

MINITAB/TI Calculator Reference

Math 214

Neil Martinsen-Burrell

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1 Chapter 1: Doing Statistics

Unless specified otherwise, all Minitab instructions assume that raw data is in C1. All TI instructions assume that raw data is in L1.

1.1 Simple Random Sampling

Find a sample of size n from the numbers $1, 2, 3, \dots, N$.

Minitab

1. Select **CALC**→**Set Base**. Choose a seed.
2. Select **CALC**→**Random Data**→**Integer**. Select n rows, minimum 1, maximum N .

TI Calculator

1. Enter a seed. Press **STO**. Select **MATH**→**PRB**→**RAND**.
2. Select **MATH**→**PRB**→**randInt** (. Enter 1, N .
3. Press enter n times

2 Chapter 2: Organizing Data

2.1 Frequency Distributions

Make a frequency distribution from raw data

Minitab

1. Select **Stat**→**Tables**→**Tally**
2. Check Counts or Percents (relative frequency).

2.2 Bar Graphs

Make a bar graph from categorical data

Minitab

1. Put categories in C1, (relative) frequencies in C2.
2. Select **Graph**→**Chart**.
3. Choose C2 for X and C1 for Y.

Make a bar graph from raw data

Minitab

1. Put raw data in C1.
2. Select **Graph**→**Chart**.
3. Choose C1 for X and nothing for Y.

2.3 Pie Charts

Make a pie chart from a relative frequency distribution.

Minitab

1. Put categories in C1, frequencies in C2
2. Select **Graph**→**Pie Chart**.
3. Choose “Chart Table” and enter C1 and C2.

2.4 Histograms

Make a histogram from raw data.

Minitab

1. Select **Graph**→**Histogram**.
2. Select C1 for X.

For relative frequency histogram, choose **Options** and select “Percents”.

2.5 Stem and Leaf Plots

Make a stem and leaf plot from raw data.

Minitab

1. Select **Graph**→**Stem-and-Leaf**.
2. Choose C1.

3 Chapter 3: Numerical Descriptions

3.1 Numerical Measures

To find mean, median, standard deviation and the five number summary

Minitab

1. Select **Stat**→**Basic Statistics**→**Display Descriptive Statistics**
2. Select C1.

TI Calculator

1. Select **STAT**→**CALC**→**1-Var Stats**
ENTER **ENTER**

3.2 Numerical Measures for grouped data

To find mean, etc. for grouped data

TI Calculator

1. Enter class midpoints in L1 and frequencies or relative frequencies in L2.
2. Select **STAT**→**CALC**→**1-Var Stats**
ENTER
3. Type **2nd** **1,2nd** **2** **ENTER**

3.3 Boxplots

Make a boxplot with raw data.

Minitab

1. Select **Graph**→**Boxplot**
2. Choose C1 for Y

To make a horizontal boxplot, select **Options** and check “Transpose X and Y”.

4 Chapter 4: Regression

The explanatory variable is assumed to be in C1 and the response variable in C2.

4.1 Scatter Plots

Make a scatter plot of bivariate data.

Minitab

1. Select **Graph**→**Plot**
2. Choose C2 for Y and C1 for X.

TI Calculator

1. Select 2nd **Y=** → Plot1
2. Set to “On”, choose scatter plot icon (top left), L1 for Xlist, L2 for Ylist.
3. Press **ZOOM** → ZoomStat

4.2 Correlation Coefficient

Find the correlation coefficient r for bivariate data

Minitab

1. Select **Stat** → **Basic Statistics** → **Correlation**.
2. Select C1 and C2.

TI Calculator

1. Select 2nd **0** → DiagnosticOn
2. Press **STAT** → CALC → LinReg (ax+b).

4.3 Linear Regression

Find the least square regression line.

Minitab

1. Select **Stat** → **Regression** → **Regression**.
2. Choose C2 for Response and C1 for Predictor.

TI Calculator

1. Select 2nd **0** → DiagnosticOn
2. Press **STAT** → CALC → LinReg (ax+b).

4.4 Coefficient of Determination

Find the coefficient of determination R^2 .

Minitab

1. Find the regression line as above and look for “R-Sq”.

TI Calculator

1. Find the regression line as above and look for “ r^2 ”.

4.5 Residual Plots

Plot the residuals from the linear regression line.

Minitab

1. Select **Stat** → **Regression** → **Regression**
2. Choose C2 for Response, C1 for Predictor
3. Select **Graphs**.
4. Choose “Residuals versus the Variables” and select C1.

y

TI Calculator

1. Select 2nd **Y=** → Plot1.
2. Set to “On”, choose scatter plot icon (top left), L1 for Xlist, RESID for Ylist. (You can select RESID by pressing 2nd **STAT**.)
3. Press **ZOOM** → ZoomStat.

5 Chapter 6: Discrete Probability Distributions

5.1 Mean and Standard Deviation

Find the mean and standard deviation of a discrete random variable.

TI Calculator

1. Store the values of the random variable in L1 and the corresponding probabilities in L2.
2. Choose **STAT** → CALC → 1-Var Stats
3. Type L1, L2, press **ENTER**.

5.2 Binomial Probabilities

Compute $P(X = x)$ for a binomial random variable.

Minitab

1. Enter the values of x in C1.
2. Choose **Calc** → **Probability Distributions** → **Binomial**.
3. Be sure “Probability” is selected.
4. Enter the number of trials and success probability.
5. Choose “Input Column” C1. Click “OK”.

TI Calculator

1. Choose 2nd **VARS** → binompdf (.
2. Enter values of n , p and x . Press **ENTER**.

5.3 Cumulative Binomial Probabilities

Compute $P(X \leq x)$ for a binomial random variable.

Minitab

1. Enter the values of x in C1.
2. Choose **Calc** → **Probability Distributions** → **Binomial**.
3. Select “Cumulative Probability”.
4. Enter the number of trials and success probability.

5. Choose “Input Column” C1. Click “OK”.

TI Calculator

1. Choose 2nd **VAR** → binomcdf (.
2. Enter values of n , p and x . Press **ENTER**.

6 Chapter 7: The Normal Distribution

6.1 Area to the left of a Z-value

Compute the area under a standard normal curve left of some point.

Minitab

1. Choose **Calc** → **Probability Distributions** → **Normal**.
2. Be sure “Cumulative Probability” is selected.
3. Set the mean to 0 and the standard deviation to 1.
4. Select “Input Constant” and enter the Z-score. Click “OK”.

6.2 Area under a normal curve

Compute the area under a normal curve with mean μ , standard deviation σ between two points a and b . (Use $a = -1E99$ for areas to the left of b and $b = 1E99$ for areas to the right of a .)

TI Calculator

1. Choose 2nd **VAR** → normalcdf (.
2. Enter values of a , b , μ and σ . Press **ENTER**.

6.3 Z-score for a specified area

Find the Z-score with a specified area to the left.

Minitab

1. Choose **Calc** → **Probability Distributions** → **Normal**.
2. Select “Inverse Cumulative Probability”.
3. Set the mean to 0 and the standard deviation to 1.
4. Select “Input Constant” and enter the area. Click “OK”.

TI Calculator

1. Choose 2nd **VAR** → invNorm (.
2. Enter the area, 0 and 1. Press **ENTER**.

6.4 Normal Probability Plots

Make a normal probability plot from given data.

Minitab

1. Choose **Graph** → **Probability Plot**.
2. Make sure “Normal” is selected.
3. Enter the column that contains the raw data. Click “OK”.

7 Chapter 9: Confidence Intervals

7.1 Confidence interval for μ with σ known

Compute a $(1 - \alpha)100\%$ confidence interval for the mean given raw data and the population standard deviation σ .

Minitab

1. Choose **Stat** → **Basic Statistics** → **1-sample Z**.
2. Enter C1 for “Variables”, enter the value of σ and enter the confidence level $1 - \alpha$. Click “OK”.

TI Calculator

1. Select **STAT** → TESTS → ZInterval.
2. Highlight DATA. Enter σ and the confidence level.
3. Highlight Calculate. Press **ENTER**.

7.2 Confidence interval for μ with σ unknown

Construct a $(1 - \alpha)100\%$ confidence interval for the mean given only raw data.

Minitab

1. Choose **Stat** → **Basic Statistics** → **1-sample t**
2. Enter C1 for “Variables” and the confidence level $1 - \alpha$. Click “OK”.

TI Calculator

1. Select **STAT** → TESTS → TInterval.
2. Make sure DATA is highlighted. Enter the confidence level.
3. Highlight Calculate. Press **ENTER**.

7.3 Confidence Interval for p

Construct a $(1 - \alpha)100\%$ confidence interval for the population proportion p .

Minitab

1. Choose **Stat**→**Basic Statistics**→**1 Proportion**
2. Enter the n and x .
3. Under “Options” choose a confidence level.

TI Calculator

1. Choose **STAT**→**TESTS**→**1-PropZInt**.
2. Enter n and x and the confidence level.
3. Highlight **Calculate**. Press **ENTER**.

8 Chapter 10: Hypothesis Testing

All of the methods in this section should give a P -value which can be compared to the significance level α to determine whether or not to reject the null hypothesis.

8.1 Testing Claims about μ with σ known

Test a hypothesis $H_0 : \mu = \mu_0$ knowing the population standard deviation σ .

Minitab

1. Choose **Stat**→**Basic Statistics**→**1-Sample Z**.
2. Choose C1 for “Variables”. Under “Options” select the type of alternative and the confidence level.
3. Enter μ_0 for the “Test Mean” and σ for the “Standard Deviation”. Click “OK”.

TI Calculator

1. Press **STAT**→**TESTS**→**Z-Test**.
2. Enter μ_0 , \bar{x} , σ , n and the type of alternative.
3. Highlight **Calculate**. Press **ENTER**.

8.2 Testing Claims about μ with σ unknown

Test a hypothesis $H_0 : \mu = \mu_0$ knowing only the sample standard deviation.

Minitab

1. Choose **Stat**→**Basic Statistics**→**1-Sample t**.
2. Choose C1 for “Variables”. Under “Options” select the type of alternative and the confidence level.
3. Enter μ_0 for the “Test Mean”. Click “OK”.

TI Calculator

1. Press **STAT**→**TESTS**→**T-Test**.
2. Enter μ_0 , \bar{x} , $Sx = \sigma$, n and the type of alternative.
3. Highlight **Calculate**. Press **ENTER**.

8.3 Testing Claims about a population proportion

Test a hypothesis $H_0 : p = p_0$.

Minitab

1. Choose **Stat**→**Basic Statistics**→**1-Proportion**.
2. Enter n and x . Choose “Options” and enter p_0 for “Test Proportion” and the type of alternative. Check the box for “Use normal distribution”.
3. Click “OK”.

TI Calculator

1. Press **STAT**→**TESTS**→**1-PropZTest**.
2. Enter p_0 , x , n and the type of alternative.
3. Highlight **Calculate**. Press **ENTER**.

9 Chapter 11: Comparing Two Samples

9.1 Hypotheses about matched-pairs

Test a hypothesis $H_0 : \mu_d = 0$.

Minitab

1. Enter raw data in C1 and C2.
2. Choose **Stat**→**Basic Statistics**→**Paired-t**.
3. Enter C1 for “First Sample” and C2 for “Second Sample”.
4. Select “Options” and choose the type of alternative and confidence interval. Click “OK”.

TI Calculator

1. Press **STAT**→**TESTS**→**T-Test**.
2. Enter \bar{d} for \bar{x} and s_d for Sx .
3. Choose type of alternative. Highlight “Calculate” and press **ENTER**.
4. NOTE: For confidence intervals in this situation you can use **TInterval**.

9.2 Hypotheses about two means, independent samples

Test a hypothesis $H_0 : \mu_1 = \mu_2$.

Minitab

1. Enter raw data in C1 and C2.
2. Choose **Stat**→**Basic Statistics**→**2-Sample t**.
3. Choose C1 and C2 for “Variables”. Under “Options” choose the type of alternative and a confidence level. Click “OK”.

TI Calculator

1. Press **STAT**→TESTS→2-SampTTest.
2. Enter \bar{x}_1 , n_1 , \bar{x}_2 , n_2 and the type of alternative.
3. Highlight “Calculate” and press **ENTER**.
4. NOTE: For confidence intervals in this situation you can use 2-SampTInt.

9.3 Hypotheses about two population proportions

Test a hypothesis $H_0 : p_1 = p_2$.

Minitab

1. Enter raw data in C1 and C2.
2. Choose **Stat**→**Basic Statistics**→**2-Proportions**.
3. Select the appropriate “Variables” and “Options”.
4. Click “OK”.

TI Calculator

1. Press **STAT**→TESTS→2-PropZTest.
2. Enter x_1 , n_1 , x_2 and n_2 .
3. Select the appropriate alternative hypothesis, highlight “Calculate” and press **ENTER**.