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## [PART 4] “Inference: Conclusions with Confidence”

### [CHAPTER 10] “Estimating with Confidence”

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#### OUTLINE [10.1] “CONFIDENCE INTERVALS: THE BASICS”

1. STATISTICAL INFERENCE (copy entire box) page 617
  2. CONFIDENCE INTERVALS / SIGNIFICANCE TESTS
  3. COPY ENTIRE SENTENCE (page 617) “Both types of inference are based on the...”
  4. COPY ENTIRE SENTENCE (page 617) “That is, both probabilities that stat...”
  5. CAUTION! (page 617)
  6. CONFIDENCE INTERVAL and CONFIDENCE LEVEL (copy entire box) page 622
  7. CAUTION! (page 622)
  8. CONDITIONS for CONSTRUCTING a CONFIDENCE INTERVAL for  $\mu$  (copy entire box)
  9. COPY ALL OF FIGURE 10.5                      10. CRITICAL VALUES (copy entire box) page 629
  11. CONFIDENCE INTERVAL FOR A POPULATION MEAN ( $\sigma$  KNOWN) page 629 (copy entire box)
  12. INFERENCE TOOLBOX CONFIDENCE INTERVALS (copy entire box) page 631
  13. COPY ALL OF FIGURE 10.8                      14. COPY ALL OF FIGURE 10.9
  15. CAUTION! (page 635)
  16. SAMPLE SIZE FOR A DESIRED MARGIN OF ERROR (copy entire box) page 635
  17. - 24. COPY ALL CAUTIONS!! (page 636, 637)
  25. COPY ENTIRE SENTENCE (page 637) “The probability calculations of standard statistical inference describe...”
- \*\*\*\*\*READ “SECTION 10.1 SUMMARY” (page 639)
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#### OUTLINE [10.2] “ESTIMATING A POPULATION MEAN”

1. CONDITIONS FOR INFERENCE ABOUT A POPULATION MEAN (copy entire box) page 643
  2. STANDARD ERROR (copy entire box) page 643                      3. t distribution
  3. 4. DEGREES OF FREEDOM (df)                      5. z distribution
  6. FACTS ABOUT t distribution (copy 3 bullets) page 645                      7. COPY ALL OF FIGURE 10.10
  8. THE ONE-SAMPLE t INTERVAL (copy entire box) page 646
  9. COPY ENTIRE SENTENCE (page 648) “The one-sample t confidence interval has the form...”
  10. CAUTION! (page 648)                      11. PAIRED t PROCEDURES (copy entire box) page 651
  12. CAUTION! (page 653)                      13. CAUTION! (page 648)
  14. ROBUST PROCEDURES (copy entire box) page 654
  15. USING THE t PROCEDURES (copy entire box) page 655
- \*\*\*\*\*READ “SECTION 10.2 SUMMARY” (page 658, 659)
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#### OUTLINE [10.3] “ESTIMATING A POPULATION PROPORTION”

1. STANDARD ERROR OF “p-hat” (page 666)
  2. CONDITIONS FOR INFERENCE ABOUT A PROPORTION (copy entire box) page 666
  3. CONFIDENCE INTERVAL FOR A POPULATION PROPORTION (copy entire box) page 667
  4. CAUTION! (page 668)                      5. “Here are two ways to get  $P^*$  ...” (page 671)
  6. SAMPLE SIZE FOR DESIRED MARGIN OF ERROR (copy entire box) page 671
- \*\*\*\*\*READ “SECTION 10.3 SUMMARY” (page 674, 675)
- \*\*\*\*\*READ “CHAPTER REVIEW, SUMMARY” (page 677-679)
- \*\*\*\*\*READ “WHAT YOU SHOULD HAVE LEARNED” (page 679) [A1-A5, B1-B4, C1-C3]
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## [PART 4] “Inference: Conclusions with Confidence”

### [CHAPTER 11] “Testing a Claim”

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#### OUTLINE [11.1] “SIGNIFICANCE TESTS: THE BASICS”

1. COPY ENTIRE SENTENCE (page 687) “Significance tests use an elaborate vocabulary, but the basic idea is simple: ...”
  2. COPY ENTIRE SENTENCE (page 688) “The reasoning of statistical tests, like that of confidence intervals, is based on asking ...”
  3. NULL AND ALTERNATIVE HYPOTHESES (copy entire box) page 691
  4. ONE-SIDED ALTERNATIVE / TWO-SIDED ALTERNATIVE
  5. CAUTION! (page 692)                      6. CAUTION! (page 692)
  6. 7. CONDITIONS FOR SIGNIFICANCE TESTS (details for checking the Normality condition for MEANS and PROPORTIONS)    8. page 695, write the equation: the test statistic has the form...
  9. P-value (copy entire box) page 696                      10. COPY ALL OF FIGURE 11.2
  11. SIGNIFICANCE LEVEL
  12. STATISTICAL SIGNIFICANCE (copy entire box) page 699
  13. CAUTION! (page 699)
  14. COPY ENTIRE SENTENCE (page 700) “We will reject  $H_0$  if our sample result is...”
  15. CAUTION! (page 701)
- \*\*\*\*\*READ “SECTION 11.1 SUMMARY” (page 702)
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#### OUTLINE [11.2] “CARRYING OUT SIGNIFICANCE TESTS”

1. INFERENCE TOOLBOX: Significance Tests (copy entire box) page 705
  2. Z TEST FOR A POPULATION MEAN (copy entire box) page 705
  3. CAUTION! (page 707)                      4. TWO-TAILED TEST / ONE-TAILED TEST
  5. COPY ALL OF [STEP 2: CONDITIONS] page 708
  6. COPY ALL OF [STEP 4: INTERPRETATION] page 709
  7. CONFIDENCE INTERVALS AND TWO-SIDED TESTS (copy entire box) page 710
  8. DUALITY page 710                      9. CAUTION! (page 713)
  10. COPY ALL OF FIGURE 11.7
- \*\*\*\*\*READ “SECTION 11.2 SUMMARY” (page 713)
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#### OUTLINE [11.3] “USE AND ABUSE OF TESTS”

1. CHOOSING A LEVEL OF SIGNIFICANCE page 717 “But how small a P-value is convincing evidence against the null hypothesis?” [COPY BOTH BULLETS NEAR THE TOP OF THE PAGE]
  2. COPY ENTIRE SENTENCE (page 717) “Users of statistics have often emphasized...”
  3. CAUTION! (page 717)                      4. CAUTION! (page 718)
  5. CAUTION! (page 718)                      6. CAUTION! (page 719)
  7. HAWTHORNE EFFECT                      8. CAUTION! (page 720)
  9. BEWARE OF MULTIPLE ANALYSES
- \*\*\*\*\*READ “SECTION 11.3 SUMMARY” (page 721)

#### SKIP OUTLINE [11.4] FOR NOW!!!

- \*\*\*\*\*READ “CHAPTER REVIEW, SUMMARY” [SKIP TYPE I & II ERROR, & POWER] (page 736)
- \*\*\*\*\*READ “WHAT YOU SHOULD HAVE LEARNED” (page 737) [1-6, SKIP #7]
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**[PART 4] “Inference: Conclusions with Confidence”**

**[CHAPTER 12] “Significance Tests in Practice”**

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**OUTLINE [12.1] “TESTS ABOUT A POPULATION MEAN”**

1. THE ONE-SAMPLE  $t$  STATISTIC & THE  $t$  DISTRIBUTIONS (copy entire box) page 744
  2. THE ONE-SAMPLE  $t$  TEST (copy entire box) page 746
  3. COPY ALL OF “SECTION 12.1 SUMMARY” (page 762)
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**OUTLINE [12.2] “TESTS ABOUT A POPULATION PROPORTION”**

1. THE ONE-PROPORTION  $z$  TEST (copy entire box) page 766
2. EXPLAIN “large-sample test” page 767
3. CAUTION! (page 769)
4. CAUTION! (page 770)
5. COPY ALL OF “SECTION 12.2 SUMMARY” (page 770)

**\*\*\*\*\*READ “CHAPTER REVIEW, SUMMARY” (page 774)**

**\*\*\*\*\*READ “WHAT YOU SHOULD HAVE LEARNED” (page 737) [A1-A4, B1-B2]**

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**[PART 4] “Inference: Conclusions with Confidence”**

**[CHAPTER 13] “Comparing Two Population Parameters”**

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**OUTLINE [13.1] “COMPARING TWO MEANS”**

1. TWO-SAMPLE PROBLEMS (copy entire box) page 781
2. CONDITIONS FOR COMPARING TWO MEANS (copy entire box) page 782
3. THE TWO-SAMPLE  $t$  PROCEDURES (copy entire box) page 788
4. COPY THE LAST PARAGRAPH AT THE BOTTOM OF PAGE 790
5. CAUTION! (page 800)

**\*\*\*\*\*READ “SECTION 13.1 SUMMARY” (page 802, 803)**

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**OUTLINE [13.2] “COMPARING TWO PROPORTIONS”**

1. CONFIDENCE INTERVAL FOR COMPARING TWO PROPORTIONS (copy entire box) page 810
2. COMBINED SAMPLE PROPORTION (page 814)
3. SIGNIFICANCE TESTS FOR COMPARING TWO PROPORTIONS (page 815)

**\*\*\*\*\*READ “SECTION 13.2 SUMMARY” (page 820)**

**\*\*\*\*\*READ “CHAPTER REVIEW, SUMMARY” (page 826)**

**\*\*\*\*\*READ “WHAT YOU SHOULD HAVE LEARNED” (page 826, 827) [A1-A2, B1-B3, C1-C3]**

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**[PART 4] “Inference: Conclusions with Confidence”**

**[CHAPTER 14] “Inference for Distributions of Categorical Variables: Chi-Square Procedures”**

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**OUTLINE [14.1] “TESTS FOR GOODNESS OF FIT”**

1. CHI-SQUARE TEST FOR GOODNESS OF FIT (page 836)
2. ONE-WAY TABLE, CELLS
3. EXPECTED COUNT
4. DEGREES OF FREEDOM
5. TEST FOR GOODNESS OF FIT
6. THE CHI-SQUARE TEST FOR GOODNESS OF FIT (copy entire box) page 840
7. CAUTION! (page 841)
8. THE CHI-SQUARE DISTRIBUTIONS (copy entire box) page 841
9. COPY ALL OF FIGURE 14.2
10. Give the 3 properties of the chi-square density curves (page 842)
11. COMPONENT

**\*\*\*\*\*READ “SECTION 14.1 SUMMARY” (page 845, 846)**

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## **OUTLINE [14.2] “INFERENCE FOR TWO-WAY TABLES”**

1. TWO-WAY TABLE
2.  $r \times c$  table
3. EXPECTED CELL COUNTS
4. CAUTION! (page 855)
5. CHI-SQUARE STATISTIC (copy entire box) page 858
6. CHI-SQUARE TEST FOR HOMOGENEITY OF POPULATIONS (copy entire box) page 860
7. CELL COUNTS REQUIRED FOR THE CHI-SQUARE TEST (copy entire box) page 860
8. COMPONENTS (page 865)
9. CAUTION! (page 865)
10. THE CHI-SQUARE TEST OF ASSOCIATION/INDEPENDENCE (copy entire box) page 869

\*\*\*\*\*READ “SECTION 14.2 SUMMARY” (page 876, 877)

\*\*\*\*\*READ “CHAPTER REVIEW, SUMMARY” (page 880, 881)

\*\*\*\*\*READ “WHAT YOU SHOULD HAVE LEARNED” (page 881) [A1-A3, B1-B5, C1-C2]

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## **[PART 4] “Inference: Conclusions with Confidence”**

### **[CHAPTER 11] “Testing a Claim”**

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## **OUTLINE[11.4] USING INFERENCE TO MAKE DECISIONS**

1. Type I and II Errors (copy entire box) page 723
2. COPY ALL OF FIGURE 11.8
3. SIGNIFICANCE AND Type I Error (copy entire box) page 726
3. POWER AND Type II Error (copy entire box) page 729
4. List and explain 4 ways to increase the POWER (page 730)

\*\*\*\*\*READ “SECTION 11.4 SUMMARY” (page 733)

\*\*\*\*\*READ “CHAPTER REVIEW, SUMMARY” (page 736)

\*\*\*\*\*READ “WHAT YOU SHOULD HAVE LEARNED” (page 737) [1-7]

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## **[PART 4] “Inference: Conclusions with Confidence”**

### **[CHAPTER 15] “Inference for Regression”**

1. CONDITIONS FOR REGRESSION INFERENCE (copy entire box) page 891
2. CAUTION! (page 891)
3. COPY ALL OF FIGURE 15.2
4. List and describe the 4 conditions that must be checked before you do inference (page 892)
5. STANDARD ERROR ABOUT THE LEAST-SQUARES LINE (copy entire box) page 897
6. DEGREES OF FREEDOM
7. CONFIDENCE INTERVAL FOR REGRESSION SLOPE (copy entire box) page 899
8. COPY ALL OF FIGURE 15.5
9. CAUTION! (page 903)
10. SIGNIFICANCE TESTS FOR REGRESSION SLOPE (copy entire box) page 905

\*\*\*\*\*READ “CHAPTER 5 SUMMARY” (page 910, 911)

\*\*\*\*\*READ “CHAPTER REVIEW, SUMMARY” (page 912, 913)

\*\*\*\*\*READ “WHAT YOU SHOULD HAVE LEARNED” (page 913) [A1-A2, B1-B3, C1-C3]

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