"SWP"	175	0.015925
75	"AINRC"	160	0.01456
76	"JSP"	159	0.014469
77	"C(S)"	152	0.013832
78	"INL"	152	0.013832
79	"JKC"	152	0.013832
80	"KC(B)"	152	0.013832

81	"KC(J)"	152	0.013832
82	"NCK"	152	0.013832
83	"NSC"	152	0.013832
84	"RMPI"	152	0.013832
85	"GJM"	151	0.013741
86	"ISF"	151	0.013741
87	"UDP"	136	0.012376
88	"RD"	116	0.010556
89	"HLP"	112	0.010192
90	"INLD"	112	0.010192
91	"PDF"	68	0.006188
92	"ZPM"	48	0.004368
93	"MGP"	40	0.00364
94	"KPA"	36	0.003276
95	"HSPDP"	34	0.003094
96	"GFP"	20	0.00182
97	"RGP"	20	0.00182
98	"KHNAM"	17	0.001547

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