

## 15.3.10: Chapter 11 Lab

### Two Population Hypothesis Testing

Open MINITAB file lab10.mpj from the website.

The National Basketball Association (NBA) announced that a new basketball would be used for the 2006–2007 season. Here is the announcement from the NBA about the new ball:

The NBA is introducing a new Official Game Ball for play beginning in the 2006–07 season. The new synthetic ball, manufactured by Spalding, features a new design and a new material that together offer better grip, feel, and consistency than the current leather ball. This marks the first change to the ball in over 35 years and only the second in 60 seasons.

Players in the NBA complained about the new ball, saying the ball reduced their performance. The NBA announced that the traditional leather ball would be used again beginning January 1, 2007.

For the following 4 problems, analyze data from NBA games that show the home team score and visiting team score for games played with the original leather ball and with the new synthetic ball. You will then conduct the following hypothesis tests. Make sure you show all steps:

1. Test for a difference in Standard deviation in home team score due to the type of ball.
  - a. State  $H_o$  and  $H_a$ .
  - b. State the model used and the assumptions needed.
  - c. Conduct the test at a significance level of 5% - paste results.
  - d. State the decision (Reject or Fail to Reject  $H_o$ ).
  - e. State the appropriate conclusion in the context of the original problem.
2. Test for a difference in mean home team score due to the type of ball.
  - a. State  $H_o$  and  $H_a$ .
  - b. Is this model independent or dependent sampling? Explain.
  - c. State the model used and the assumptions needed. Use the  $F$ -test from question 1 if you have independent sampling.
  - d. Conduct the test at a significance level of 5% - paste results.
  - e. State the decision (Reject or Fail to Reject  $H_o$ ).
  - f. State the appropriate conclusion in the context of the original problem.
  - g. Make grouped box plots of the home score by type of ball. Is the graph consistent with your decision?
3. Test for a difference in mean visiting team score due to the type of ball.
  - a. State  $H_o$  and  $H_a$ .
  - b. Is this model independent or dependent sampling? Explain.
  - c. State the model used and the assumptions needed. You will need to conduct the  $F$ -test if you have independent sampling.
  - d. Conduct the test at a significance level of 5% - paste results.
  - e. State the decision (Reject or Fail to Reject  $H_o$ ).
  - f. State the appropriate conclusion in the context of the original problem.
  - g. Make grouped box plots of the visiting score by type of ball. Is the graph consistent with your decision?
4. Test for a mean difference in scores between home team and visiting team.
  - a. State  $H_o$  and  $H_a$ .
  - b. Is this model independent or dependent sampling? Explain.
  - c. State the model used and the assumptions needed. You will need to conduct the  $F$ -test only if you have independent sampling.
  - d. Conduct the test at a significance level of 5% - paste results.
  - e. State the decision (Reject or Fail to Reject  $H_o$ ).
  - f. State the appropriate conclusion in the context of the original problem.

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