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Application exercise 5.3: Country on track?

Team name: _____

Lab section: 8:30 10:05 11:45 1:25 3:05

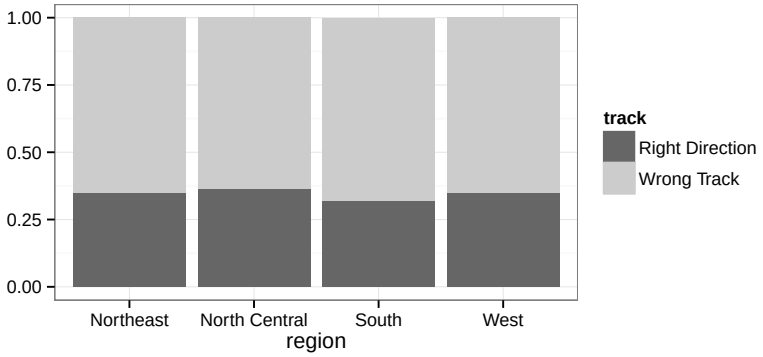
Write your responses in the spaces provided below. WRITE LEGIBLY and SHOW ALL WORK! Only one submission per team is required. One team will be randomly selected and their responses will be discussed and graded. Concise and coherent are best!

The American National Election Studies (ANES) aims to inform explanations of election outcomes by providing data that support rich hypothesis testing, maximize methodological excellence, measure many variables, and promote comparisons across people, contexts, and time. In this question we will focus on two variables from the 2012 ANES dataset:

- region (levels: Northeast, North Central, South, and West), and
- whether the respondent feels things in this country are generally going in the right direction or things have pretty seriously gotten off on the wrong track.

To keep calculations simple we will work with a random sample of 500 respondents from the ANES dataset. The distribution of responses are as follows:

	Right Direction	Wrong Track	Total
Northeast	29	54	83
North Central	44	77	121
South	*62*	131	193
West	36	67	103
Total	171	329	500



Part 1: Region:

According to the 2010 Census, 18% of US residents live in the Northeast, 22% live in the North Central region, 37% live in the South, and 23% live in the West. Evaluate whether the ANES sample is representative of the population distribution of US residents. Make sure to clearly state the hypotheses, check conditions, calculate the appropriate test statistic and the p-value, and make your conclusion in context of the data. **Also** comment on what your conclusion says about whether or not this sample can be considered to be representative of the US population with respect to regional population distribution.

Hypotheses:

Conditions:

Test statistic:

p-value:

Decision (circle one): Reject H_0 Fail to reject H_0

Conclusion in context of the data:

Comment on representative sample:

Region and direction:

1. In evaluating the relationship between region and feeling about the direction things are going in the country, what is the response variable and what is the explanatory variable?
    - response:
    - explanatory:
2. What are the hypotheses for evaluating this relationship?
3. Speculate on whether you would expect to reject or not reject the null hypothesis based on the segmented bar chart shown above. Explain your reasoning in at most two sentences. Note that in this question you are not being asked to actually carry out the hypothesis test.
4. If in fact the null hypothesis is true, how many Southerners would we expect to respond that they feel things in this country are generally going in the right direction?
5. What is the contribution of this cell (South & Right direction) to the test statistic?

6. The χ^2 statistic for this test is 5.2707. Determine is the degrees of freedom associated with this test statistic and the p-value for this test.

7. What is the conclusion of the hypothesis test?