SPRING 2014 : STAT - 1 , Section 10.

Selected topics from Chapters 9, 10 and 11

- Read Chapter Objectives. We cover Sections 9.1 to 9.5 (p.358 to p.399). Technical terms are *Null Hypothesis − H_0, Alternative Hypothesis − H_a, Hypothesis test (p.359), two-tailed test, left-tailed test, right-tailed test, one-tailed test (p.360), Type I Error, Type II Error (p.362), Significance Level − α (p.363), Rejection region, Non-rejection region, Critical value(s) (p.369), Critical value approach (p.368 to 371, Table 9.5 (p.371)), P−value (p.374), P−value approach (p.372 to p.377, Table 9.7 (p.377)), One−mean z−test (p.380), and One-mean t−test (p.394).*

- Read carefully about choosing H_0 and H_a (p.360 to 361). The logic of Hypothesis testing and the role of Type I Error, α follow leading to Key Fact 9.2 about conclusions of a hypothesis test.
  TRY 9.5, 9.6, 9.7, 9.9, 9.10, 9.13, 9.14, 9.15.

- The critical value approach is illustrated in Example 9.5. Learn the terminology. Go over Figure 9.3 and Table 9.3 on p.369. Steps involved in the critical value approach are given in Table 9.5 (p.371).
  TRY ALL problems in Exercises 9.2 (p.271 to 372).

- After defining $P-$value (Definition 9.5) and stating Key Fact 9.6 (p.375), Examples 9.8 and 9.9 show how to find the $P-$values; Table 9.7 (p.377) summarizes the $P-$value approach. Guidelines to use $P-$values is given on Table 9.8 (p. 378).
  TRY 9.49, 9.51, 9.53, 9.55, 9.57.

- Sections 9.4 and 9.5 form the core of Chapter 9. In 9.1 Key Fact 9.7 (p.379) gives the guidelines to use the One-mean $z-$test and Procedure 9.1 (p.380) describes how to carry out the one sample $z-$test. Go over the three examples that follow to master the techniques.
  TRY 9.73, 9.75, 9.77.

- When σ is not known, we use the one sample $t-$test for hypothesis concerning μ. In Section 9.5, Procedure 9.2 (p.394) shows how to carry out the one sample $t-$test illustrated by Example 9.16.
  TRY 9.89, 9.91, 9.93, 9.95, 9.97, 9.99, 9.101, 9.103, 9.105.

- We go to Chapter 11 to understand how to find CI and carry out tests of hypothesis for a population proportion p. The sample proportion $\hat{p}$ (Formula 11.1, p.514), its sampling distribution (Key Fact 11.1, p.515) lead us to use the one proportion $z-$interval procedure (Procedure 11.1, p.516). Go over Example 11.3, Margin of Error for estimating p (Definition 11.2, p.517), Sample size formula for estimating p (Formula 11.2, p.518), Example 11.4.
  TRY 11.13, 11.15, 11.23, 11.27.

- The one-proportion $z-$test is discussed in Section 11.2. Procedure 12.2 (p.526) describes it with Example 11.6 illustrating it.
  TRY 11.65, 11.67, 11.69.

- We go back to Chapter 10 to discuss inferences on two population means. We cover sections 10.1, 10.2 and 10.5. See Figure 10.1 (p.436) and Table 10.4 (p.437) to understand the setting of two samples from two populations. Key Fact 10.1 describes the sampling distribution of the difference between two sample means $(\overline{x}_1 - \overline{x}_2)$. We use this in Section 10.2 to consider the case when we have two *independent samples* from two populations with equal population standard deviations. We first derive in this case the estimate s_p(the pooled sample standard deviation, p.440) and the Pooled $t-$statistic (Key Fact 10.2, p.440). Procedure 10.1 (p.441) outlines the *Pooled $t-$test* illustrated by Example 10.3 and the Pooled $t-$interval procedure (Procedure 10.2, p.445) illustrated by Example 10.4.
  TRY 10.29 to 10.32, 10.33, 10.35, 10.39, 10.43, 10.45, 10.49.

- We go to Section 10.5. Here we compare two means using a *paired sample*. The paired $t-$statistic (Key Fact 10.6, p.480) leads us to the Paired $t-$test (Procedure 10.6, p.481) and Paired $t-$interval (Procedure 10.7, p.483). Go over Examples 10.14, 10.15, 10.16 and 10.17.
  TRY 10.143, 10.145, 10.149, 10.151.

- AT LAST *(finally!)*, we go to Section 11.3 and cover Two-proportions $z-$test (Procedure 11.3, p.533) and Two-proportions $z-$interval procedure (procedure 11.4, p.535). Go over Examples 11.9 and 11.10.
  TRY 11.89, 11.91, 11.93, 11.95, 11.97, 11.99.

- Read about "A principal founder of modern Statistical Theory" (p.431) and "Spreading the Gospel according to St. Gertrude", (p.510).