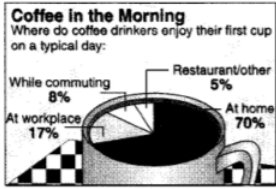


15.2.11: Chapter 12 Homework

1. A bicycle safety organization claims that fatal bicycle accidents are uniformly distributed throughout the week. The table shows the day of the week for which 911 randomly selected fatal bicycle accidents occurred. At $\alpha = 0.10$, can you reject the claim that the distribution is uniform?

<p>(a) (DESIGN) State your Hypothesis</p>	<p>(d) (DATA) Conduct the test and circle your decision</p> <table border="1"> <thead> <tr> <th>Survey</th> <th>Observe</th> <th>p_i</th> <th>Expected</th> <th>ChiSq</th> </tr> </thead> <tbody> <tr> <td>Sunday</td> <td>118</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Monday</td> <td>119</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Tuesday</td> <td>127</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wednesday</td> <td>137</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Thursday</td> <td>129</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Friday</td> <td>146</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Saturday</td> <td>135</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>911</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Survey	Observe	p_i	Expected	ChiSq	Sunday	118				Monday	119				Tuesday	127				Wednesday	137				Thursday	129				Friday	146				Saturday	135				Total	911			
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<p>(b) (DESIGN) State Significance Level of the test and explain what it means.</p>	<p>Reject H_0 Fail to Reject H_0</p>																																													
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2. Results from a five-year-old survey asked where coffee drinkers typically drink their first cup of coffee are shown in the graph. To determine whether this distribution has changed, you randomly select 581 coffee drinkers and asked them where they typically drink their first cup of coffee. The results are shown in the table. Can you conclude that there has been a change in the claimed or expected distribution? Use $\alpha = 0.05$.

<p>(a) (DESIGN) State your Hypothesis</p> <p>(b) (DESIGN) State Significance Level of the test and explain what it means.</p> <p>(c) (DESIGN) Determine the statistical model . Determine decision rule (critical value method)</p>	<p>(d) (DATA) Conduct the test and circle your decision</p> <div style="text-align: center; margin-bottom: 10px;">  </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th>Survey</th> <th>Observe</th> <th>p_i</th> <th>Expected</th> <th>ChiSq</th> </tr> </thead> <tbody> <tr> <td>Home</td> <td>389</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Work</td> <td>110</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Commute</td> <td>55</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Rest/Other</td> <td>27</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>581</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <div style="margin-bottom: 10px;"> <div style="display: flex; justify-content: space-around;"> Reject H_0 Fail to Reject H_0 </div> </div> <p>(e) (CONCLUSION) State your overall conclusion in language that is clear, relates to the original problem and is consistent with your decision</p> 	Survey	Observe	p_i	Expected	ChiSq	Home	389				Work	110				Commute	55				Rest/Other	27				Total	581			
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3. In a SurveyUSA poll, 500 Americans adults were asked if marijuana should be legalized. The results of the poll were cross tabulated as shown in the contingency tables below. Conduct a hypothesis test for independence to determine if opinion about legalization of marijuana is dependent on age.

	Male	Female
Should be Legal	123	90
Should Not be Legal	127	160

4. In a SurveyUSA poll, 500 Americans adults were asked if marijuana should be legalized. The results of the poll were cross tabulated as shown in the contingency tables below. Conduct a hypothesis test for independence to determine if opinion about legalization of marijuana is dependent on gender.

	18-34	35-54	55+
Should be Legal	95	83	48
Should Not be Legal	65	126	83

5. 1000 American adults were recently polled on their opinion about effect of recent stimulus bill and the economy. The results are shown in the following contingency table, broken down by gender:

	Stimulus will hurt economy	Stimulus will help the economy	Stimulus will have no effect	TOTAL

Male	150	150	200	500
Female	100	200	200	500
TOTAL	250	350	400	1000

Are gender and opinion on the stimulus dependent variables? Test using $\alpha = 1\%$.

For the studies in questions 6 to 8, answer the following questions. (You will not have to actually conduct tests).

- State the Null and Alternative Hypotheses in words
 - State the Null and Alternative Hypotheses in population parameters
 - Choose the appropriate model from among these three:
 - One population test of proportion
 - Chi-square goodness of fit
 - Chi-square test of independence
6. Starting in 2018, the California State University System (CSU) changed their prerequisite requirements for a Statistics course needed for community college students to transfer. The original provision was that students needed to take Intermediate Algebra before Statistics. The new requirement is that students can take Intermediate Algebra or an alternative path to Statistics course as a prerequisite for Statistics. There is some concern that students who choose the alternative path may be less successful after transferring to CSU. A study is proposed to determine the graduation rates in 3 years for transfer students who passed Intermediate Algebra and those who passed the alternative course. Data will be collected and cross-tabulated into two questions: "What path did the student choose?" and "Did the student graduate within 3 years of transfer?"
7. The Achilles tendon connects the calf muscle to the heel bone. Of the patients who rupture (tear) the Achilles tendon and have it surgically repaired, 11% will re-rupture the Achilles tendon within three years of treatment. A proposed non-surgical method of treatment would treat the rupture with a series of casts, ultrasound and passive motion. The researcher wanted to show that the percentage of patients who choose the non-surgical method of treatment had a reduced percentage of re-ruptures.
8. A sport's shoe company has designed a women's running shoe and is considering producing the shoe in 4 different colors: pink, blue, teal and gray. The company wants to know if there is a preference among women for a specific color of the shoe. 154 women who are runners will participate in the study.

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