1. Environmental concerns often conflict with modern technology, as is the case with birds that pose a hazard to aircraft during takeoff. An environmental group states that incidents of bird strikes are too rare to justify killing the birds. A pilots’ group claims that among aborted takeoffs leading to an aircraft’s going off the end of the runway, at least 10% are due to bird strikes. Use a 0.05 level of significance to test that claim. Sample data consist of 74 aborted takeoffs in which the aircraft overran the runway. Among those 74 cases, 5 were due to bird strikes (based on data from the Air Line Pilots Association and Boeing, as reported in USA Today).

2. In 1990, 5.8% of job applicants who were tested for drugs failed the test. At the 0.01 level, test the claim that the failure rate is now lower if a random sample of 1520 current job applicants results in 58 failures (based on data from the American Management Association). Does the result suggest that fewer job applicants now use drugs?

3. Ralph Carter is a high-school history teacher who says that if students are not aware of the Holocaust, then the curriculum should be revised to correct that deficiency. A Roper Organization survey of 506 high-school students showed that 268 of them did not know that the term “Holocaust” refers to the Nazi killing of about 6 million Jews during World War II. Using the sample data and a 0.05 significance level, test the claim that most (more than 50%) students don’t know what “Holocaust” refers to. Based on these results, should Ralph Carter seek revisions to the curriculum?

4. A television executive claims that “fewer than half of all adults, are annoyed by the violence shown on television.” Test this claim by using sample data from a Roper poll in which 48% of 1,998 surveyed adults indicated their annoyance with television violence. Use a 0.05 significance level.

5. In one study of 71 smokers who tried to quit smoking with nicotine patch therapy, 32 were not smoking one year after the treatment (based on data from “High-Dose Nicotine Patch Therapy,” by Dale et al., Journal of the American Medical Association, Vol. 274, No. 17). Use a 0.10 level of significance to test the claim that among smokers who try to quit with nicotine patch therapy, the majority are smoking a year after the treatment. Do these results suggest that the nicotine patch therapy is not effective?

6. It is claimed that 60% of all 18-25-year-olds have used alcohol in the past 30 days. A survey of 125 students on campus who are between the ages of 18 and 25 showed that 83 have used alcohol in the past 30 days. Test the claim at the 5% level of significance and use the classical approach.

7. It has been claimed that at least 2 out of every 3 pet owners allow their pets to sleep in bed with them. A survey of 295 pet owners at a local pet shop showed that 186 of them allowed their pet to sleep in bed with them. At the 5% level of significance, test the claim that at least 2/3 of all pet owners allow their pets to sleep in bed with them.

8. A random sample of 118 adult women revealed that 70 were satisfied with their weight. At the 2% level of significance, test the claim that more than half of all adult women are satisfied with their weight.

Best of Luck!

Steve
1. \( H_0 : \pi \geq 0.1 \)
\( H_A : \pi < 0.1 \)

\( TS = -0.93 \)
\( CV = \pm 1.645 \)

Fail to Reject \( H_0 \)

We cannot reject the pilots’ claim that at least 10% of the aborted takeoffs are due to bird strikes.

2. \( H_0 : \pi \geq 0.058 \)
\( H_A : \pi < 0.058 \)

\( TS = -3.31 \)
\( CV = -2.325 \)

Reject \( H_0 \)

The study seems to suggest that fewer applicants now use drugs.

3. \( H_0 : \pi \leq 0.5 \)
\( H_A : \pi > 0.5 \)

\( TS = 1.33 \)
\( CV = 1.645 \)

Fail to Reject \( H_0 \)

There seems to be sufficient evidence to seek a curriculum revision.

4. \( H_0 : \pi \geq 0.5 \)
\( H_A : \pi < 0.5 \)

\( TS = -1.79 \)
\( CV = -1.645 \)

Reject \( H_0 \)

There seems to be sufficient evidence to claim that fewer than half of all adults are annoyed by violence on television.

5. \( H_0 : \pi \leq 0.5 \)
\( H_A : \pi > 0.5 \)

\( TS = 0.83 \)
\( CV = 1.28 \)

Fail to Reject \( H_0 \)

There is insufficient evidence to suggest that the nicotine patch therapy is ineffective.

6. \( H_0 : \pi = 0.6 \)
\( H_A : \pi \neq 0.6 \)

\( TS = 1.46 \)
\( CV = \pm 1.96 \)

Fail to Reject \( H_0 \)

There is insufficient evidence to suggest that the percentage of 18-25 years-olds who used alcohol in the last 30 days is different that 60%.

7. \( H_0 : \pi \geq \frac{2}{3} \)
\( H_A : \pi < \frac{2}{3} \)

\( TS = -1.32 \)
\( CV = -1.645 \)

Fail to Reject \( H_0 \)

There is insufficient evidence to suggest that less than 2/3 of pet owners allow their pets to sleep in bed with them.

8. \( H_0 : \pi \leq 0.5 \)
\( H_A : \pi > 0.5 \)

\( TS = 2.03 \)
\( CV = 2.055 \)

Fail to Reject \( H_0 \)

There is insufficient evidence to suggest that more than half the women are satisfied with their weight.