Which test should I use?

*Sample vs. proportion*

* “sample” compares averages (average and standard deviation given)
* “proportion” compares percents

*One vs. two*

* “One” compares actual with expected
* “Two” compares two separate groups

Giveaways—what to look for:

One-sample t-test

* One SMALL sample
* Problem asks about average

One-sample z-test

* One BIG sample
* *σ* is given
* “According to the U.S. Census…”
* Problem asks about average

Two-sample t-test

* Two samples
* Is one average bigger than the other?
* 2 averages and 2 S.D.s are given

One-proportion z-test

* Is a percent larger or smaller than expected?
* Look for “%” or “out of”

Two-proportion z-test

* Is one percent larger than another percent?
* Two groups (men/women, etc.)
* Look for “%” or “out of”

Standard Deviation X2 Test

* Is the S.D. too large
* Is the data too spread out?
* The question asks about standard deviation
* There is only 1 sample, but 2 S.D.s

Categorical X2 Test

* More than 2 categories
* Count up how many in each

Matrix X2 Test

* Information is (or can be) in a table
* Counting up number in each place in the table

Correlation r-Test

* Words like “increase” and “decrease”
* As one thing happens, …

**Which Test Should I Use?**

**\_\_\_\_\_\_\_\_\_\_1.** A music store believes that the distribution of music they sell on CD (rock, rap, alternative, country, classical, etc.) is different from the distribution they distribute via downloads. They make a table to record what types of music are sold in different formats.

 **A.** **2-sample t-Test C. Matrix** $χ^{2}$**Test**

 **B. 2-proportion z-Test D. Correlation r-Test**

**\_\_\_\_\_\_\_\_\_\_2.** According to the U.S. Census, the average age of all Americans is 34.2, with a standard deviation of 12.1 years. You think that the average age of people in Whittemore is older than that.

 **A.** **1-sample z-Test C. Correlation r-Test**

 **B. 1-sample t-Test D. 1-proportion z-Test**

**\_\_\_\_\_\_\_\_\_\_3.** A salesman has a quota of selling 20 pairs of shoes per day. His supervisor takes a sample of 12 days and finds the average and standard deviation. He wants to see if the salesman’s average sales are significantly below the quota.

 **A.** **2-sample t-Test C. 1-sample t-Test**

 **B. 1-proportion z-Test D. 1-sample z-test**

**\_\_\_\_\_\_\_\_\_\_4.** On average, it takes 2 hours for a drug to disperse throughout a patient’s blood system. The standard deviation is supposed to be 5 minutes. A new version of the drug is tested on 200 patients. It was found that the average time for the drug to disperse was 1 hour, 50 minutes. The researcher wants to see if this is significantly faster than it has been in the past.

 **A.** **1-sample t-test C. 1-sample z-Test**

 **B. Categorical** $χ^{2}$**Test D. 1-proportion z-Test**

**\_\_\_\_\_\_\_\_\_\_5.** Chevy claims that its cars get better gas mileage, on average, than Ford’s cars do. *Consumer Reports* takes samples of the gas mileage from both lines of cars, and they figure the average and standard deviation for both Chevy and Ford.

 **A.** **2-sample t-Test C. 2-proportion z-Test**

 **B. 1-sample t-test D. Matrix** $χ^{2}$**Test**

**\_\_\_\_\_\_\_\_\_\_6.** A social scientist believes that drug use is highest in low-income neighborhoods. She wants to find out whether drug use goes up as family income goes down.

 **A.** **1-sample z-Test C. Correlation r-Test**

**B. Categorical** $χ^{2}$**Test D. 2-proportion z-test**

**\_\_\_\_\_\_\_\_\_\_7.** An insurance company has records for all its customers showing that 40% of all claims for doctor’s office visits are “small”, 45% are “moderate” and 15% are “large”. They take a sample of recent claims at the local medical clinic and find that 60 were “small”, 180 were “moderate”, and 60 were “large”. They believe the distribution of claims at the local clinic is too heavy on moderate and large claims, and they want to test to see if they can remove the clinic from their “preferred provider” list.

 **A.** **Correlation r-test C. Categorical** $χ^{2}$**Test**

 **B. 1-sample t-Test D. 2-sample t-Test**

**\_\_\_\_\_\_\_\_\_\_8.** The NASDAQ exchange advertises that it is “the market of the future” and implies that the companies it lists do better than the more traditional New York Stock Exchange. To test this out, you take a sample of stocks from each exchange and record the mean and the standard deviation.

 **A.** **2-proportion z-Test C. 2-sample t-Test**

 **B. Categorical** $χ^{2}$**Test D. Matrix** $χ^{2}$**Test**

**\_\_\_\_\_\_\_\_\_\_9.** Zach was recently denied admission to the Florence Nightengale School of Nursing. He believes he is fully qualified and that the school discriminated against him because he was a man. He does some research and finds out that 23% of the applicants to Florence Nightengale are men. He wants to see if the percentage of males among the applicants who are accepted is significantly less than 23%.

 **A.** **1-sample t-Test C. 1-proportion z-Test**

 **B. 2-sample t-Test D. 2-proportion z-Test**

**\_\_\_\_\_\_\_\_\_\_10.** Shortly after the first O.J. Simpson trial, *Time* magazine surveyed both blacks and whites around the country. Only 40% of 1,200 whites surveyed felt the “not guilty” verdict was correct. On the other hand, out of 400 blacks surveyed, 73% felt it was the correct verdict. *Time* reported that there was a significant difference in the percentage of blacks and whites who felt the jury gave the correct verdict.

 **A.** **2-sample t-Test C. 1-sample z-Test**

 **B. 2-proportion z-Test D. 1-proportion z-Test**

**\_\_\_\_\_\_\_\_\_\_11.** In the early 1990s, the New York City Transit Commission made a major push to clean up the New York subway. They noticed that as the number of graffiti-covered cars went down, so did the number of crimes committed on the trains.

 **A.** **Correlation r-Test C. 2-sample t-Test**

 **B. Matrix** $χ^{2}$**Test D. 2-proportion z-Test**

**\_\_\_\_\_\_\_\_\_\_12.** Julie works at the McDonalds in Spencer. She reads in a company brochure that 72% of customers order fries with their meal. She wants to know if the percentage who order fries in Spencer is higher than that.

 **A.** **2-proportion z-test C. Matrix** $χ^{2}$**Test**

##  B. 1-sample z-Test D. 1-proportion z-Test

**\_\_\_\_\_\_\_\_\_\_13.** Iowa Lakes wants to know if their student body truly represents the area they serve. They find out what percentage of the population of the region lives in Clay, Dickenson, Palo Alto, Emmet, and Kossuth Counties, and then they look at how many students come from each of those counties. They want to know if the distribution of students is different from what would normally be expected.

 **A.** **2-Proportion z-Test C. Matrix** $χ^{2}$**Test**

 **B. Categorical** $χ^{2}$**Test D. Correlation r-Test**

**\_\_\_\_\_\_\_\_\_\_14.** A salesman has a quota of selling 20 pairs of shoes per day. His supervisor believes the salesman is below his quota more often than he is above it.

 **A.** **2-sample t-Test C. Matrix** $χ^{2}$**Test**

 **B. Correlation r-Test D. Sign Test**

**\_\_\_\_\_\_\_\_\_\_15.** A university is investigating a professor for sexist grading policies. One of the things they do as part of their investigation is to compare the grade distribution for men and women in the professor’s classes. They organize their data in the following table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | F |
| Men |  |  |  |  |  |
| Women |  |  |  |  |  |

 **A.** **2-Sample t-Test C. Matrix** $χ^{2}$**Test**

##  B. 2-Proportion z-Test D. Correlation r-Test

**\_\_\_\_\_\_\_\_\_\_16.** An insurance company wants to see if their suggested hospital stay for a certain kind of surgery is in line with doctors’ current thinking. They ask a large sample of several hundred doctors their opinion on the appropriate length of stay and see if the average of the doctors’ is different than the current stay the insurance company suggests.

 **A.** **1-sample z-Test C. 1-proportion z-test**

 **B. 1-sample t-Test D. 2-proportion z-test**

**\_\_\_\_\_\_\_\_\_\_17.** One day a convenience store clerk counts how many customers pay with cash and how many use electronic payments to see if the percent that use electronic payments is significantly more than 50%.

 **A.** **1-Sample t-Test C. 1-proportion z-Test**

##  B. 2-Sample t-Test D. Correlation r-Test