

statistics ... BUSINESS statistics

Telling things apart

Which method of gathering data is used in each example below?

- A. census
- B. experiment

- C. sampling
- D. simulation

1. *General: Gathering Data* Which technique (sampling, experiment, simulation, or census) for gathering data do you think was used in the following studies?
- _____ a. (a) One way to find information on the Super Bowl football game is to look at the NFL web site. Visit the Brase/Brase statistics site at <http://math.college.hmco.com/students> and find the link to the NFL site. Explore the Super Bowl results. There the winning scores for all the Super Bowl games played to date are given. Using the data for all the games, find the average score for the winning teams.
 - _____ b. (b) A sample of 82 healthy female and male subjects was recruited to participate in a study on pain (*Physical Therapy*, Vol. 70, No. 1). The subjects were divided into two groups. The experimental group received laser stimulation, and the control group received sham stimulation. Tests of pain tolerance were then conducted on each group.
 - _____ c. (c) Computer imaging of runners shows the effect of stride length on running efficiency.
 - _____ d. (d) Do the Chinese like chocolate? Gallup Chinese is conducting surveys in China to answer the question for the U.S. Chocolate Manufacturers Association. Gallup Chinese is surveying a portion of the Chinese population to determine whether there is a market for chocolate in China (*Wall Street Journal*).
- _____ 2. In half of its stores, Hy-Vee puts a shelf of salad dressing in the produce area next to the lettuce. In the rest of its stores, Hy-Vee has salad dressing only in the canned goods area. They want to see if putting in the new display increases sales of salad dressing.
- _____ 3. To see what candidate people voted for in an election, the TV networks interview people in 500 key precincts around the country.
- _____ 4. The U.S. Olympic Training Center makes uses computer models to find the most efficient form for athletes to use in every sport.
- _____ 5. A hotel gathers information on every one of their guests so they can determine what kinds of people stay there.
- _____ 6. A teacher plays classical music in some of her classes to see if the kids are better behaved than in the classes where she doesn't play the music.
- _____ 7. The University of Oregon created models of ocean waves in the Pacific to investigate the likelihood of a tsunami hitting the northwestern United States.
- _____ 8. You want to know what the most popular flavors of pop are, so you observe people at the vending machine one night during the break in Statistics class and record what kind of pop each person buys.


Which type of sample is represented by each of these examples?

- A. cluster sample
- B. convenience sample
- C. random sample
- D. stratified sample
- E. systematic sample

- _____ 9. When people eat at Panera restaurants, the receipt has a toll-free number. Any customer who wants to can call the number to take a survey about their dining experience.
- _____ 10. Airport screeners are required by the Department of Homeland Security to make every twelfth passenger in line step aside for additional questioning.
- _____ 11. Minor league baseball players are periodically tested for drug use. Before each game, all the players sign their names on slips of paper. After the game the umpire draws two of those pieces of paper, and the players whose names are on them must be tested.
- _____ 12. McDonalds is considering adding a new sandwich to their menu. To see if people like it, the product is introduced at every McDonalds restaurant in Minnesota.
- _____ 13. At a liquor store, the cash register is set to require the cashier to ask every fifth customer for identification. (The sample is those customers who are carded.)
- _____ 14. When Iowa Lakes forms a student advisory committee, they make sure to include students from Emmetsburg, Estherville, Algona, Spirit Lake, and Spencer in approximately the same percentage as the enrollment on each campus.
- _____ 15. A car dealer has a "lucky seven" sale. Each customer rolls two dice. If they roll a "7", they get an additional discount off the price of their new car. The sample is the people who receive the special discount.
- _____ 16. The LAPD vice squad wants to crack down on men who solicit prostitutes in Los Angeles. They give their Hollywood precinct a quota of arresting twenty men for solicitation. The Hollywood precinct sends out a young female officer as a decoy. On Saturday night she stands by a lamp post on Sunset Boulevard, a couple blocks from the station. The first twenty men who make her an offer are arrested.

Which type of data is represented by each of these examples?

- A. interval data
- B. nominal data
- C. ordinal data
- D. ratio data

- _____ 17. A dietician notes how many calories are in a single serving of different foods.
- _____ 18. A movie reviewer rates each movie by either giving a definite thumbs up, a closed hand (meaning OK, but no big deal), or a definite thumbs down .
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- _____ 19. A waitress keep track of which type of dressing (French, ranch, bleu cheese, Thousand island, or vinaigrette) each customer wants with their salad.
- _____ 20. The Hallmark store divides its cards into categories such as "birthday", "anniversary", "get well", "sympathy", etc.
- _____ 21. A survey asks people what year they graduated from high school.
- _____ 22. A restaurant keeps track of whether customers order their steaks rare, medium rare, medium, medium well, or well done.
- _____ 23. The technology center looks at how much storage space each student uses on the computer server.