

University of California, Los Angeles  
Department of Statistics

Statistics 13

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Lab...

Use SOCR to answer the following questions:

- a. From a large shipment of peaches, 12 are selected for quality control. Suppose that in this particular shipment only 65% of the peaches are unbruised. If among the 12 peaches 9 or more are unbruised the shipment is classified A. If between 5 and 8 are unbruised the shipment is classified B. If fewer than 5 are unbruised the shipment is classified C. Compute the probability that the shipment will be classified A, B, C.
- b. The magnitude  $X$  of earthquakes recorded in California can be modeled as having an exponential distribution with mean 2.4 as measured on the Richter scale. Find the probability that an earthquake striking California will
  - i. exceed 5.4 on the Richter scale.
  - ii. fall between 2.0 and 3.0 on the Richter scale.
- c. The admissions office of a small, selective liberal-arts college will only offer admission to applicants who have a certain mix of accomplishments, including a high SAT score. Based on past records, the head of the admissions feels that the probability is 0.58 that an admitted applicant will come to the college. Based on financial considerations, the college would like a class of size 310 or more. Find the smallest  $n$ , number of people to admit, for which the probability of getting 310 or more to come to the college is at least 0.95. Write the expression that you need to solve to find  $n$  and then use *SOCR* to find the answer.
- d. Graph and print  $X \sim exp(\lambda = 0.2)$ . Find one percentile of this distribution (your choice!) using the mouse or the Left Cut Off or Right Cut Off points. Then verify that this percentile you choose can be computed also with the following formula:

$$x_p = \frac{\ln(1 - \frac{p}{100})}{-\lambda}, \text{ where } p \text{ is the percentile you choose, e.g. } p = 10 \text{ (for 10\%), etc. Can you explain how we get this formula?}$$

In the figure below, 0.6951 is approximately the 75<sup>th</sup> percentile (left area is 0.750975).

