

1. In late 1995, a Gallup survey reported that Americans approved sending troops to Bosnia by 46 to 40 percent. The poll did not mention that 20,000 U.S. troops were committed to go. A CBS News poll, mention the 20,000 figure and got the opposite outcome – a 58 to 33 percent disapproval rate. Briefly explain why the mention of the number of troops would cause such a big difference in the poll results. Write the name for the kind of bias that is at work here.
2. A church group interested in promoting volunteerism in a community chooses a SRS of 200 community addresses and sends members to visit these addresses during weekday working hours and inquire about the residents' attitude toward volunteer work. Sixty percent of all respondents say that they would be willing to donate at least an hour a week to some volunteer organization. Bias is present in this sample design. Identify the type of bias involved and state whether you think the sample proportion obtained is higher or lower than the true population proportion.
3. A club contains 30 students and 10 faculty members. The students are

Abel	Fisher	Huber	Moran	Reinmann
Carson	Golomb	Jimenez	Moskowitz	Santos
Chen	Griswold	Jone	Neyman	Shaw
David	Hein	Kiefer	OBrien	Thompson
Deming	Hernandez	Klotz	Pearl	Utz
Elashoff	Holland	Liu	Potter	Vlasic

and the faculty members are

Andrews	Fernandez	Kim	Moore	Rabinozitz
Besicovitch	Gupta	Lightman	Phillips	Yang

The club can send four students and two faculty members to a convention and decides to choose those who will go by random selection.

- (a) What is the name of the sampling process that will randomly select four students and two faculty members?
 - (b) Use the Table of Random Digits beginning at Line **115** to choose a sample of **4** students, and begin at line **120** to select the **2** faculty members.
4. A medical study of heart surgery investigates the effect of a drug called a beta-blocker on the pulse rate of the patient during surgery. The pulse rate will be measured at a specific point during the operation. The investigators will use 20 patients facing heart surgery as subjects. You have a list of these 20 patients, numbered 1 to 20, in alphabetical order.
 - (a) Outline as an algorithm (paragraph form) **or** in diagram form a randomized experimental design for this study.
 - (b) Use the random digit table starting at line **125** to carry out the randomization required by your design and report the result.

5. A university's financial aid office wants to know how much it can expect students to earn from summer employment. This information will be used to set the level of financial aid. The population contains 3,478 students who have completed at least one year of study but have not yet graduated. A questionnaire will be sent to an SRS of 100 of these students, drawn from an alphabetized list.
 - (a) Describe how you will label the students in order to select the sample.
 - (b) Use Table B, beginning at line 105, to select the first five students in the sample.

6. You're in college now, and you want to investigate the attitudes of students at your school toward the faculty's commitment to teaching. The Student Government will pay the costs of contacting about 500 students.
 - (a) Specify the exact population for your study; for example, will you include part-time students?
 - (b) Describe your sample design. Will you use a stratified sample?
 - (c) Briefly discuss the practical difficulties that you anticipate; for example, how will you contact the students in your sample?

7. **Will taking Antioxidants help prevent colon cancer?** People who eat lots of fruits and vegetables have lower rates of colon cancer than those who eat little of these foods. Fruits and vegetables are rich in "antioxidants" such as vitamins A, C, and E. Will taking antioxidants help prevent colon cancer? A clinical trial studied 864 people who were at risk of colon cancer. The subjects were divided into four groups: daily beta carotene, daily vitamins C and E, all three vitamins every day, and daily placebo. After four years, the researchers were surprised to find no significant difference in colon cancer among the groups.
 - (a) Outline the design of the experiment.
 - (b) Assign labels to the 864 subjects and use Table B, starting at line 118, to choose the first 5 subjects for the beta carotene group.
 - (c) The study was double-blind. What does this mean?
 - (d) What does "no significant difference" mean in describing the outcome of the study?
 - (e) Suggest some lurking variables that could explain why people who eat lots of fruits and vegetables have lower rates of colon cancer.