CHAPTER 7

FILL-IN-THE-BLANK ITEMS

Introduction

(1) _______________, _______________ are guesses about populations based on sample results. Although we can never be certain that our guesses are correct, (2) _________________ theory will help us determine the degree of certainty we have in our conclusions. The essence of inferential statistics is in using sample (3) _________________ to attach a probability to the estimates of (4) _________________ parameters.

Thinking About Probability

One intuitive idea about probability is called (5) _________________ _________________, the mistaken belief that the probability of an event changes with a long string of the event. Formally, (6) _________________ is defined as the proportion of times an event would occur if the chances for occurrence were infinite. In other words, the probability of an event is equal to the number of times the event can occur divided by the number of ways (7) _________________ event can occur.

Probability and the individual

In terms of what will happen to you personally, probabilities should be considered long-run (8) _________________, and not (9) _________________.

Theoretical probability; Real-world probability

(10) _________________ probability is the way events are supposed to work in terms of formal probability theory. Probabilities based on past behavior and counting are called real-world, or (11) _________________ probabilities, and these are the basis for many assessments of chance that affect our lives. This type of probability is sometimes called (12) _________________ probability because the occurrence of events has been tallied relative to the number of opportunities for the event to occur.

Subjective probability

Probabilities based on our own perspectives are called (13) _________________ or (14) _________________ probabilities. Such probabilities are used in an area called (15) _________________ statistics. The classical approach to (16) _________________ tells us to make our decision about our experiment's outcome on the basis of the data, without making any prior assumptions. The (17) _________________ approach, on the other hand, would have us use the data from our experiment to adjust our prior beliefs. The weak point of this approach is that prior probabilities may be (18) _________________, and experimenters could reach different (19) _________________ from the same data if they started with different prior beliefs.

Rules of Probability

The addition rule

For mutually exclusive, random events, the probability of either one event or another event is the (20) _________________ of the probabilities of the individual events. This is called the (21) _________________ rule of probability. The formula for the rule is as follows: p(A or B) = (22) _________________.

The multiplication rule

The (23) _________________ rule states that the probability of two or more independent events occurring on separate occasions is the product of their individual probabilities. The rule is shown symbolically as follows: (24) _________________ = _________________.

Events are (25) _________________ if the occurrence of one event does not alter the probability of any other event. (26) _________________ _________________ is the probability of an event given that another event has already occurred, expressed symbolically by (27) _________________. The multiplication rule for independent events can be modified to include nonindependent events. Thus, the probability for events A and B, where the probability of B depends on A, is found with this formula: $p(A, B)$ = (28) _________________.

More on conditional probabilities

(29) _________________ probability can help us assess probabilities of events in our world by providing a way to add information to probabilities we already know. On an intuitive level, if $p(B|A) = p(B)$, then the occurrence or nonoccurrence of (30) _________________ has nothing to do with the occurrence of (31) _________________.

Bayesian statistics

Thomas Bayes initiated using (32) _________________ to help establish a mathematical basis for statistical inference. The Bayesian approach to probability and statistics is (33) _________________, and it has not been widely adopted.

The Binomial Probability Distribution

The binomial distribution is based on events for which there are only (34) _________________ possible outcomes on each occurrence. Two important features of the binomial distribution are that (a) when $p = .5$, the distribution is (35) _________________, and, as N (the number of trials) increases in value, the distribution more closely approximates the (36) _________________ _________________ _________________.