**Part VII: Chapter 7: Confidence Intervals**

**For the purposes of confidence intervals, we will consider these 118 candidates to be a sample of the larger population of firefighters nation-wide who took this promotion exam.**

**Task 1: Use Statdisk to complete the contingency tables for passing status versus race for both the Lieutenants and Captains exams.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Lieutenants:** | **Black** | **Hispanic** | **White** |
| **Pass** |  |  |  |
| **Fail** |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Captains:** | **Black** | **Hispanic** | **White** |
| **Pass** |  |  |  |
| **Fail** |  |  |  |

**Task 2: Use the data set to find**  **(p hat) for each of the following:**

* **Among the black candidates for lieutenant exam, what was the percentage who passed?**
* **Among the Hispanic candidates for lieutenant exam, what was the percentage who passed?**
* **Among the white candidates for lieutenant exam, what was the percentage who passed?**
* **Among the black candidates for captain exam, what was the percentage who passed?**
* **Among the Hispanic candidates for captain exam, what was the percentage who passed?**
* **Among the white candidates for captain exam, what was the percentage who passed?**

**Task 3: Use the data set to find**  **(p hat) for the percent of the sample that are applying for the captain’s position.**

* **Describe what requirements must be met for this interval to be valid and whether you think that this data set meets these requirements.**
* **Based on this data, construct a 95% confidence interval for the percentage of firefighters that will apply for a Captain’s rank.**
* **Interpret the meaning of the confidence interval in words.**
* **Can we confidently state that less than half of the candidates are taking the test for Captain? Why or why not?**

**Task 4: Use the mean score for the oral exam of all candidates to construct and complete the confidence interval table below.**

|  |  |  |
| --- | --- | --- |
| **Confidence Level** | **Confidence Interval** | **Margin of Error** |
| **80%** |  |  |
| **90%** |  |  |
| **95%** |  |  |
| **98%** |  |  |
| **99%** |  |  |

**Be examining this table, answer the following questions.**

* **As the confidence level increases, what happens to the width of the interval?**
* **As the confidence level increases, what happens to the margin of error?**
* **If the confidence level were 92%, would the confidence interval estimate be more or less precise than for 95%?**