Data Set: See the data below

Summary

The Stanford-Binet IQ test is nationally normed with a mean of 100 and a standard deviation of 15. A principal in an elementary school believes that her students have above-average intelligence and wants verification of her belief. She randomly selects 20 students and checks the student files. You will use as z-test to determine whether the students in this school have above-average intelligence, and will summarize your findings in a report.

Note: Most often, the standard deviation of the population is unknown. Therefore, the *z*-test is rarely used in practice.

Create a JMP Data Table

The IQ scores for the 20 students are in the table below.

Student Name	IQ
Kathy	110
Mike	132
Adam	98
Celia	97
Christina	115
Aaron	145
Elaine	77
Jesse	130
Sam	114
Nikki	128
Amanda	89
Steve	101
Jason	92
Tabitha	85
Mindy	112
Drew	79
Shailja	139
Samir	102
Robert	103
Tiffany	89

In JMP, select **New Data Table** from the **JMP Starter** window (or use **File > New > New Data Table**).

Click on the Column 1 header and enter **Student Name**. Double-click in the column header next to **Student Name** to create a new column, and name this **IQ**. Enter the data into the data table.

Once you've created the data table, go to **File > Save As** to save.

Note: If you have an electronic version of this lab, this data can be copied and pasted directly into JMP. To do this, (1) copy the data from the table, starting with the column header, (2) open a new data table in JMP (don't click anywhere in the table), and (3) in JMP select **Edit > Paste with Column Names**.

Conducting a *z*-test in JMP

To conduct a *z*-test using JMP, go to **Analyze > Distribution**, select **IQ** for the **Y, Columns** variable and click **OK**.

Click on the **red triangle** next to **IQ**, and select **Test Mean**.

Enter the normed values for the mean (100) and standard deviation (15), and click **OK**.

Test Mean	
Specify Hypothesized Mean	100
Enter True Standard Deviation to do z-test rather than t test	15
If you also want a nonparametric test:	
☐ Wilcoxon Signed Rank	
?	Cancel OK
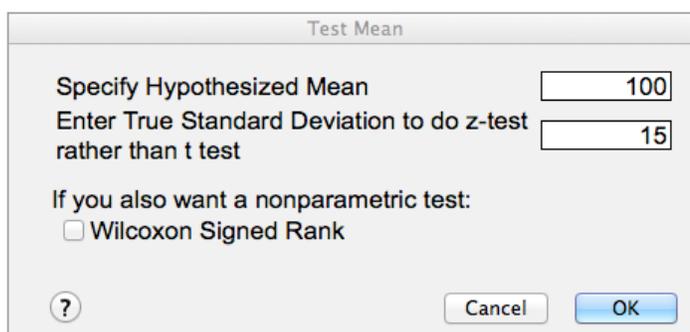
The results are provided in the **Test Mean** table.

- The p-value for the two-sided test is reported next to **Prob > |z|**.

- The p-value for the one-sided tests are reported next to **Prob > z** and **Prob < z**.

  (Hint: The signs in the one-sided p-values correspond to the signs in the alternative hypotheses.)

▼Test Mean	
Hypothesized Value	100
Actual Estimate	106.85
DF	19
Std Dev	19.8793
Sigma given	15
z Test	
Test Statistic	2.0423
Prob > |z|	0.0411*
Prob > z	0.0206*
Prob < z	0.9794

Using your results from JMP, write a complete hypothesis test report, using the α = .05 significance level.

Include:

- *Assumptions.*
- *Hypotheses.*
- *Sample statistic values.*
- *The test statistic.*
- *The p-value.*
- *Conclusions in the context of the problem.*

In addition, copy the data table, a graphical display of the data, and hypothesis test results from JMP into your report.

Circle the test statistic and p-value results from the JMP output, and explain how you chose the proper p-value for this test.

Excluding an Extreme Value

Aaron has the highest IQ in this sample of students. We are going to exclude Aaron from the analysis to see if your results would have been different had Aaron not been chosen.

To do this, select Aaron in the data table, and choose **Rows > Exclude/Unexclude**.

Repeat the hypothesis test with Aaron excluded (if the Distribution output window is still open, click on the **top red triangle**, and select **Script > Redo Analysis**).

Discuss how your results differ from the sample with Aaron included.

Include a copy of the hypothesis test results from JMP in your report.