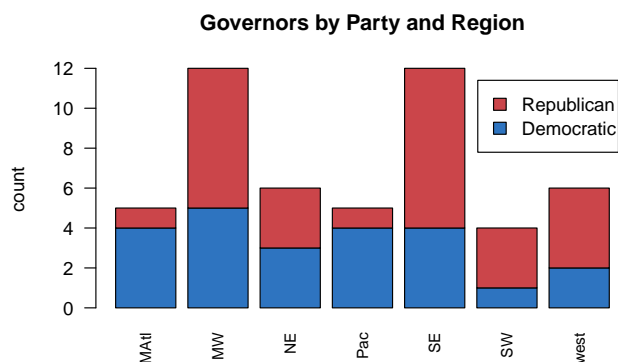


The Scene: We investigate a data set giving information about the current Governors of the 50 US States. **The data matrix** appears on the last page of this worksheet.

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

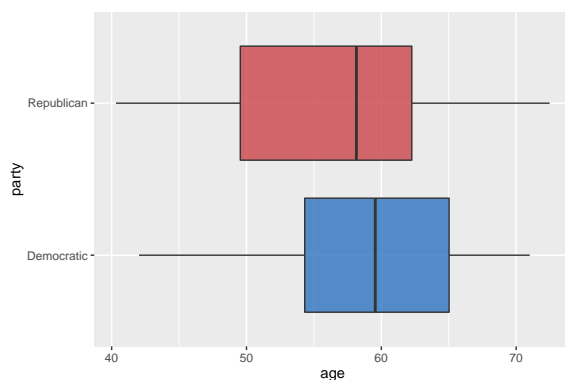
- (a) What proportion of governors are female?

- (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. Looking at the data we see that 26 states are east of the Mississippi and 24 are to the west. Determine the 5 number summary for the ages of the 24 governors west of the Mississippi, and the 5 number summary for the ages of the 26 governors east of the Mississippi.
5. Draw side by side box plots to make it visually easy to compare these two distributions. (An example of side by side box plots appears at the bottom of this page).
6. Does one region *tend* to have older governors than the other? Explain.
7. 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.
8. 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	W	SW	M	Republican
4	Arkansas	Asa Hutchinson	64	W	SE	M	Republican
5	California	Gavin Newsom	51	W	Pac	M	Democratic
6	Colorado	Jared Polis	44	W	west	M	Democratic
7	Connecticut	Ned Lamont	65	E	NE	M	Democratic
8	Delaware	John Carney	61	E	MAtl	M	Democratic
9	Florida	Ron DeSantis	40	E	SE	M	Republican
10	Georgia	Brian Kemp	55	E	SE	M	Republican
11	Hawaii	David Ige	58	W	Pac	M	Democratic
12	Idaho	Brad Little	65	W	west	M	Republican
13	Illinois	J. B. Pritzker	54	E	MW	M	Democratic
14	Indiana	Eric Holcomb	49	E	MW	M	Republican
15	Iowa	Kim Reynolds	58	W	MW	F	Republican
16	Kansas	Laura Kelly	69	W	MW	F	Democratic
17	Kentucky	Andy Beshear	42	E	SE	M	Democratic
18	Louisiana	John Bel Edwards	49	W	SE	M	Democratic
19	Maine	Janet Mills	71	E	NE	F	Democratic
20	Maryland	Larry Hogan	59	E	MAtl	M	Republican
21	Massachusetts	Charlie Baker	58	E	NE	M	Republican
22	Michigan	Gretchen Whitmer	47	E	MW	F	Democratic
23	Minnesota	Tim Walz	55	W	MW	M	Democratic
24	Mississippi	Tate Reeves	46	E	SE	M	Republican
25	Missouri	Mike Parson	63	W	MW	M	Republican
26	Montana	Greg Gianforte	60	W	west	M	Republican
27	Nebraska	Pete Ricketts	50	W	MW	M	Republican
28	Nevada	Steve Sisolak	65	W	west	M	Democratic
29	New Hampshire	Chris Sununu	42	E	NE	M	Republican
30	New Jersey	Phil Murphy	60	E	MAtl	M	Democratic
31	New Mexico	Michelle L. Grisham	59	W	SW	F	Democratic
32	New York	Kathy Hochul	63	E	MAtl	F	Democratic
33	North Carolina	Roy Cooper	60	E	SE	M	Democratic
34	North Dakota	Doug Burgum	60	W	MW	M	Republican
35	Ohio	Mike DeWine	72	E	MW	M	Republican
36	Oklahoma	Kevin Stitt	46	W	SW	M	Republican
37	Oregon	Kate Brown	55	W	Pac	F	Democratic
38	Pennsylvania	Tom Wolf	66	E	MAtl	M	Democratic
39	Rhode Island	Daniel McKee	70	E	NE	M	Democratic
40	South Carolina	Henry McMaster	70	E	SE	M	Republican
41	South Dakota	Kristi Noem	47	W	MW	F	Republican
42	Tennessee	Bill Lee	59	E	SE	M	Republican
43	Texas	Greg Abbott	57	W	SW	M	Republican
44	Utah	Spencer Cox	45	W	west	M	Republican
45	Vermont	Phil Scott	58	E	NE	M	Republican
46	Virginia	Ralph Northam	58	E	SE	M	Democratic
47	Washington	Jay Inslee	62	W	Pac	M	Democratic
48	West Virginia	Jim Justice	66	E	SE	M	Republican
49	Wisconsin	Tony Evers	67	E	MW	M	Democratic
50	Wyoming	Mark Gordon	62	W	west	M	Republican