

Part 1

Question 1: Descriptive Statistics

The following table shows the main statistics of the statedata.csv dataset.

Table 1: Statistics of the statedata.csv dataset

Statistic	Mean	St. Dev.	Min	Max
Population	4,246.420	4,464.491	365	21,198
Income	4,435.800	614.470	3,098	6,315
Illiteracy	1.170	0.610	0.500	2.800
Life.Exp	70.879	1.342	67.960	73.600
Murder	7.378	3.692	1.400	15.100
HS.Grad	53.108	8.077	37.800	67.300
Frost	104.460	51.981	0	188
Area	70,735.880	85,327.300	1,049	566,432
state.area	72,367.980	88,278.010	1,214	589,757

Question 2: Life Expectancy Analysis

The life expectancy ranges from 67.96 to 73.60 across all the states. The following table shows the first 5 states with the highest life expectancy:

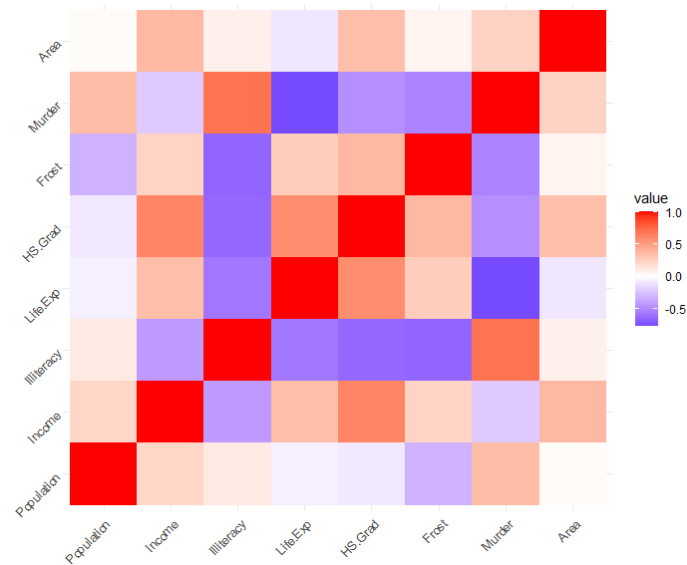
Table 2: The highest-five life expectancy

	state.abb <chr>	Life.Exp <dbl>
1	HI	73.60
2	MN	72.96
3	UT	72.90
4	ND	72.78
5	NE	72.60

Among all the states, Hawaii has the highest life expectancy, and South Atlantic has the lowest.

Question 3: Correlation Heatmap

The following heatmap shows the correlation map of key variables in the dataset.



We can observe that the income and HS.Grad have the strongest positive correlation, while Life.Exp and Murder have the strongest negative correlation. These results seem reasonable.

Part 2

Question 1: Winners

The following table shows the total votes for the highest-voted party in each year.

Table 3: Highest-voted party in each year

	year	candidatevotes	party_detailed
	<int>	<int>	<chr>
1	1976	3882244	REPUBLICAN
2	1980	4522994	REPUBLICAN
3	1984	5467009	REPUBLICAN
4	1988	5054917	REPUBLICAN
5	1992	5121325	DEMOCRAT
6	1996	5119835	DEMOCRAT
7	2000	5861203	DEMOCRAT
8	2004	6745485	DEMOCRAT
9	2008	8274473	DEMOCRAT
10	2012	7854285	DEMOCRAT
11	2016	8753788	DEMOCRAT
12	2020	11110250	DEMOCRAT

Question 2: Election Map

The following graph shows the winner party in each state in 2020.

2020 Presidential Election Results by State

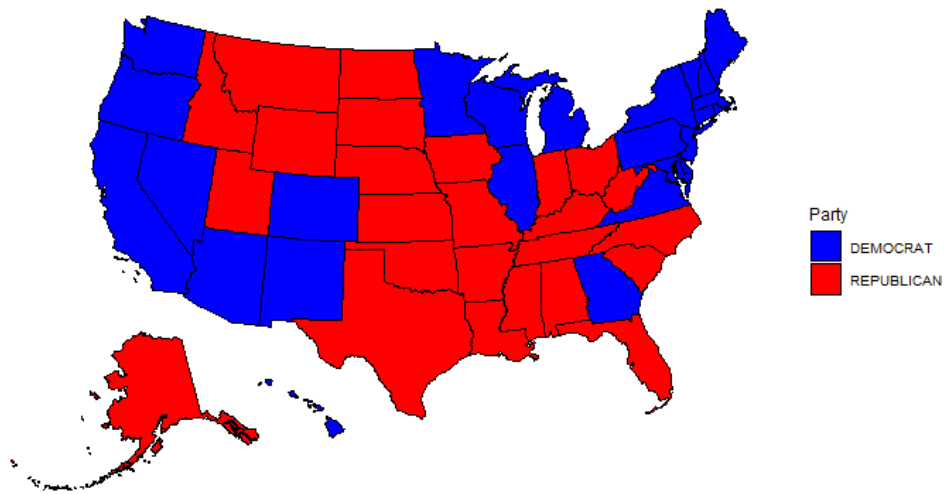


Figure 1: 2020 presidential election results by state

Question 3: Facet plot maps

The following facet graph shows the winner party in each state from 2004 to 2016.

2004, 2008, 2012, 2016 Presidential Election Results by State

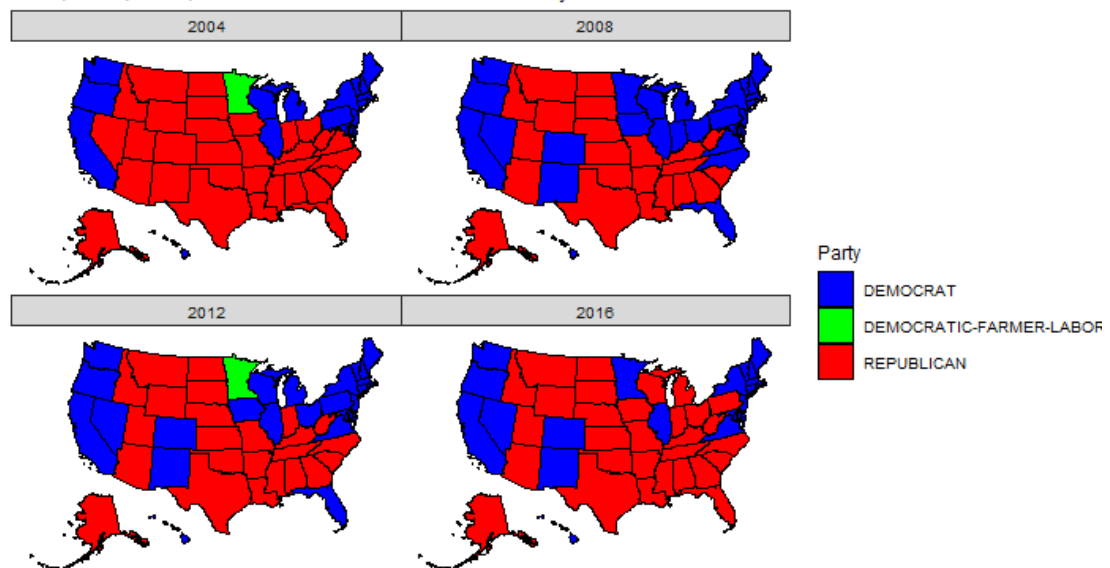


Figure 2: Presidential election results by state

We can observe that state New Mexico and Colorado swayed from Republican to Democrat in 2008, and remain Democrat in the subsequent years. Meanwhile, more and more states in the rust area swayed from Democrat to Republican.

Bonus Question 1: see file "assignment_2_beamer.pdf".

Part 3

The given code sippet has the following bugs:

1. Line 5: "choices datasets" should be "choise=dataset"
2. Line 13: "summmry" is a typo, it should be "summary".
3. Line 17: "plot(dataset)" should be "plot(dataset())".