Statistics 101 – More Examples of Tests of Hypotheses

1. An airline claims that the airline rarely loses a passengers checked luggage. In addition, if checked luggage is lost, 90% of the time lost luggage is recovered and returned to the owner within 24 hours. A consumer group believes that actually less than 90% is recovered within 24 hours. The consumer group surveys a large random sample of the airline's customers and found that 103 of 122 people who had lost checked luggage were reunited with the missing items within 24 hours. Does this sample data cast doubt on the airline's claim of 90% recovered and returned within 24 hours? To answer this question you should

   a) Set up a null and alternative hypotheses. Be sure to state what p represents in your hypotheses.

   b) Verify that the success/failure condition is satisfied.

   c) Calculate the value of the test statistic and convert this to a P-value using Table Z.

   d) Use the P-value to make a decision whether or not to reject the null hypothesis.

   e) State a conclusion, within the context of the problem, which addresses the airline's claim.

2. In the 1980's it was generally believed that about 5% of all children in the U. S. were affected by congenital abnormalities. Some people believe that the increase in chemicals in the environment has led to an increase in the proportion of children in the U. S. with congenital abnormalities. A recent study examined 384 randomly selected children in the U. S. and found that 26 had congenital abnormalities. The conditions for doing a test of hypothesis are met, so you do not need to verify them.

   a) What is the population? Be specific.

   b) What is the sample? Be specific.

   c) What is the population parameter of interest?

   d) Give a null and alternative hypothesis for the population parameter.

   e) Compute the value of the test statistic and convert this to a P-value.

   f) Use the P-value to make a decision whether or not to reject the null hypothesis.

   g) State a conclusion, within the context of the problem.