Qualitative 1 Population

The Qualitative – One Population VISA procedures allow the user to perform descriptive and inferential procedures for problems involving one population with qualitative (proportion) data. Data is entered for up to 2000 observations with 10 classifications in worksheet ED.

Three analytical sections are provided:
- Graphical Analysis Procedures
- Inferential Analysis Procedures
- Calculate Sample Size.

The worksheets for these procedures are:
- TS – tabular summary of frequency, relative frequency, and percent frequency by classification
- RFB – relative frequency bar chart
- RFP – relative frequency pie chart
- PE – calculations for Point Estimates by classification
- CI – calculations for Confidence Intervals with interpretations for a user selected confidence level
- HT – the user selects a significance level, classification and hypothesized proportion based on the problem. Once these selections are made, the Hypothesis Test selection for a two tail (not-equal), right tail (greater than) or left tail (less than) are made from an option box to view the results of the Hypothesis Test. The p-value for the test is displayed with an interpretation of the results
- SS – calculates the Sample Size necessary for a user selected classification, allowable error and confidence level

Example: In this example Machine A produces parts: 1 – Not Defective and 2 – Defective.
**ED worksheet**

The label for the population, Machine A (displayed in red) is entered into cell B4. The data is entered beginning at cell B5.

The class and class description are entered beginning at cell D6.

**TS worksheet**

Automatically displays the Machine A tabular summary.

In this example, we see that 189 out of 200 parts (.9450) were not defective. 11 out of 200 parts (.0550) were defective.
RFB worksheet
Shows the relative frequency bar graph

RFP worksheet
Shows the relative frequency pie chart
The point estimate for the population proportion defective based on the sample for each classification is displayed.

The confidence Interval calculations are not made until the user selects a confidence level. Once it has been entered the estimate of the population proportion defective confidence interval for each classification are automatically calculated and displayed.

A verbal interpretation is provided in the worksheet. A comment reminds the user of the definition of confidence level.
The student is required to enter a significance level and hypothesized difference. Callout comments show the definition of these terms. They then select the "option box" alternative for the hypothesis test and a visual representation of the mathematical null and alternative are shown. The student can immediately verify that they are testing the correct hypothesis. In addition, VISA, provides the numerical p-value for the t-test. A message is displayed reminding the student that the results of the p-value calculation can identify whether the null or alternative hypothesis is "statistically" true.

If the user wants to know how many parts should be observed to have an allowable error of .01 the information is entered as shown and the result of 1997 hours is automatically calculated.