

1. Suppose 6% of cereal boxes filled by a particular machine are underweight.
 - (a) In a sample of two-hundred boxes, how many boxes can be expected to be underweight?
 - (b) In a sample of two-hundred boxes filled by this machine, what is the probability that ten or fewer are underweight?
 - (c) In a sample of six-hundred boxes, how many boxes can be expected to be underweight?
 - (d) In a sample of six-hundred boxes, what is the probability that more than fifty boxes are underweight?
 - (e) In a sample of five-hundred boxes, how many boxes can be expected to be underweight?
 - (f) In a sample of five-hundred boxes, what is the probability that thirty-five or fewer are underweight?
 - (g) In a sample of one-hundred-eighty boxes, how many boxes can be expected to be underweight?
 - (h) In a sample of one-hundred-eighty boxes, what is the probability that between twelve boxes and twenty boxes are underweight?

2. You toss a fair coin 5000 times.
 - (a) What is the expected number of times that the coin will land head side up?
 - (b) What is the probability that between the coin lands tail side up exactly 2500 times?
 - (c) What is the probability that the coin lands head side up at least 2500 times?
 - (d) What is the probability that the coin lands head side up no more than 2500 times?

3. Based on its market research, the account executive in charge of the Golden Mechanical Pencil advertising account believes that 40% of all consumers prefer Golden Mechanical Pencils to regular graphite pencils. Suppose that 600 people, chosen at random and, each independent of the others, is surveyed.
 - (a) On average, how many people prefer Golden Mechanical Pencils?
 - (b) What is the standard deviation for the number of people who prefer Golden Mechanical Pencils?
 - (c) What is the probability that at least 270 people prefer Golden Mechanical Pencils?
 - (d) What is the probability that between 200 people and 250 people prefer Golden Mechanical Pencils?
 - (e) What is the probability that less than 250 people prefer Golden Mechanical pencils?
 - (f) What is the probability that exactly 250 people prefer Golden Mechanical pencils?

4. Suppose you work as a staff statistician for a pharmaceutical company. In clinical trials of a drug to treat acid reflux and stomach ulcers, you find that 4.7% of the patients participating in the study experienced headaches as a side effect of the drug. During a presentation of your analysis of the data obtained throughout the clinical trials for this drug to the CEO and the other officers of the company, the CEO asks you, "If we consider a group of 275 people taking the drug, on average, how many people will experience headaches as a side effect of taking the drug?" What is the answer to the CEO's question?

5. Based on clinical trials, 12.9% of patients experience nasopharyngitis (inflammation of the nasal passages and of the upper pharynx) when taking a 10 mg dose of Lipitor. One hundred people taking Lipitor are surveyed.
 - (a) On average, how many of those surveyed experience nasopharyngitis?
 - (b) What is the probability that one-fifth of those surveyed experience nasopharyngitis?
 - (c) What is the probability that at least one-quarter of those surveyed experience nasopharyngitis?
 - (d) What is the probability that no more than one-tenth of those surveyed experience nasopharyngitis?
 - (e) What is the probability that between one-tenth and one-fifth of those surveyed experience nasopharyngitis?