

## Scenario 1

A manufacturer of ceramic tiles reports 3.9 job-related accidents per year. Accident categories include trip, fall, struck by equipment, transportation, and handling. Let  $X$  be the number of accidents reported in a given year, where  $X$  follows a Poisson distribution. Suppose a year is selected at random.

Conduct a simulation experiment to estimate the probability that there will be no job-related accidents.

*Additional Question [Do not simulate, use theoretical formulas.]*

If the number of accidents is more than three standard deviations above the mean, the company insurance carrier will raise the rates. What is the probability of an increase in the company's insurance bill?

1

## Scenario 2

Hydroelectric projects are carefully monitored and their energy capability is predicted for several years into the future. Suppose the Pacific Utilities Committee claims its hydroelectric project generates electricity according to a normal distribution. The mean electricity generated per year equal to 35 megawatts and the standard deviation is 2.86 megawatts.

Conduct a simulation experiment to estimate the probability the hydroelectric project will generate at least 37.8 megawatts for a given year.

*Additional Questions [Do not simulate, use theoretical formulas.]*

Suppose the years are independent, and the hydroelectric project will record a profit in a given year if it is able to generate at least 38.1 megawatts that year. What is the probability that the project will record a profit for four consecutive years?

Suppose that the electricity generated during a certain year is 33.5 megawatts. Is there any evidence to suggest that the claim made by Pacific Utilities is false? Justify your answer.