Exercise Set #13
Answers to Odd-Numbered Exercises

13-1 (a) This is an example of descriptive statistics, because information is simply being reported without making any conclusions.

(b) This is an example of inferential statistics, because a conclusion about the population consisting of all customers who patronize the restaurant is made from the sample consisting of 150 customers surveyed.

(c) This is an example of inferential statistics, because a conclusion about the population consisting of the entire senior class is made from the sample consisting of 24 high school students in a senior mathematics class.

(d) This is an example of descriptive statistics, because information is simply being reported without making any conclusions.

13-3 (a) This could reasonably be considered random sampling, since there is a strong effort to insure that each item on the list will have an equal chance of being selected.

(b) This could not really be considered true random sampling, since each item does not have an equal chance of being selected.
13-5 (a) The names on the roster would be distinctly assigned one of the three-digit labels 001, 002, 003, ..., 435. Reading the first three digits of each set of five digits in the 21st row of the second page of Table A.1, the labels of the selected students are 287, 400, 206, 138, 230, 172, 288, 353, 407, 108, 311, 110, 108, 365, 032.

(b) To select a systematic random sample of size $n = 15$, we first randomly select one of the first $k = N / n = 435 / 15 = 29$ names. We select a random integer from 1 to 29 in order to determine the first name selected; we then select this first random name and every 29th name thereafter.

(c) To select a systematic random sample of size $n = 10$, we first randomly select one of the first $k = N / n = 435 / 10 = 43.5$ or 44 names. We select a random integer from 1 to 44 in order to determine the first name selected; we then select this first random name and every 44th name thereafter; if we do not get $n = 10$, we could go to the beginning of the list to finish.
13-7 (a) The sampling frame is in alphabetical order, but this can be considered random order with regard to age of licensed drivers; consequently, a **systematic sample** can be expected to be as good as a **simple random sample** at representing the population.

(b) Since the sampling frame is ordered by date of birth, it will be ordered by age. When the sampling frame is in ascending or descending order, a **systematic random sample** can be expected to be a little better than a **simple random sample** at representing the population.

(c) Since the sampling frame is ordered by year of the automobile primarily driven, then ordered by date of birth, a cyclical ordering is likely to be present. When the sampling frame has a cyclical ordering, a **systematic random sample** might be a little better, as good as, or worse than a **simple random sample** at representing the population.

13-9 (a) This should be close to a **uniform distribution**, since each of the digits from 0 to 9 are equally to occur on each spin.

(b) This should be close to a **bell-shaped distribution**, since the average for a set of 10 digits is most likely to be close to 4 or 5 and least likely to be close to 0 or 9.