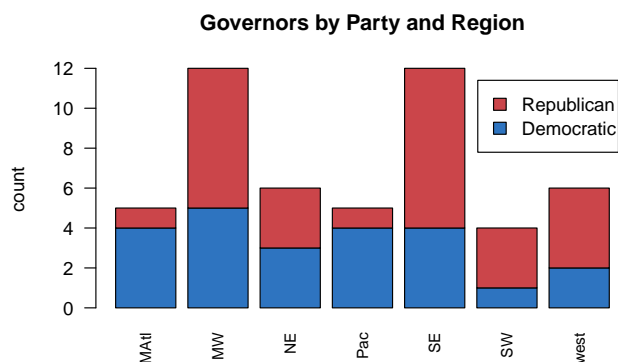


**The Scene:** We investigate a data set giving information about the current Governors of the 50 US States. **The data matrix** appears on the last page of this worksheet.

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?

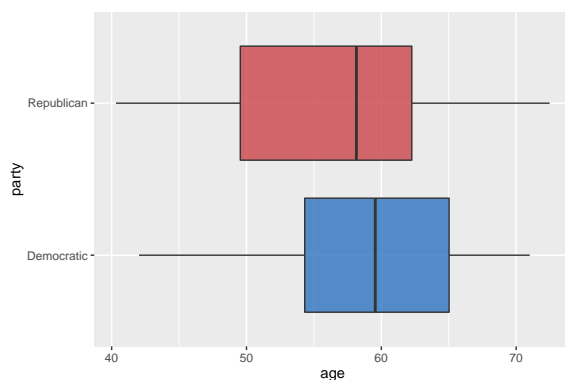


3. Use the contingency table below to answer the following questions.

	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
Alabama	Kay Ivey	72	E	SE	F	Republican
Alaska	Mike Dunleavy	57	W	Pac	M	Republican
Arizona	Doug Ducey	50	W	SW	M	Republican
Arkansas	Asa Hutchinson	64	W	SE	M	Republican
California	Gavin Newsom	51	W	Pac	M	Democratic
Colorado	Jared Polis	43	W	west	M	Democratic
Connecticut	Ned Lamont	65	E	NE	M	Democratic
Delaware	John Carney	60	E	MAtl	M	Democratic
Florida	Ron DeSantis	40	E	SE	M	Republican
Georgia	Brian Kemp	55	E	SE	M	Republican
Hawaii	David Ige	57	W	Pac	M	Democratic
Idaho	Brad Little	64	W	west	M	Republican
Illinois	J. B. Pritzker	53	E	MW	M	Democratic
Indiana	Eric Holcomb	48	E	MW	M	Republican
Iowa	Kim Reynolds	57	W	MW	F	Republican
Kansas	Laura Kelly	68	W	MW	F	Democratic
Kentucky	Andy Beshear	42	E	SE	M	Democratic
Louisiana	John Bel Edwards	49	W	SE	M	Democratic
Maine	Janet Mills	71	E	NE	F	Democratic
Maryland	Larry Hogan	58	E	MAtl	M	Republican
Massachusetts	Charlie Baker	58	E	NE	M	Republican
Michigan	Gretchen Whitmer	47	E	MW	F	Democratic
Minnesota	Tim Walz	54	W	MW	M	Democratic
Mississippi	Tate Reeves	45	E	SE	M	Republican
Missouri	Mike Parson	62	W	MW	M	Republican
Montana	Greg Gianforte	59	W	west	M	Republican
Nebraska	Pete Ricketts	50	W	MW	M	Republican
Nevada	Steve Sisolak	65	W	west	M	Democratic
New Hampshire	Chris Sununu	42	E	NE	M	Republican
New Jersey	Phil Murphy	60	E	MAtl	M	Democratic
New Mexico	Michelle Lujan Grisham	59	W	SW	F	Democratic
New York	Kathy Hochul	62	E	MAtl	F	Democratic
North Carolina	Roy Cooper	59	E	SE	M	Democratic
North Dakota	Doug Burgum	60	W	MW	M	Republican
Ohio	Mike DeWine	72	E	MW	M	Republican
Oklahoma	Kevin Stitt	46	W	SW	M	Republican
Oregon	Kate Brown	54	W	Pac	F	Democratic
Pennsylvania	Tom Wolf	66	E	MAtl	M	Democratic
Rhode Island	Daniel McKee	69	E	NE	M	Democratic
South Carolina	Henry McMaster	69	E	SE	M	Republican
South Dakota	Kristi Noem	47	W	MW	F	Republican
Tennessee	Bill Lee	59	E	SE	M	Republican
Texas	Greg Abbott	57	W	SW	M	Republican
Utah	Spencer Cox	45	W	west	M	Republican
Vermont	Phil Scott	58	E	NE	M	Republican
Virginia	Ralph Northam	58	E	SE	M	Democratic
Washington	Jay Inslee	61	W	Pac	M	Democratic
West Virginia	Jim Justice	65	E	SE	M	Republican
Wisconsin	Tony Evers	67	E	MW	M	Democratic
Wyoming	Mark Gordon	61	W	west	M	Republican