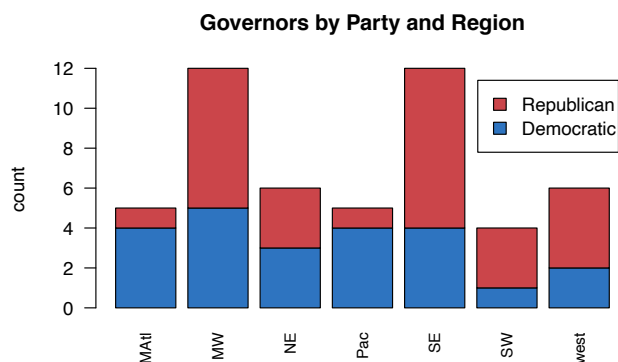


The Scene: We investigate a data set giving information about the current Governors of the 50 US States. **The data matrix** appears on the last page of this worksheet.

1. How many observations does this data set have? How many variables? Classify each variable as numerical or categorical.

2. Below is a bar chart generated in RStudio in an effort to investigate whether there is an association between the **party** and **region** categorical variables of this data set.
 - (a) How many states are in the Mid-West region (MW)? What proportion of these states has a Republican governor?



3. Use the contingency table below to answer the following questions.

	F	M
Democratic	6	17
Republican	3	24

- (a) What proportion of governors are female?

- (b) What proportion of governors are republican?

- (c) What proportion of female governors are republican?

- (d) What proportion of republican governors are male?

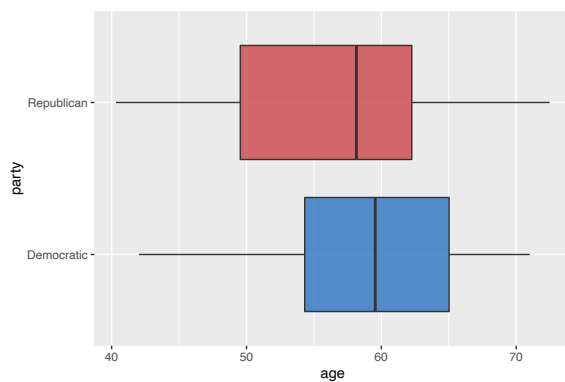
4. The `miss_riv` variable in the Governors data matrix is categorical, with possible values 'W' or 'E', depending on whether the state is west or east of the Mississippi River. You will notice this column has mostly been left blank. Fill it in! You should get 26 'E's and 24 'W's.
5. Determine 5 number summaries for the ages of governors west of the Mississippi, and 5 number summaries for the ages of governors east of the Mississippi.

6. Draw side by side boxplots to make it visually easy to compare these two distributions.

7. Does one region *tend* to have older governors than the other? Explain.

8. If you picked a state from the West at random, and a state from the East at random, which state would you expect to have an older governor? Explain.

9. We can also group the data according to their political party. Here are side-by-side boxplots of governor ages grouped by party. If you picked a governor at random from each political party, which governor would you expect to be older? How confident would you be of your choice?



	state	governor	age.at.inaug	miss_riv	region	sex	party
1	Alabama	Kay Ivey	72	E	SE	F	Republican
2	Alaska	Mike Dunleavy	58	W	Pac	M	Republican
3	Arizona	Doug Ducey	51		SW	M	Republican
4	Arkansas	Asa Hutchinson	64		SE	M	Republican
5	California	Gavin Newsom	51		Pac	M	Democratic
6	Colorado	Jared Polis	44		west	M	Democratic
7	Connecticut	Ned Lamont	65		NE	M	Democratic
8	Delaware	John Carney	61		MAtl	M	Democratic
9	Florida	Ron DeSantis	40		SE	M	Republican
10	Georgia	Brian Kemp	55		SE	M	Republican
11	Hawaii	David Ige	58		Pac	M	Democratic
12	Idaho	Brad Little	65		west	M	Republican
13	Illinois	J. B. Pritzker	54		MW	M	Democratic
14	Indiana	Eric Holcomb	49		MW	M	Republican
15	Iowa	Kim Reynolds	58		MW	F	Republican
16	Kansas	Laura Kelly	69		MW	F	Democratic
17	Kentucky	Andy Beshear	42		SE	M	Democratic
18	Louisiana	John Bel Edwards	49		SE	M	Democratic
19	Maine	Janet Mills	71		NE	F	Democratic
20	Maryland	Larry Hogan	59		MAtl	M	Republican
21	Massachusetts	Charlie Baker	58		NE	M	Republican
22	Michigan	Gretchen Whitmer	47		MW	F	Democratic
23	Minnesota	Tim Walz	55		MW	M	Democratic
24	Mississippi	Tate Reeves	46		SE	M	Republican
25	Missouri	Mike Parson	63		MW	M	Republican
26	Montana	Greg Gianforte	60		west	M	Republican
27	Nebraska	Pete Ricketts	50		MW	M	Republican
28	Nevada	Steve Sisolak	65		west	M	Democratic
29	New Hampshire	Chris Sununu	42		NE	M	Republican
30	New Jersey	Phil Murphy	60		MAtl	M	Democratic
31	New Mexico	Michelle L. Grisham	59		SW	F	Democratic
32	New York	Kathy Hochul	63		MAtl	F	Democratic
33	North Carolina	Roy Cooper	60		SE	M	Democratic
34	North Dakota	Doug Burgum	60		MW	M	Republican
35	Ohio	Mike DeWine	72		MW	M	Republican
36	Oklahoma	Kevin Stitt	46		SW	M	Republican
37	Oregon	Kate Brown	55		Pac	F	Democratic
38	Pennsylvania	Tom Wolf	66		MAtl	M	Democratic
39	Rhode Island	Daniel McKee	70		NE	M	Democratic
40	South Carolina	Henry McMaster	70		SE	M	Republican
41	South Dakota	Kristi Noem	47		MW	F	Republican
42	Tennessee	Bill Lee	59		SE	M	Republican
43	Texas	Greg Abbott	57		SW	M	Republican
44	Utah	Spencer Cox	45		west	M	Republican
45	Vermont	Phil Scott	58		NE	M	Republican
46	Virginia	Ralph Northam	58		SE	M	Democratic
47	Washington	Jay Inslee	62		Pac	M	Democratic
48	West Virginia	Jim Justice	66		SE	M	Republican
49	Wisconsin	Tony Evers	67		MW	M	Democratic
50	Wyoming	Mark Gordon	62		west	M	Republican