

Presidential Election Data Analysis Using SAS 2008 –2016

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Final Project ACM 614

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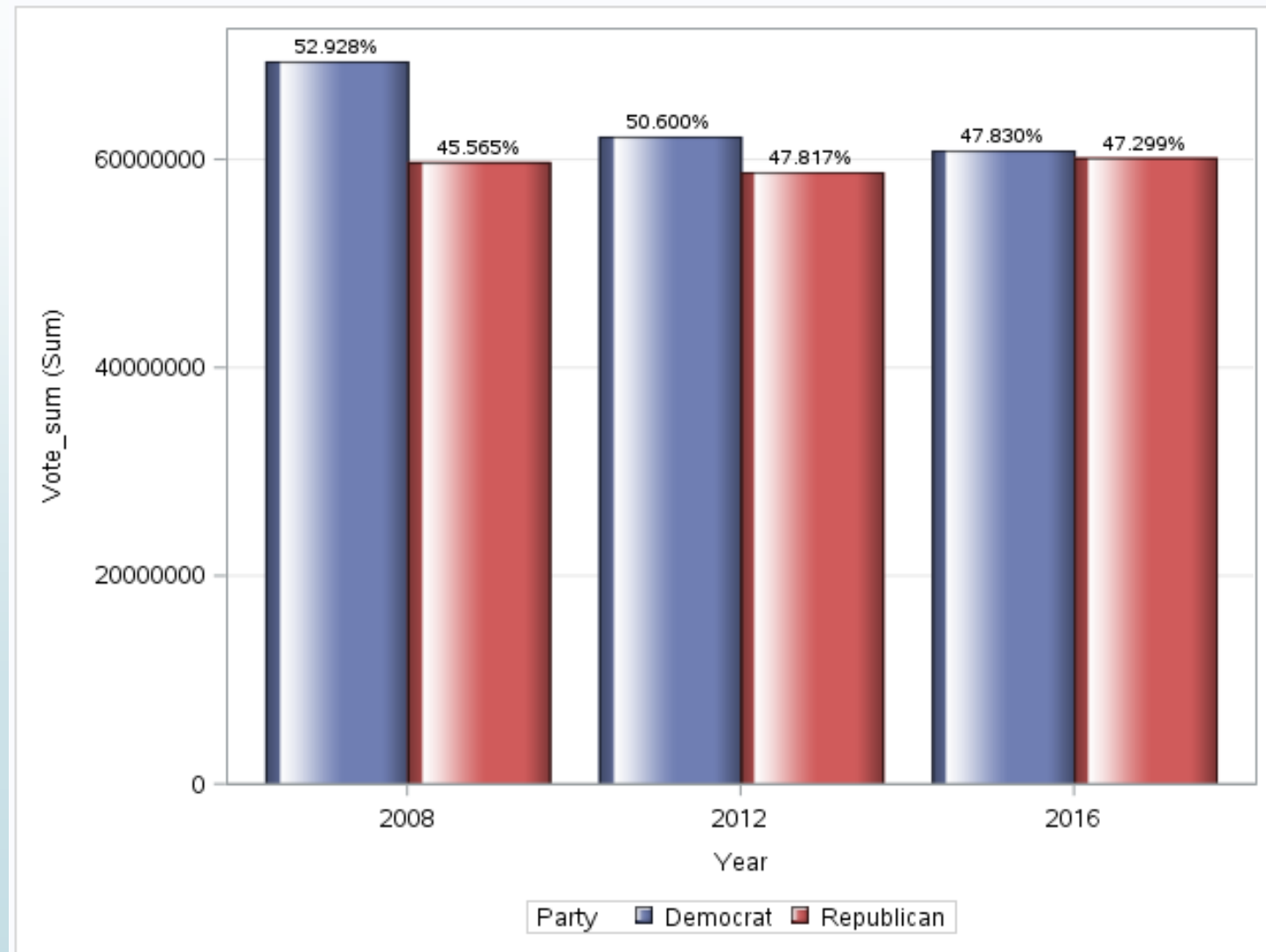
The Change of Voting Trends between 2008 - 2016

The MEANS Procedure

Variable	Label	Sum
dem_2008	dem_2008	69432607.00
gop_2008	gop_2008	59773838.00
oth_2008	oth_2008	1828712.00
total_2008	total_2008	131183095
dem_2012	dem_2012	62209008.00
gop_2012	gop_2012	58786901.00
oth_2012	oth_2012	1945404.00
total_2012	total_2012	122941313
dem_2016	dem_2016	60873946.00
gop_2016	gop_2016	60197788.00
oth_2016	oth_2016	6197593.00
total_2016	total_2016	127269327

The MEANS Procedure

Variable	Maximum	Minimum
dem_12_8	40945.00	-623689.00
dem_16_12	121020.00	-100567.00
gop_12_8	45932.00	-256825.00
gop_16_12	69055.00	-170324.00
total_12_8	84560.00	-890379.00
total_16_12	138825.00	-191109.00



Frequency of Lead Counties by Party

The FREQ Procedure

Win2008	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Democrat	875	28.12	875	28.12
Republican	2237	71.88	3112	100.00

Win2012	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Democrat	686	22.04	686	22.04
Republican	2426	77.96	3112	100.00

Win2016	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Democrat	487	15.65	487	15.65
Republican	2625	84.35	3112	100.00

```
data sa_hm.el2;
set sa_hm.E_difference;
if dem_2008>gop_2008 then Win2008 = "Democrat";
if dem_2008<gop_2008 then Win2008 = "Republican";
if dem_2012>gop_2012 then Win2012 = "Democrat";
if dem_2012<gop_2012 then Win2012 = "Republican";
if dem_2016>gop_2016 then Win2016 = "Democrat";
if dem_2016<gop_2016 then Win2016 = "Republican";
run;
```

```
proc freq data=sa_hm.el2;
table Win2008 Win2012 Win2016;
run;
```

```
/*2008 all democratic won county sum*/
proc sql;
create table sa_hm.el3 as
select sum(dem_2008) as sum_de8
from sa_hm.el2
where dem_2008>gop_2008;
quit;
run;
```

Total number of votes the counties (875) which have higher votes for democratic in 2008

Obs	sum_de8
1	50101583

Total number of votes the counties (2237) which have higher votes for Republican in 2008

Obs	sum_re8
1	29850269

The difference = 50101583-29850269 = 20251314

Top 15 States Lead by Democrats and Republicans 2008

Democrats' Top 15 (Won 28 State + DC) Republicans' Top 15 (Won 21 State)

```
proc sql;
  create table sa_hm.el5 as
  select distinct State_Code, State, sum(dem_2008) as dem_2008, sum(gop_2008) as gop_2008
  from sa_hm.el2
  group by State;
```

```
quit;
run;
```

```
proc sort data=sa_hm.el5 out=sa_hm.el6;
  by descending gop_2008;
run;
```

```
data sa_hm.el7;
  set sa_hm.el6;
  if gop_2008 > dem_2008;
run;
```

```
proc print data=sa_hm.el7;
run;
```

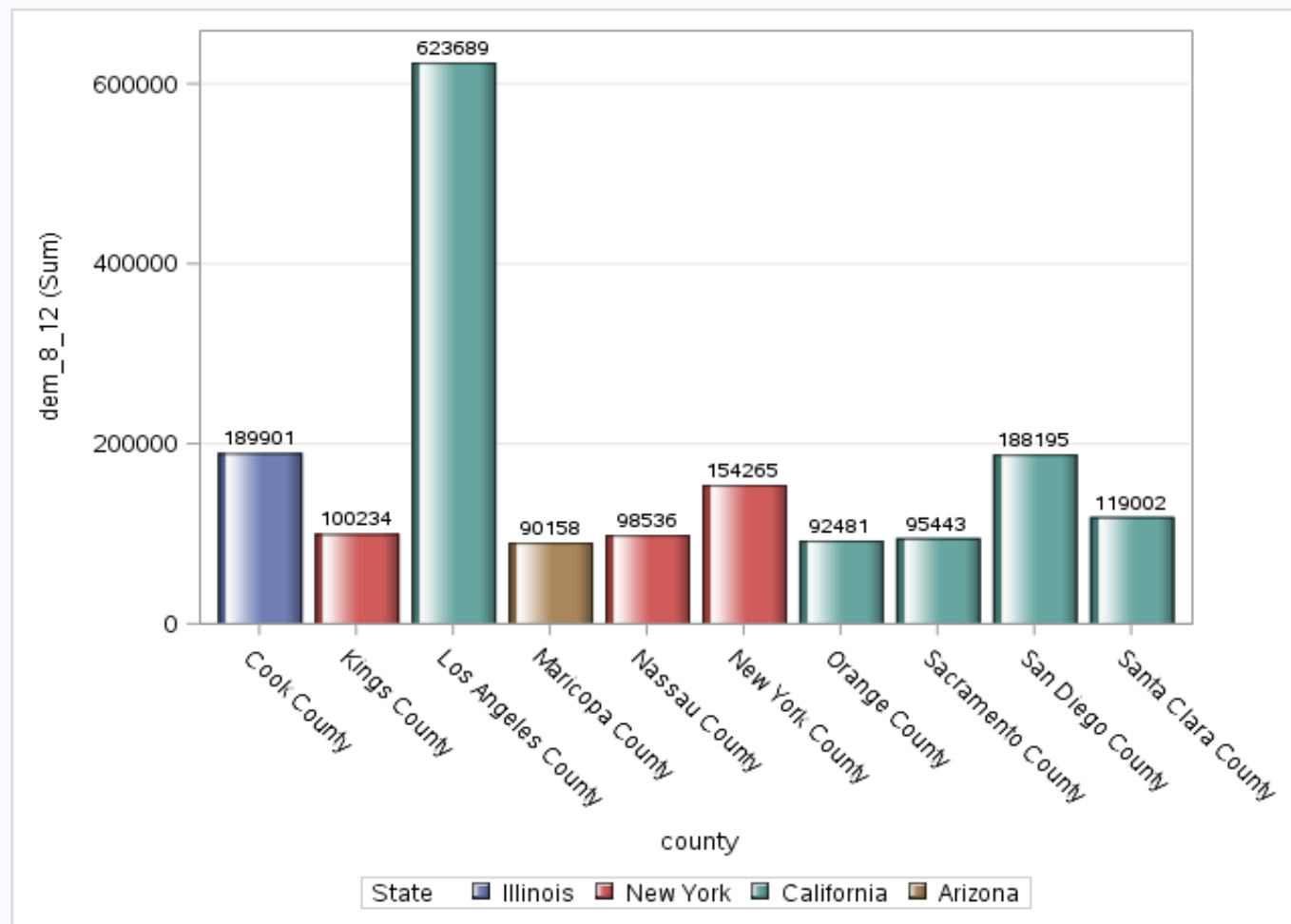
Obs	State	dem_2008	gop_2008
1	California	8274473	5011781
2	New York	4804701	2752728
3	Florida	4282074	4045624
4	Illinois	3419348	2031179
5	Pennsylvania	3276363	2655885
6	Ohio	2923149	2675009
7	Michigan	2872579	2048639
8	New Jersey	2215422	1613207
9	North Carolina	2142651	2128474
10	Virginia	1958261	1723508
11	Massachusetts	1904097	1108854
12	Washington	1750848	1229216
13	Wisconsin	1676761	1262393
14	Maryland	1629467	959862
15	Minnesota	1573354	1275409

Obs	State	dem_2008	gop_2008
1	Texas	3528633	4479328
2	Georgia	1844123	2048759
3	Tennessee	1087437	1479178
4	Missouri	1441947	1445814
5	Alabama	813479	1268546
6	Arizona	1034707	1230111
7	Louisiana	782989	1148275
8	Kentucky	751985	1048462
9	South Carolina	862449	1034896
10	Oklahoma	502496	960165
11	Mississippi	554662	724597
12	Kansas	514765	699655
13	Arkansas	422310	638017
14	Utah	327670	598030
15	Nebraska	333319	452979

Top Ten Counties

Democrats' Largest Voting Change (2008 – 2012)

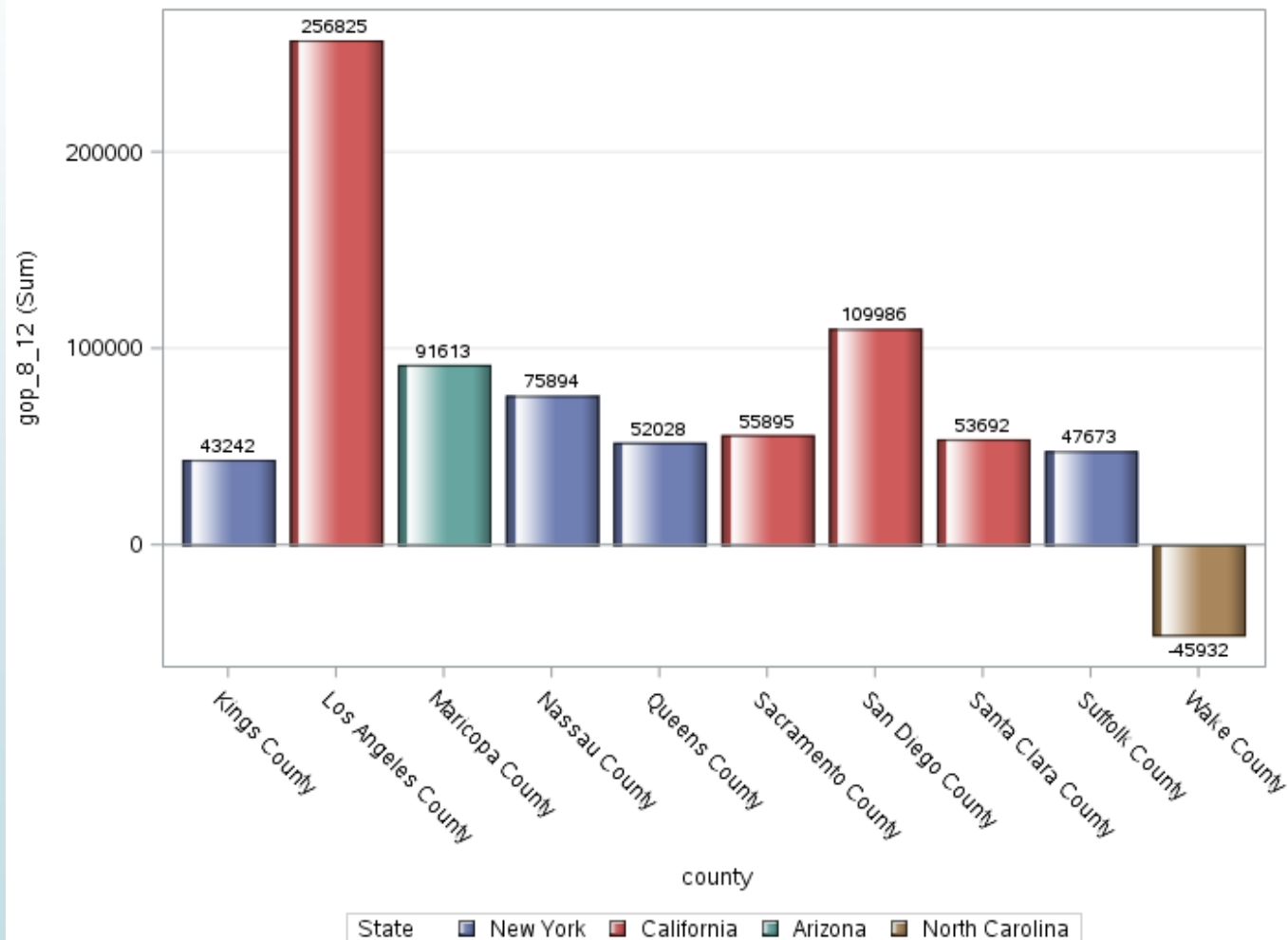
Obs	county	State	dem_8_12	gop_8_12
1	Maricopa County	Arizona	90158	91613
2	Los Angeles County	California	623689	256825
3	Orange County	California	92481	37472
4	Sacramento County	California	95443	55895
5	San Diego County	California	188195	109986
6	Santa Clara County	California	119002	53692
7	Cook County	Illinois	189901	8532
8	Kings County	New York	100234	43242
9	Nassau County	New York	98536	75894
10	New York County	New York	154265	17606



Top Ten Counties

Republicans' Largest Voting Change (2008 – 2012)

Obs	county	State	gop_8_12	dem_8_12
1	Los Angeles County	California	256825	623689
2	San Diego County	California	109986	188195
3	Maricopa County	Arizona	91613	90158
4	Nassau County	New York	75894	98536
5	Sacramento County	California	55895	95443
6	Santa Clara County	California	53692	119002
7	Queens County	New York	52028	80722
8	Suffolk County	New York	47673	71719
9	Kings County	New York	43242	100234
10	Wake County	North Carolina	-45932	-36048

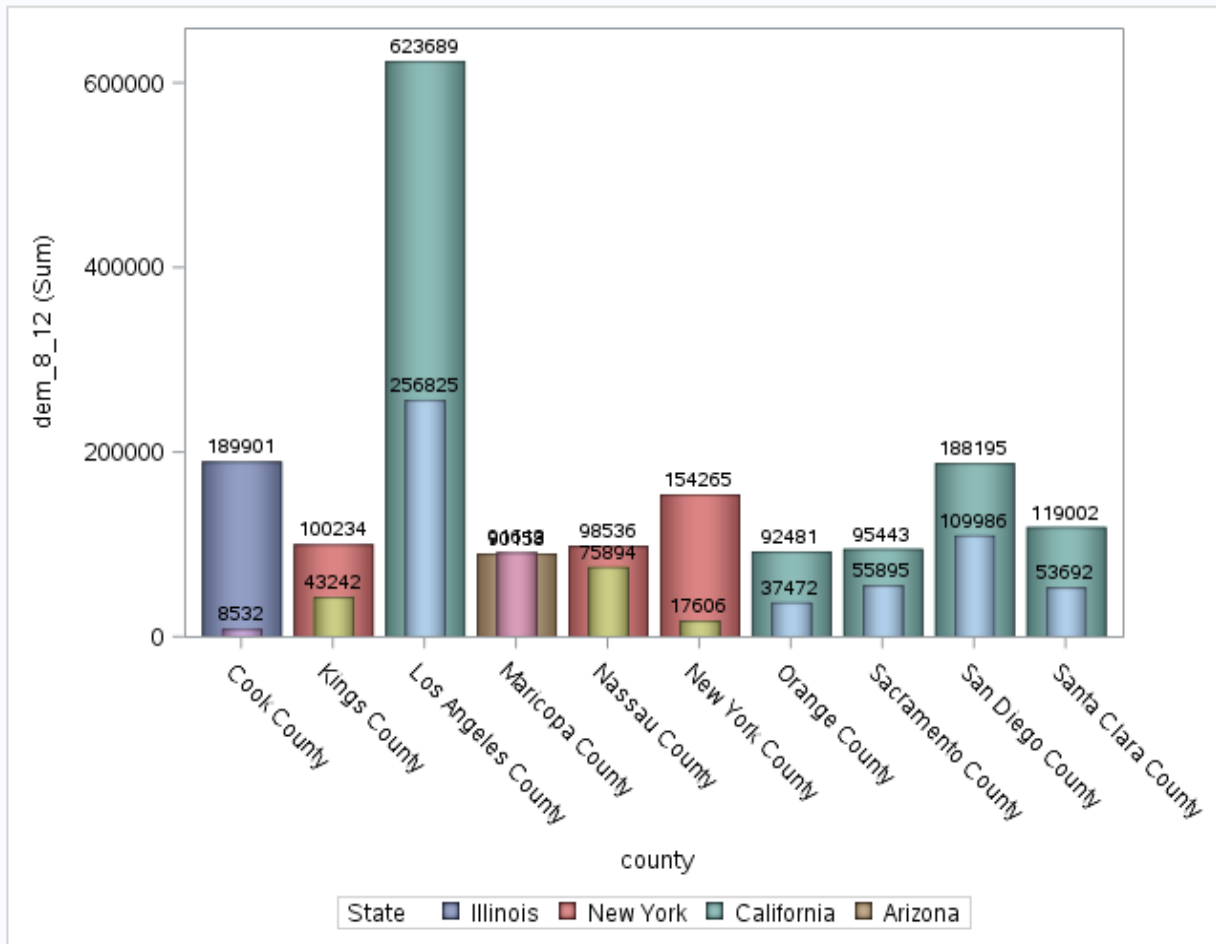


```
proc sgplot data=sa_hm.largest_change_R12;
    vbar county/ response=gop_8_12 group=State groupdisplay=cluster
        datalabel datalabelattrs = (weight = bold) dataskin=gloss; yaxis grid;
run;
```

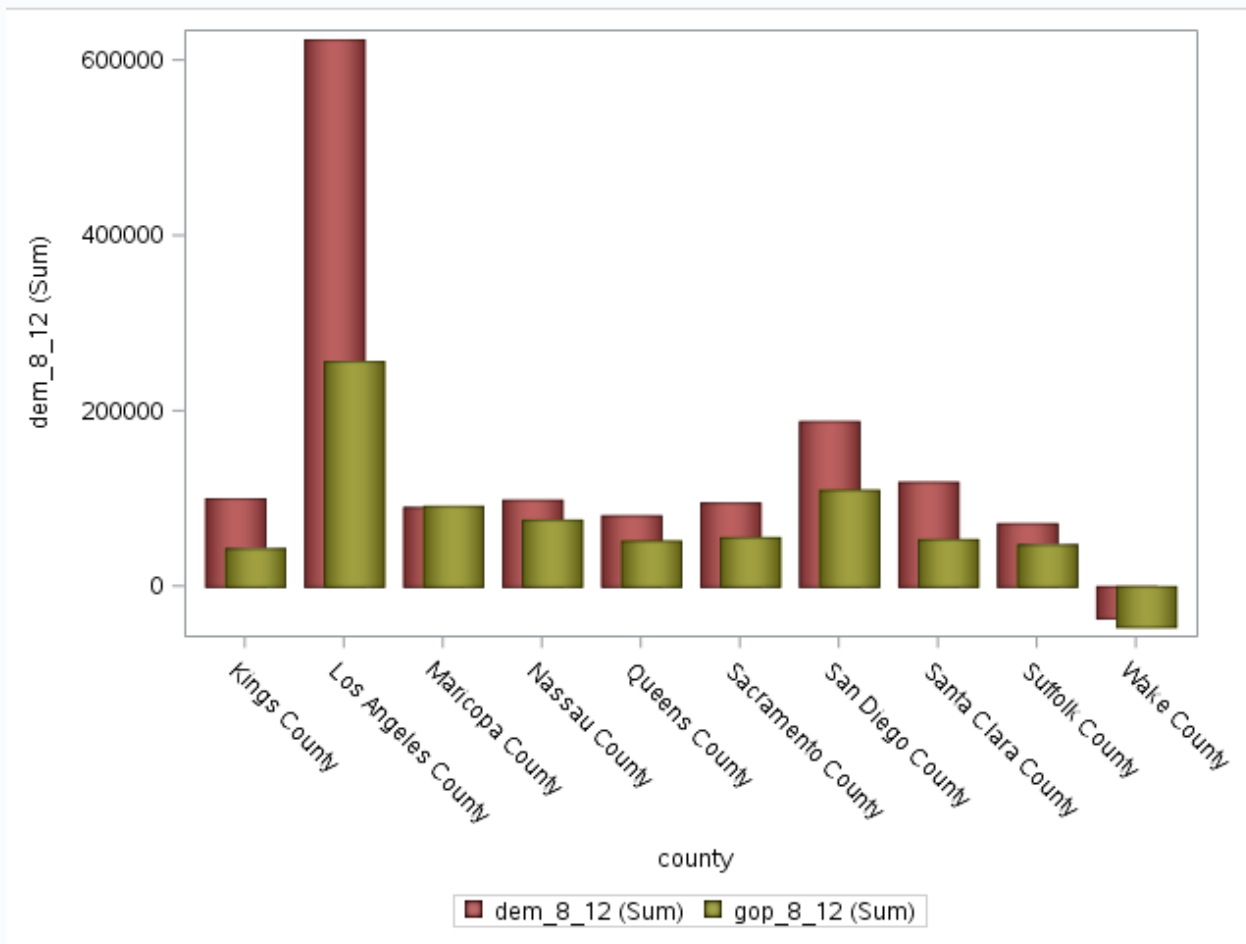
Democrats' and Republicans' Largest Voting Change (2008 – 2012) Counties Comparison

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Democrats' Top 10



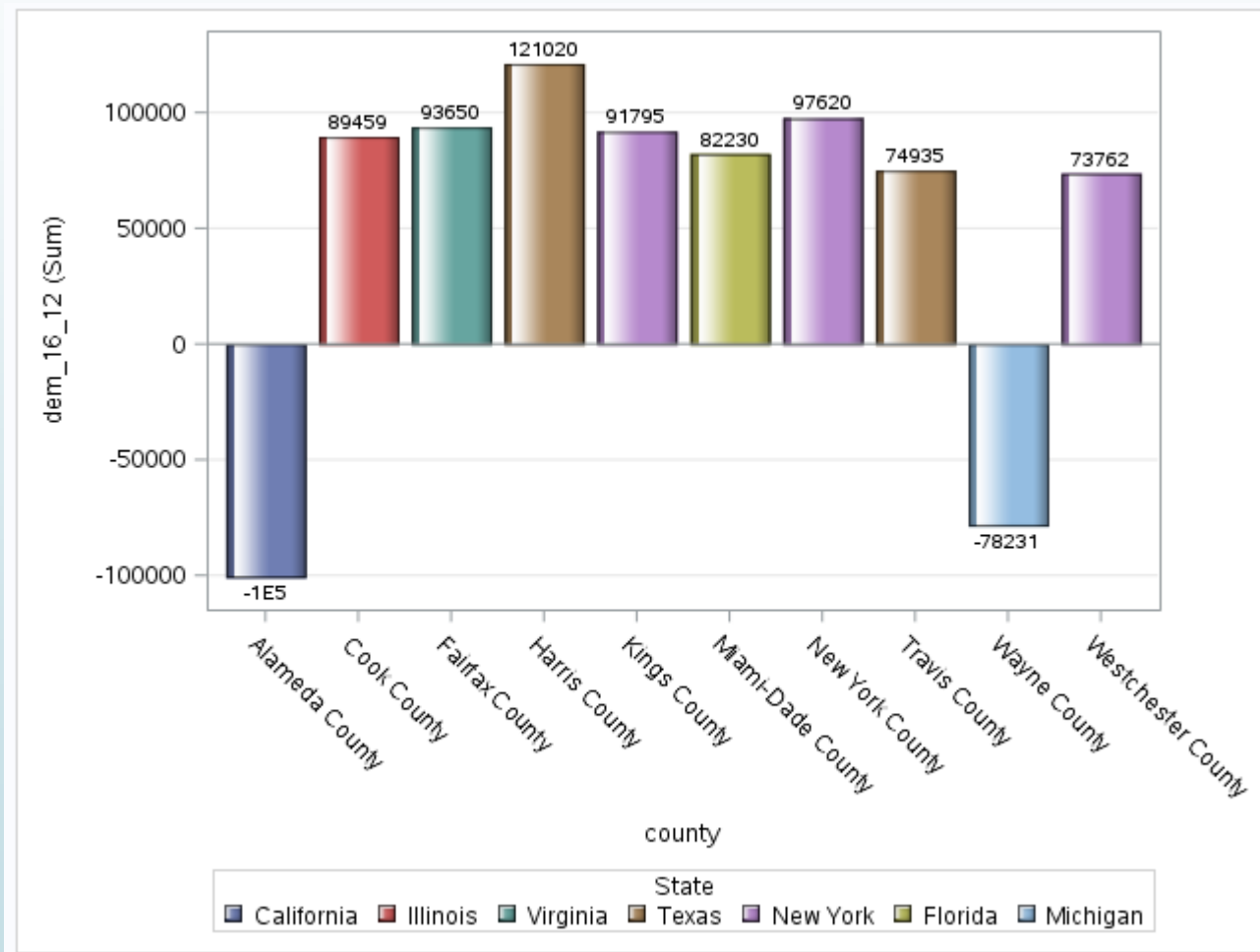
Republicans' Top 10



Top Ten Counties

Democrats' Largest Voting Change (2016 – 2012)

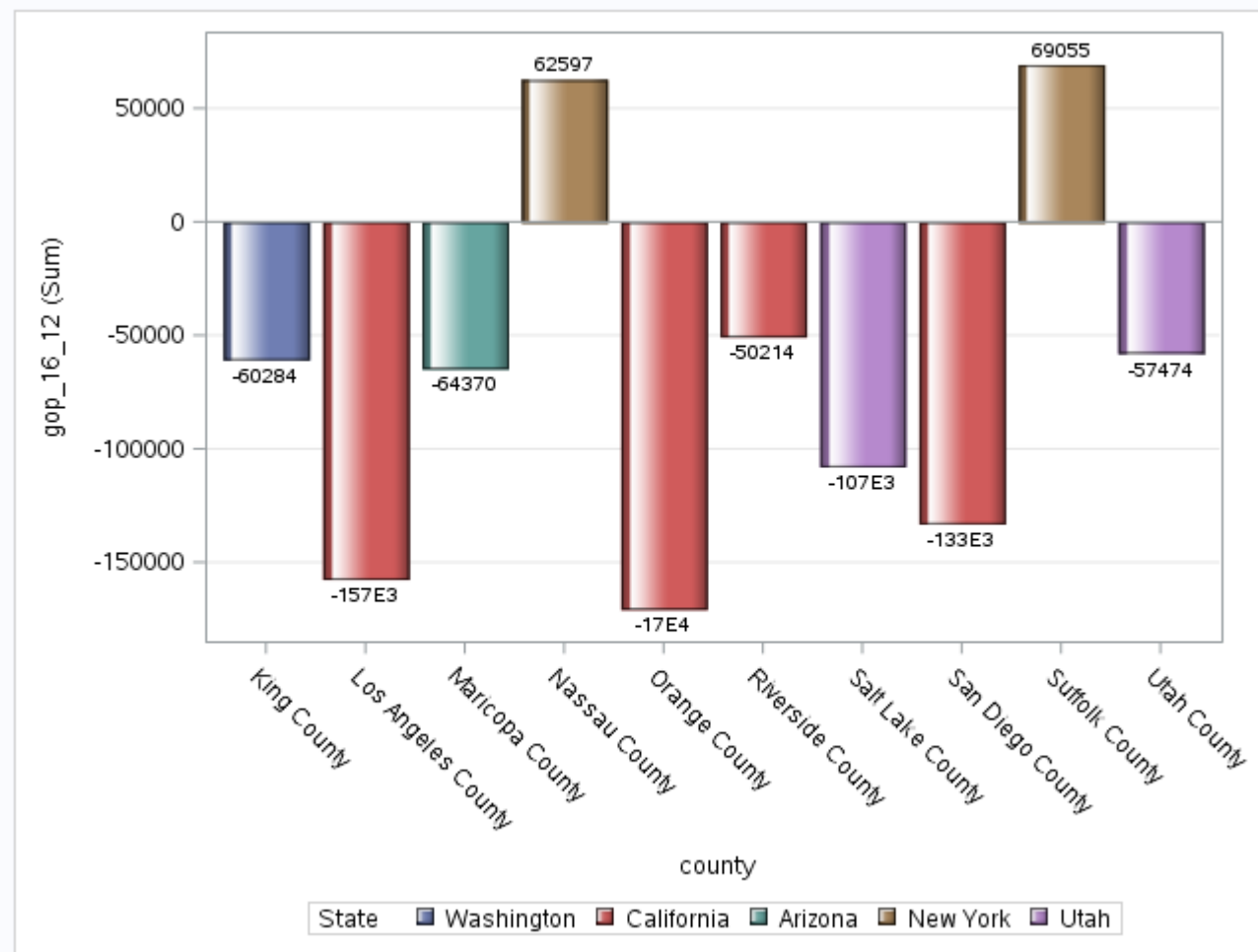
Obs	State	county	dem_16_12	gop_16_12
1	California	Alameda County	-100587	-40320
2	Florida	Miami-Dade County	82230	1064
3	Illinois	Cook County	89459	-38991
4	Michigan	Wayne County	-78231	14727
5	New York	Kings County	91795	25023
6	New York	New York County	97620	-13365
7	New York	Westchester County	73762	12936
8	Texas	Harris County	121020	-39906
9	Texas	Travis County	74935	-12753
10	Virginia	Fairfax County	93650	-15949



Top Ten Counties

Republicans' Largest Voting Change (2016 – 2012)

Obs	State	county	dem_16_12	gop_16_12
1	Arizona	Maricopa County	37032	-64370
2	California	Los Angeles County	-17538	-157009
3	California	Orange County	-43095	-170324
4	California	Riverside County	-34539	-50214
5	California	San Diego County	-49048	-132525
6	New York	Nassau County	63677	62597
7	New York	Suffolk County	2123	69055
8	Utah	Salt Lake County	-5984	-107364
9	Utah	Utah County	7143	-57474
10	Washington	King County	38237	-60284



```
proc sgplot data=sashelp.large_change_D12;
  vbar county / response=gop_16_12 group=State groupdisplay=cluster
    datalabel datalabelattrs=(weight=bold) dataskin=gloss; yaxis grid;
run;
```

15 Counties with Highest Number of Voting Community in USA

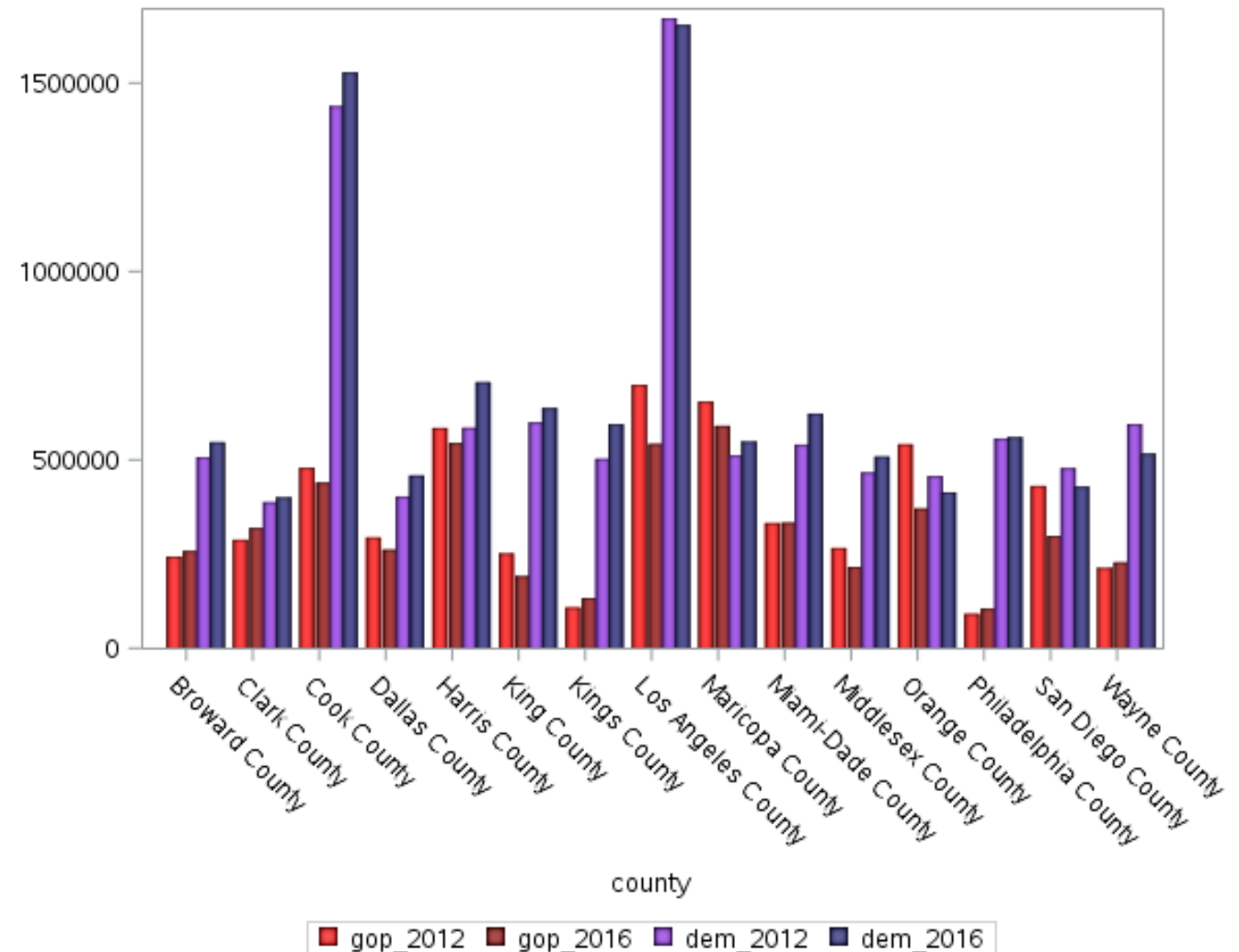
Obs	State	county	dem_2012	dem_2016	gop_2012	gop_2016
1	California	Los Angeles County	1672164	1654626	699600	542591
2	Illinois	Cook County	1439123	1528582	479204	440213
3	Texas	Harris County	585451	706471	584866	544960
4	Washington	King County	599796	638033	252090	191806
5	Florida	Miami-Dade County	540776	623006	332602	333666
6	New York	Kings County	503291	595086	108630	133653
7	Pennsylvania	Philadelphia County	557024	560542	91840	105418
8	Arizona	Maricopa County	512008	549040	654835	590465
9	Florida	Broward County	507430	546956	243732	258521
10	Michigan	Wayne County	595253	517022	213586	228313
11	Massachusetts	Middlesex County	467173	508919	266307	216163
12	Texas	Dallas County	403170	458845	294339	261865
13	California	San Diego County	478386	429338	431046	298521
14	California	Orange County	457077	413982	541592	371268
15	Nevada	Clark County	387978	401068	288223	319571

```

proc sql;
create table ll as
select county, dem_2012, dem_2016, gop_2012, gop_2016
from sa_hm.e12
where total_2016 > 680000;
quit;

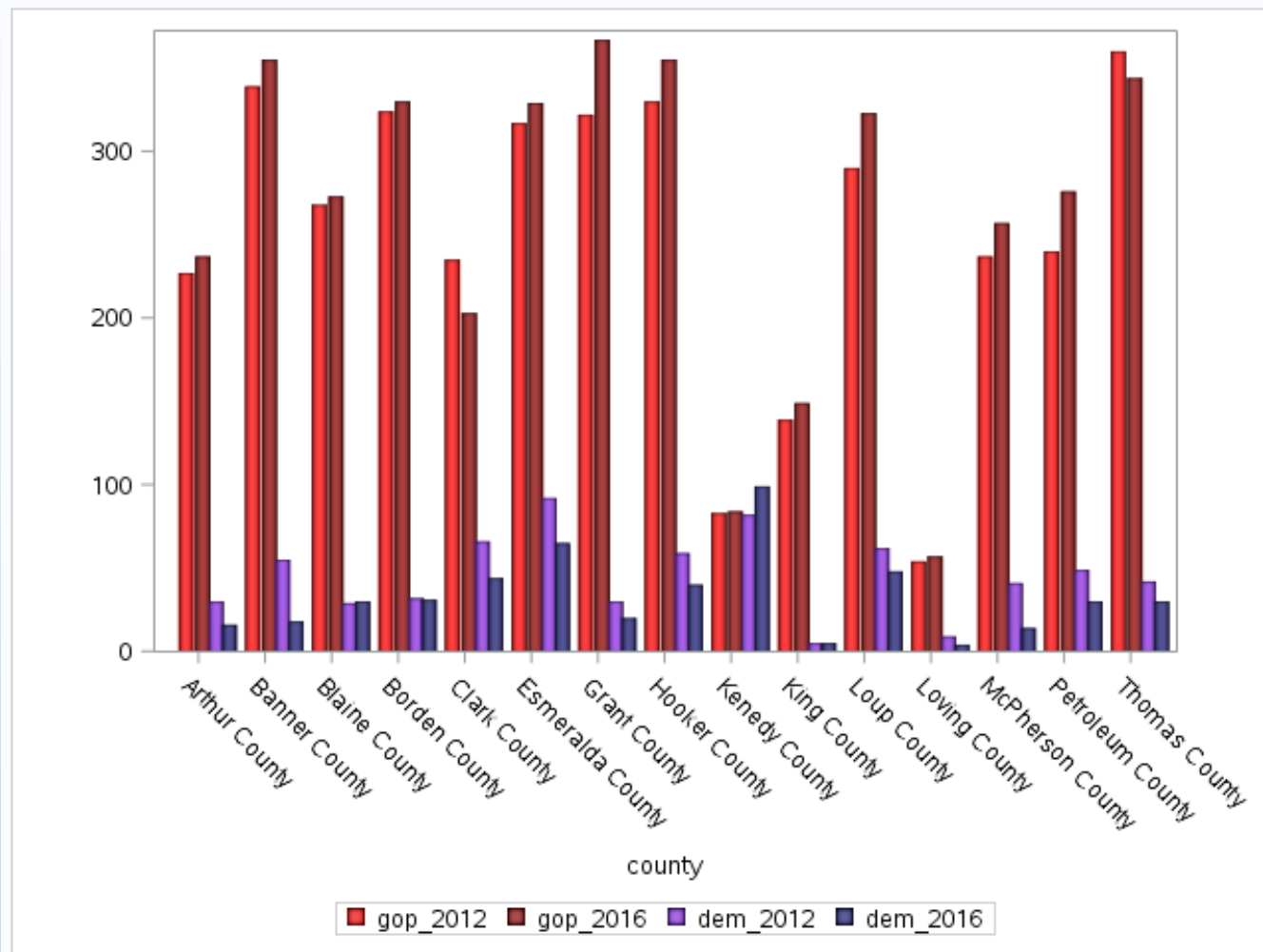
proc sgplot data=ll;
styleattrs datacolors=(red cx8B0000 blueviolet cx191970 );
vbar county/ response=gop_2012
dataskin=presse barwidth=0.2 baselineattrs=(thickness=0) discreteoffset=-0.2;
vbar county/ response=gop_2016
dataskin=presse barwidth=0.2 baselineattrs=(thickness=0) discreteoffset=0.05 ;
vbar county/ response=dem_2012
dataskin=presse barwidth=0.2 baselineattrs=(thickness=0) discreteoffset=0.25 ;
vbar county/ response=dem_2016
dataskin=presse barwidth=0.2 baselineattrs=(thickness=0) discreteoffset=0.45 ;
run;

```



Counties with Lowest Number of Voting Community in USA

Obs	State	county	dem_2012	dem_2016	gop_2012	gop_2016
1	Texas	Loving County	9	4	54	57
2	Texas	Kenedy County	82	99	83	84
3	Texas	King County	5	5	139	149
4	South Dakota	Buffalo County	472	296	166	171
5	Idaho	Clark County	66	44	235	203
6	Nebraska	Arthur County	30	16	227	237
7	Nebraska	McPherson County	41	14	237	257
8	Nebraska	Blaine County	29	30	268	273
9	Montana	Petroleum County	49	30	240	276
10	Texas	Terrell County	184	140	358	287
11	Nebraska	Loup County	62	48	290	323
12	Utah	Daggett County	91	76	399	327
13	Nevada	Esmeralda County	92	65	317	329
14	Texas	Borden County	32	31	324	330
15	Nebraska	Thomas County	42	30	360	344
16	Montana	Treasure County	114	59	317	350
17	Nebraska	Banner County	55	18	339	355
18	Nebraska	Hooker County	59	40	330	355
19	Texas	Kent County	66	59	334	360
20	North Dakota	Slope County	83	42	341	361
21	Montana	Golden Valley County	110	71	351	365
22	Nebraska	Grant County	30	20	322	367
23	Nebraska	Wheeler County	93	62	345	377
24	Nebraska	Logan County	68	32	356	400
25	Texas	McMullen County	67	40	436	454



The Counties which Keep Increasing Republicans' Vote in Largest Scale 2008-2016

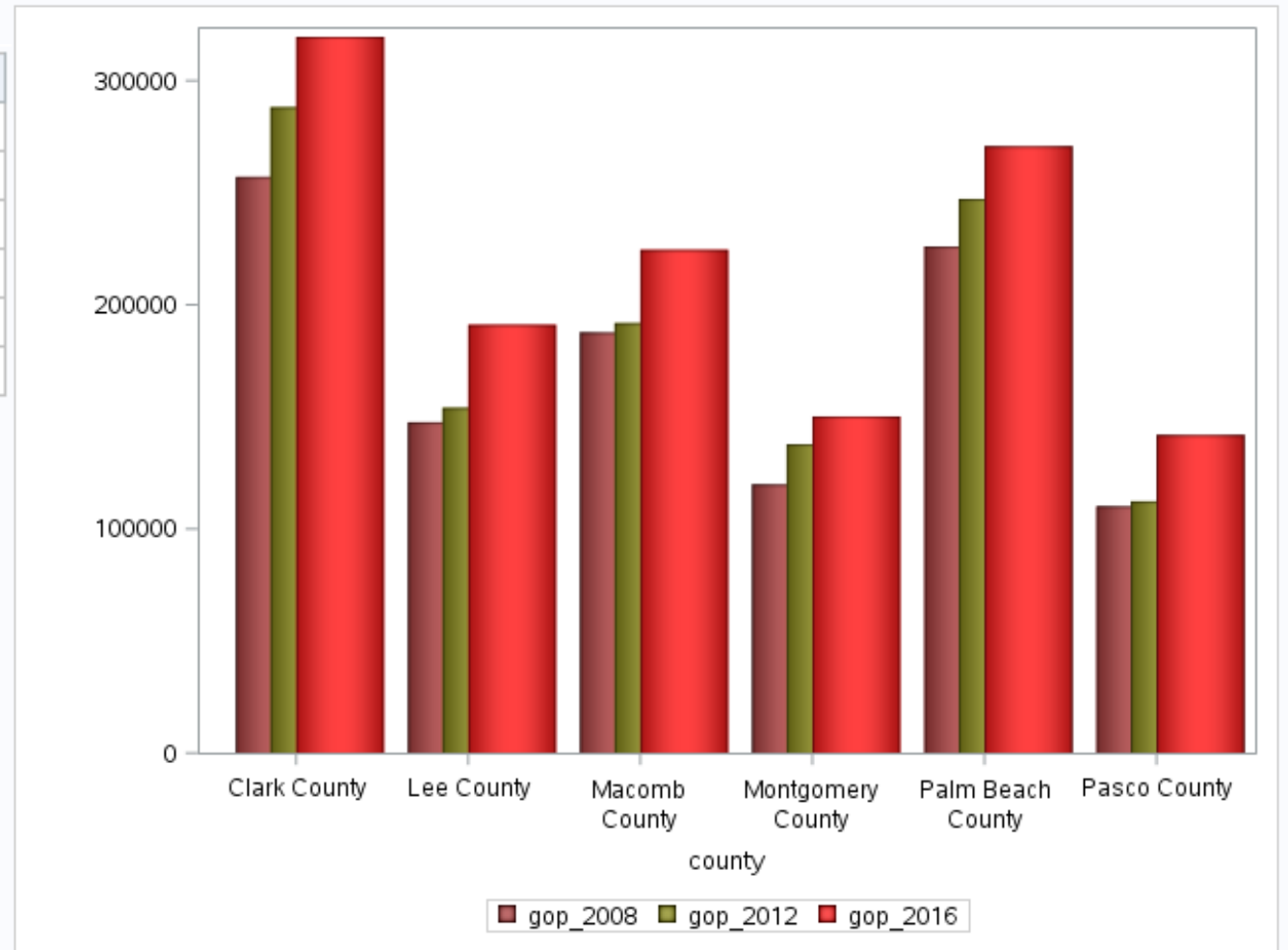
1552 counties keep increasing Republican's vote from 2008 to 2016

State	county	gop_2008	gop_2012	gop_2016	total_increase
Florida	Lee County	147608	154112	191141	43533
Florida	Palm Beach County	226037	247257	270762	44725
Florida	Pasco County	110104	112335	141943	31839
Michigan	Macomb County	187663	191896	224589	36926
Nevada	Clark County	257078	288223	319571	62493
Texas	Montgomery County	119884	137822	150188	30304

```
proc sql;
  create table sa_hm.ele1 as
  select *, ((gop_2012-gop_2008)+(gop_2016-gop_2012)) as total_increase
  from sa_hm.ele2
  where (gop_2008<gop_2012)and (gop_2012<gop_2016);
quit;
run;
```

```
proc sql;
  create table sa_hm.ele2 as
  select *
  from sa_hm.ele1
  where total_increase>30000;
quit;
run;
```

```
proc sgplot data=sa_hm.ele2;
  styleattrs datacolors=(brown olive red);
  vbar county/ response=gop_2008
    dataskin=presse barwidth=0.5 baselineattrs=(thickness=0) discreteoffset=-0.1;
  vbar county/ response=gop_2012
    dataskin=presse barwidth=0.5 baselineattrs=(thickness=0) discreteoffset=0.1;
  vbar county/ response=gop_2016
    dataskin=presse barwidth=0.5 baselineattrs=(thickness=0) discreteoffset=0.25;
  /*done*/
run;
```



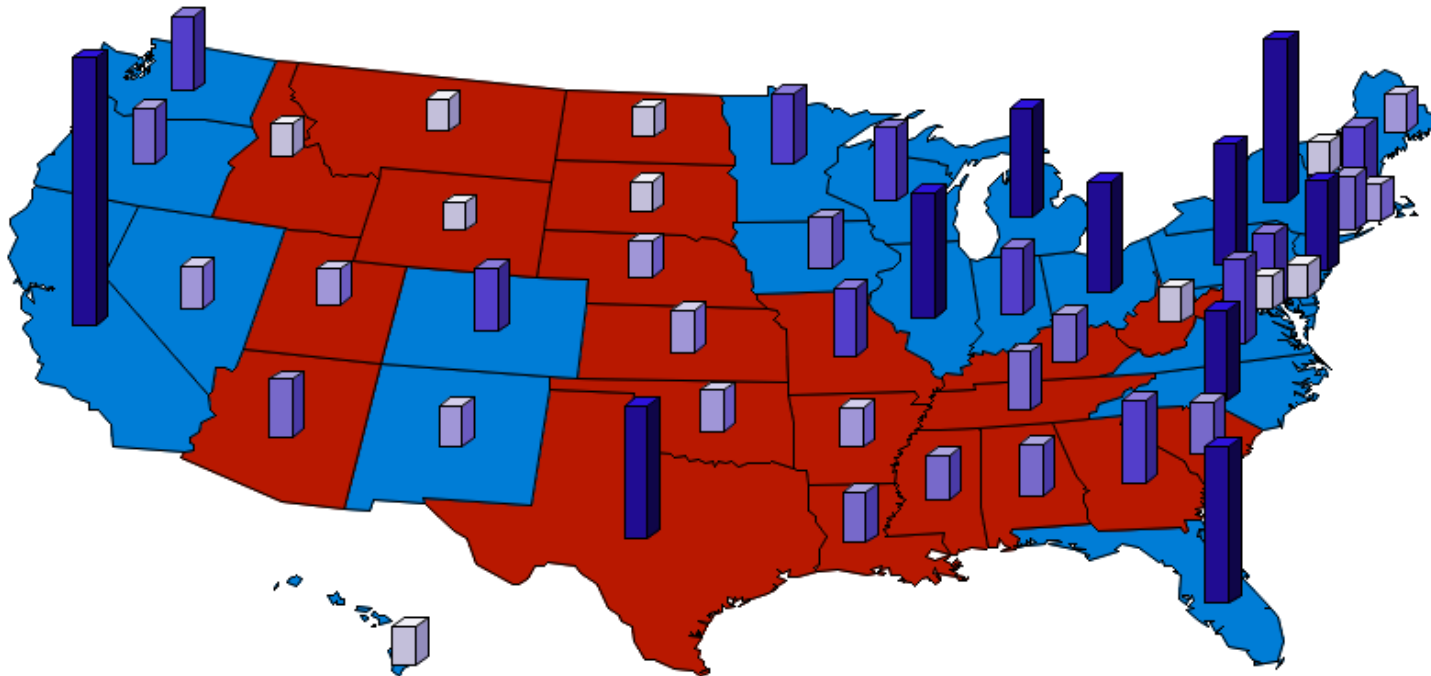
The Counties which Keep Decreasing Democrats' Vote in Largest Scale 2016-2008

2448 counties keep decreasing Democrat's vote from 2008 to 2016

Obs	State	county	dem_2008	dem_2012	dem_2016	total_decrease	Win2008	Win2012	Win2016
1	California	Los Angeles County	2295853	1672164	1654626	-641227	Democrat	Democrat	Democrat
2	California	San Diego County	666581	478386	429338	-237243	Democrat	Democrat	Democrat
3	California	Alameda County	489106	438091	337524	-151582	Democrat	Democrat	Democrat
4	Michigan	Wayne County	660085	595253	517022	-143063	Democrat	Democrat	Democrat
5	California	Orange County	549558	457077	413982	-135576	Republic	Republic	Democrat
6	California	Sacramento County	316506	221063	217211	-99295	Democrat	Democrat	Democrat
7	California	San Francisco County	322220	267857	238772	-83448	Democrat	Democrat	Democrat
8	Rhode Island	Washington County	116156	34904	33511	-82645	Democrat	Democrat	Democrat
9	Ohio	Cuyahoga County	458422	420953	383974	-74448	Democrat	Democrat	Democrat
10	California	Riverside County	325017	287754	253215	-71802	Democrat	Republic	Democrat
11	New York	Erie County	256299	220184	192065	-64234	Democrat	Democrat	Democrat
12	California	San Bernardino County	315720	274203	258409	-57311	Democrat	Democrat	Democrat
13	California	Sonoma County	168888	124504	116027	-52861	Democrat	Democrat	Democrat
14	Missouri	Saint Louis County	333123	294735	280866	-52257	Democrat	Democrat	Democrat
15	Utah	Salt Lake County	176988	132686	126702	-50286	Democrat	Republic	Democrat

Democrats Won State vs Republicans Won State With Democrats Vote-2008

Using the AREA and BLOCK statements with PROC GMAP



Democrats votes in 2008 election

82,868 - 325,201

1,288,576 - 1,958,261

1 Republican 2 Democrats

327,670 - 533,736

2,142,651 - 8,274,473

1 2

554,662 - 1,087,437

```
legend2 label=('Democrats votes in 2008 election ');
legend1 label=('1 Republican 2 Democrats');
```

```
/* Map area patterns */
```

```
pattern1 v=ms c=cxb81800;
```

```
pattern2 v=ms c=cx007dd6;
```

```
/* Block patterns */
```

```
pattern8 v=s c=cxC3BFDA;
```

```
pattern9 v=s c=cxA096D7;
```

```
pattern10 v=s c=cx7769CA;
```

```
pattern11 v=s c=cx533ECA;
```

```
pattern12 v=s c=cx200C92;
```

```
proc gmap data=trail map=mapsgfk.us;
```

```
id state;
```

```
area win_2008 / levels=2 legend=legend1;
```

```
block dem_2008 / levels=5 legend=legend2;
```

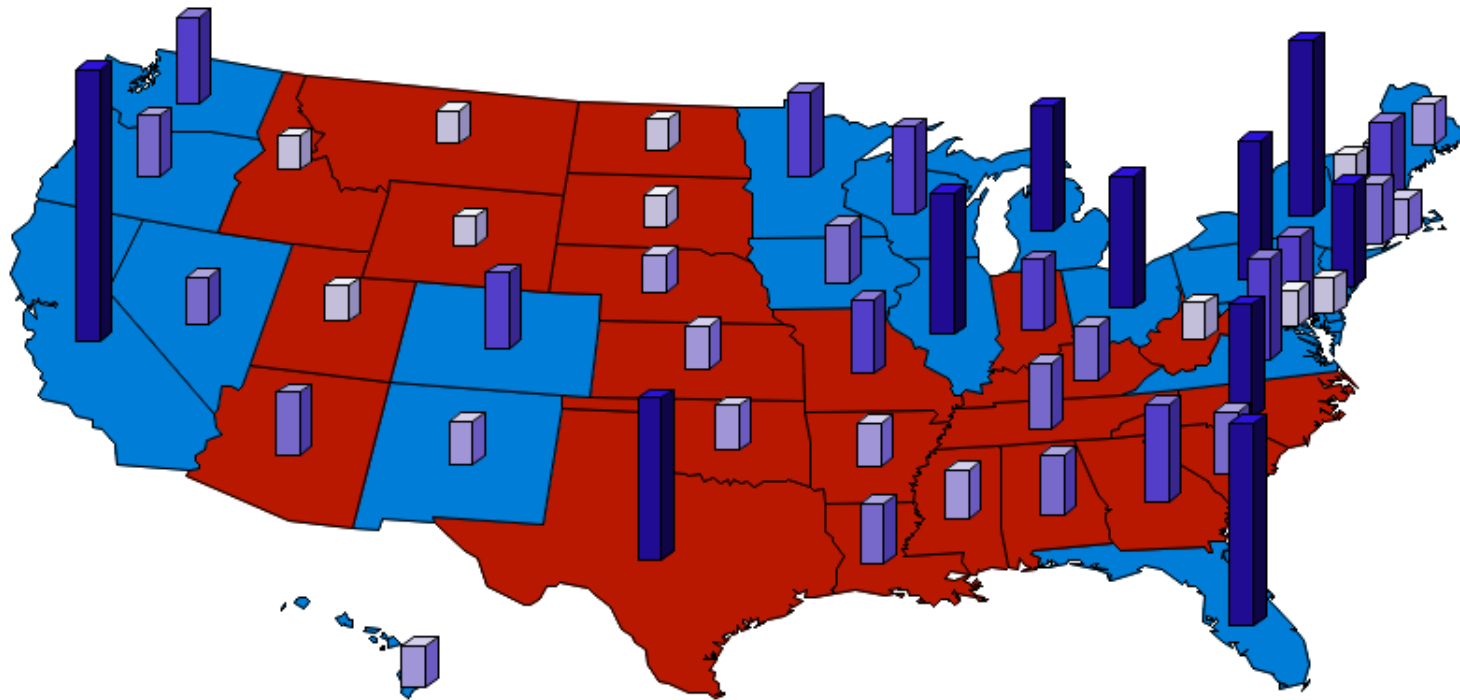
```
format win_2008 dem_2008 comma12.;
```

```
run;
```

```
quit;
```

Democrats Won State vs Republicans Won State With Democrats Vote-2012

Using the AREA and BLOCK statements with PROC GMAP



Democrats votes in 2012 election

68,780 - 242,547

1,140,425 - 1,904,303

274,342 - 528,260

1,960,744 - 6,241,648

528,801 - 953,043

1 Republican 2 Democrats

1 2

```
legend2 label=('Democrats votes in 2012 election ');
legend1 label=('1 Republican 2 Democrats');
```

```
/* Map area patterns */
```

```
pattern1 v=ms c=cxb81800;
```

```
pattern2 v=ms c=cx007dd6;
```

```
/* Block patterns */
```

```
pattern8 v=s c=cxC3BFDA;
```

```
pattern9 v=s c=cxA096D7;
```

```
pattern10 v=s c=cx7769CA;
```

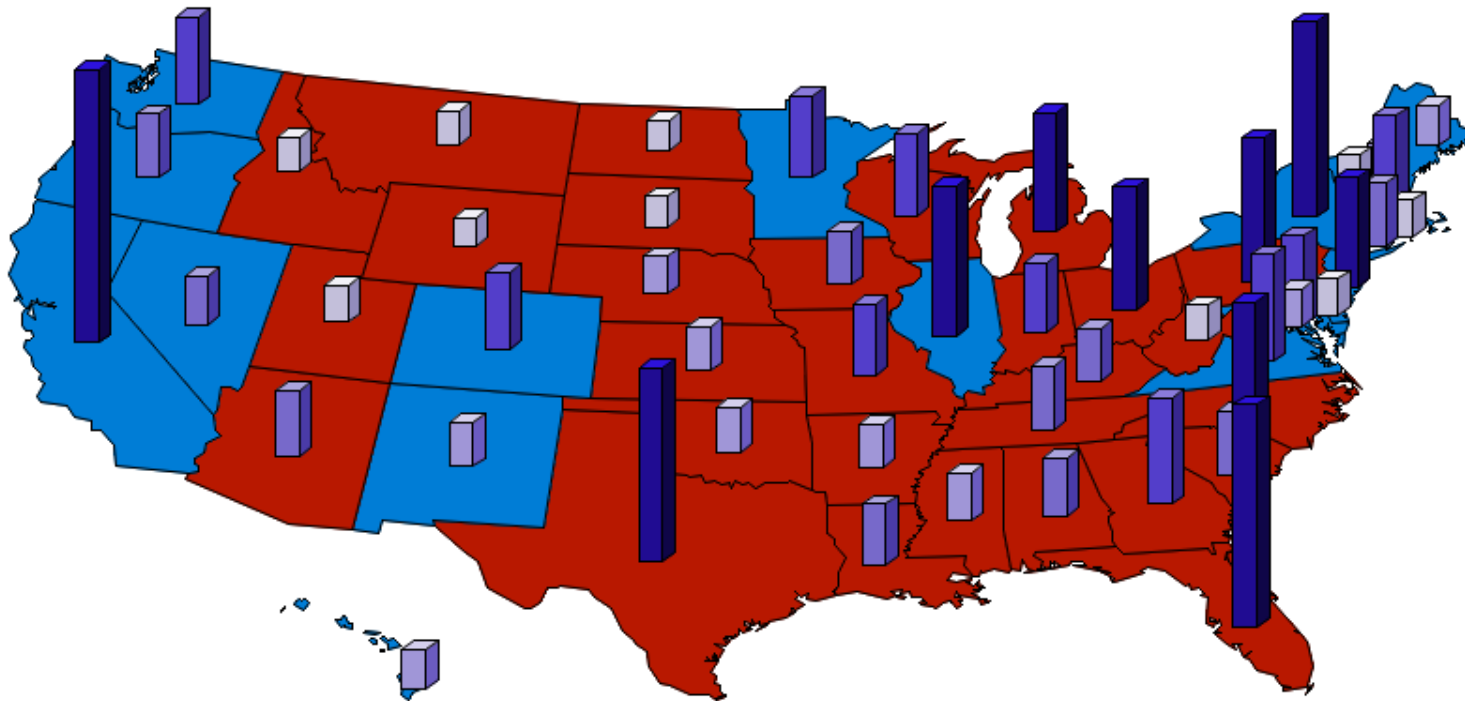
```
pattern11 v=s c=cx533ECA;
```

```
pattern12 v=s c=cx200C92;
```

```
proc gmap data=trail map=mapsgfk.us;
  id state;
  area win_2012 / levels=2 legend=legend1;
  block dem_2012 / levels=5 legend=legend2;
  format win_2012 dem_2012 comma12.;
run;
quit;
```

Democrats Won State vs Republicans Won State With Democrats Vote-2016

Using the AREA and BLOCK statements with PROC GMAP



Democrats votes in 2016 election

55,949 - 249,902

1,031,953 - 1,964,768

260,223 - 462,001

2,021,756 - 5,931,283

537,753 - 936,250

1 Republican 2 Democrats

1 2

```
legend2 label=('Democrats votes in 2016 election ');
legend1 label=('1 Republican 2 Democrats');
```

```
/* Map area patterns */
```

```
pattern1 v=ms c=cxb81800;
```

```
pattern2 v=ms c=cx007dd6;
```

```
/* Block patterns */
```

```
pattern8 v=s c=cxC3BFDA;
```

```
pattern9 v=s c=cxA096D7;
```

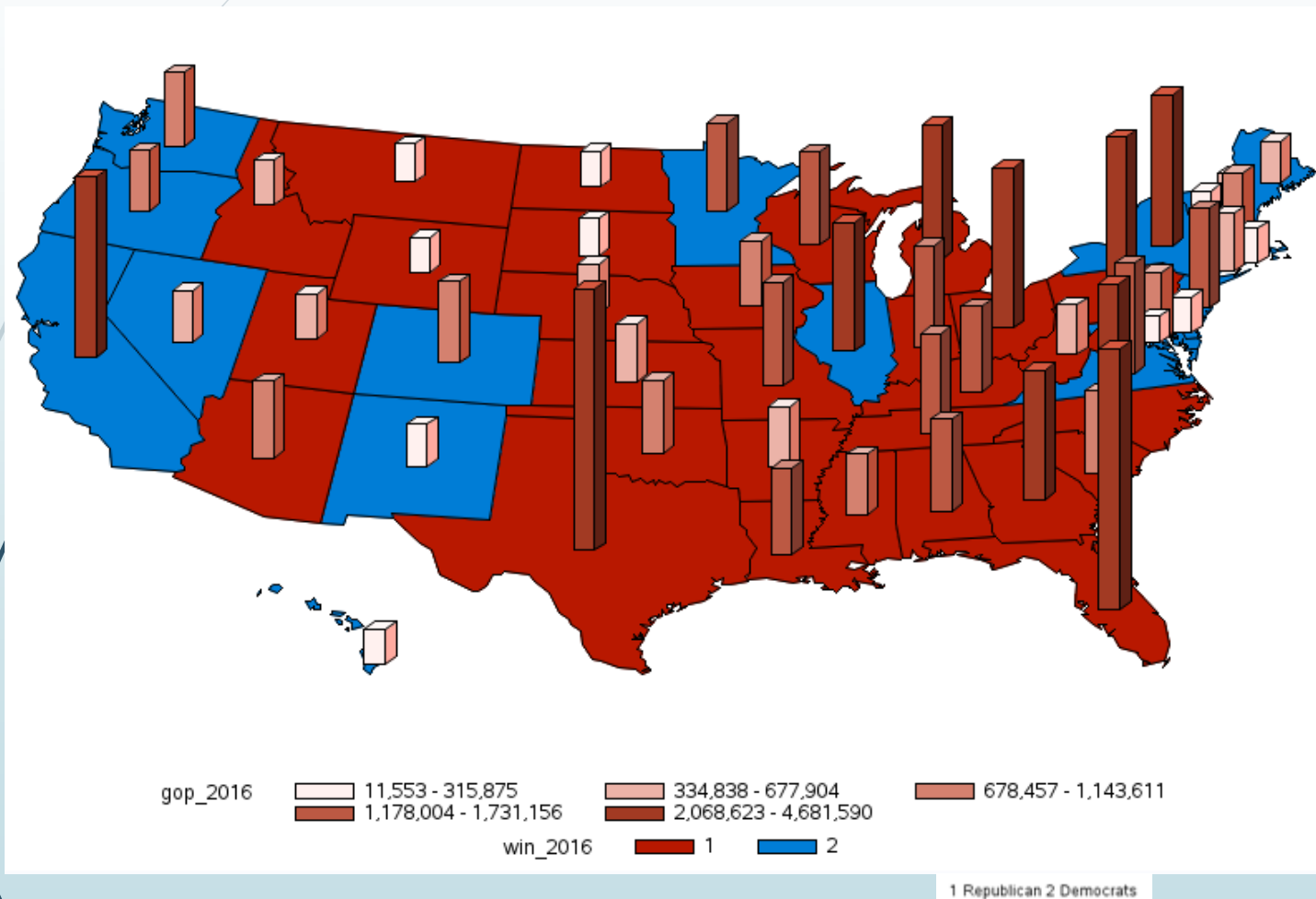
```
pattern10 v=s c=cx7769CA;
```

```
pattern11 v=s c=cx533ECA;
```

```
pattern12 v=s c=cx200C92;
```

```
proc gmap data=trail map=mapsgfk.us;
  id state;
  area win_2016 / levels=2 legend=legend1;
  block dem_2016 / levels=5 legend=legend2;
  format win_2016 dem_2016 comma12.;
run;
quit;
```


Democrats Won State vs Republicans Won State With Republicans Vote-2016



```
proc gmap data=trail map=mapsgfk.us;
  id state;
  area win_2016 / levels=2 legend=legend1;
  block gop_2016 / levels=5 legend=legend2;
  format win_2016 gop_2016 comma12.;
run;
quit;
```

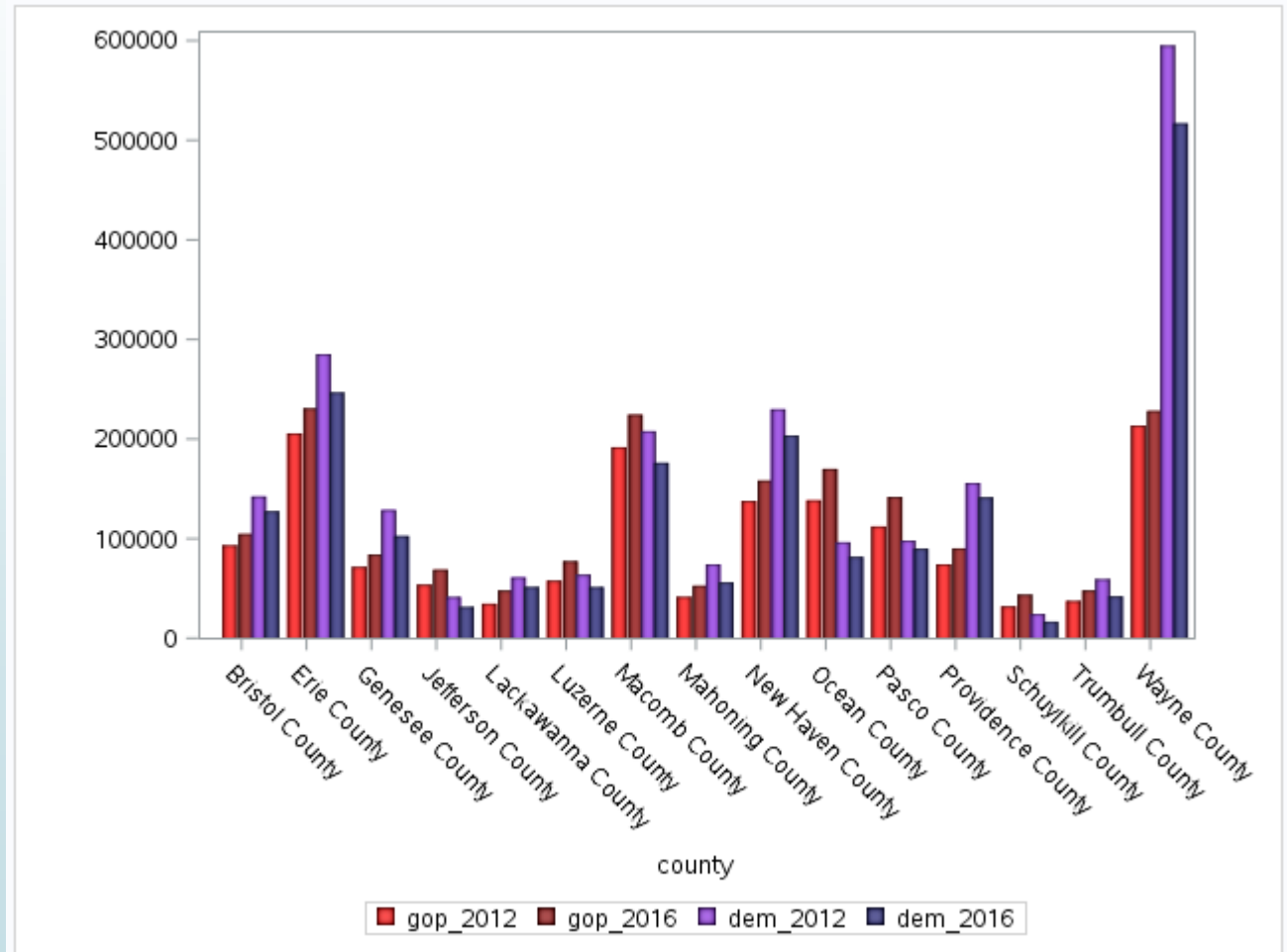
East and North Side of US Votes Switch Democrats' to Republicans'

Obs	State	county	dem_2012	dem_2016	gop_2012	gop_2016	gop_16_12
1	Michigan	Macomb County	207992	176238	191896	224589	32693
2	New Jersey	Ocean County	96500	81845	138594	170103	31509
3	Florida	Pasco County	98148	89998	112335	141943	29608
4	Connecticut	New Haven County	230040	203601	137942	158373	20431
5	Pennsylvania	Luzerne County	63974	51454	57969	77508	19539
6	Rhode Island	Providence County	156022	141597	74344	90321	15977
7	Missouri	Jefferson County	41570	31546	53973	68973	15000
8	Michigan	Wayne County	595253	517022	213586	228313	14727
9	New York	Erie County	220184	192065	159678	173817	14139
10	Pennsylvania	Lackawanna County	61309	51593	34730	48102	13372
11	Michigan	Genesee County	128972	102744	71807	84174	12367
12	Pennsylvania	Schuylkill County	24453	16724	32156	43937	11781
13	Massachusetts	Bristol County	142481	127619	93448	104775	11327
14	Ohio	Mahoning County	74298	56188	41702	52808	11106
15	Pennsylvania	Erie County	65136	54820	46102	57168	11066
16	Ohio	Trumbull County	59446	42130	37545	48152	10607

```

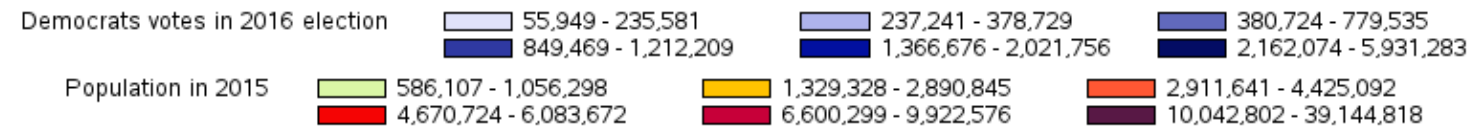
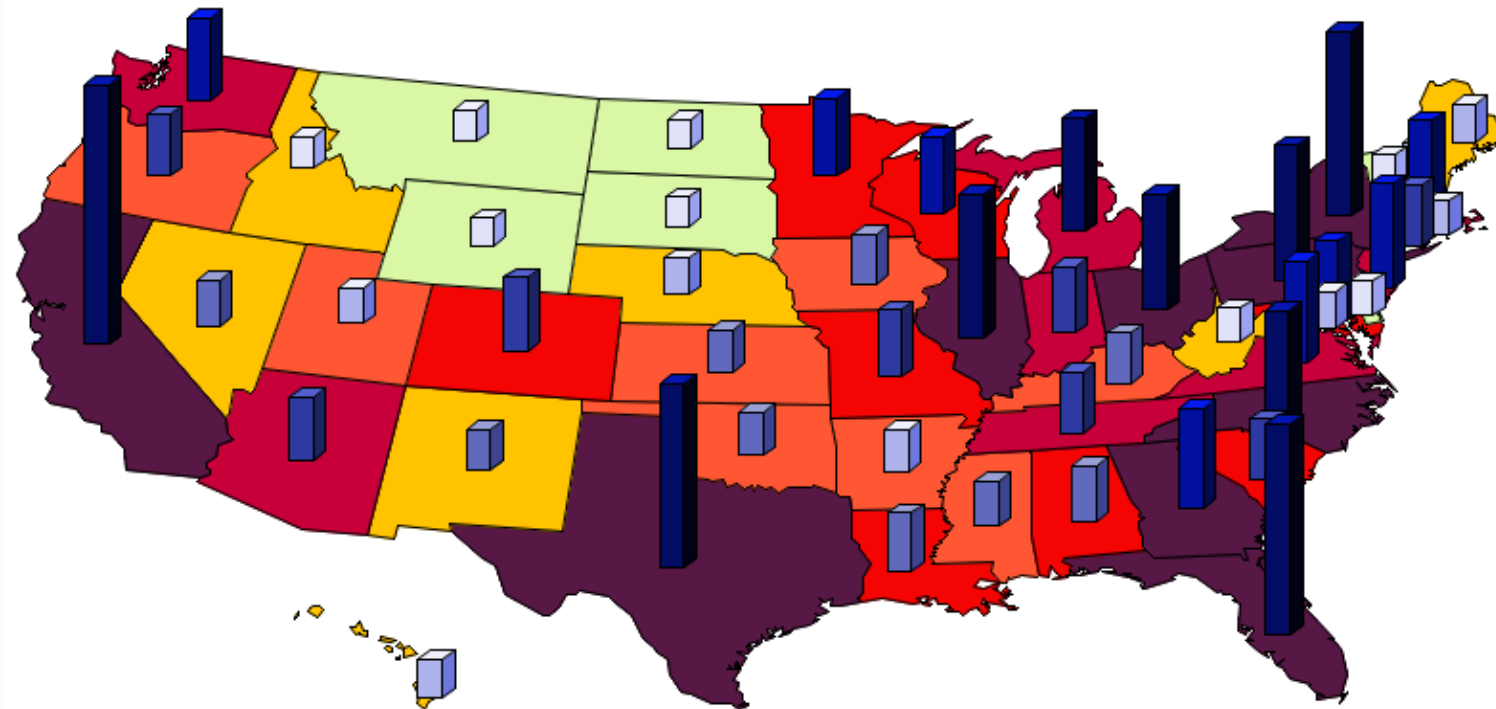
proc sql;
create table ll2 as
select State, county, dem_2012, dem_2016, gop_2012, gop_2016
from sa_hm.el2
where (dem_2016-dem_2012<-6000) and (gop_2016-gop_2012>10000) ;
quit;
run;

```



Democrats 2016 Votes vs Population

Using the AREA and BLOCK statements with PROC GMAP



Summary

- Democratic party won considerably low number of counties in all three election even though they win the two of them.
- Democratic party has highest number of votes in total for all three election even though they lost the 2016 election.
- Democratic party tend to win high crowded states and counties compare with state and counties which won by republican party.
- Republican party keep increasing number of wining state and counties while Democratic party keep losing number of wining state and counties from 2008.
- Republican party keep attacking Democratic party votes in the east side of the USA from 2008 to 2016
- Republican party's votes keep increasing in 1552 counties from 2008 to 2016.
- Democratic party's votes keep falling in 2448 counties from 2008 to 2016.

Thank
You!

