Practice Sheet (2)

Md. Ismail Hossain Riday

Example 1

- Two balanced dice, one black and one red are thrown and the number of dots on their upper faces are noted. Let, “b” be the outcomes of the black die, and “r” the outcomes of the red die, and both “b”; “r” varies from 1 to 6. Find,

a) The probability of throwing a double. (Ans: 1/6)

b) If you continue this experiment 15 times, and each time throwing a double is considered a "success", determine the probability of getting success at least three times.

Example 2

- Suppose you, as a product manager, hypothesize that the average response time of your customer service team is 3 minutes. To test this hypothesis, you randomly select 40 customer service interactions and record the response times. The descriptive analysis reveals an average response time of 2.5 minutes. Given that the population variance is known to be 1 minute, assess the validity of your hypothesis using the P-value approach.

Example 3

- Suppose that 2 batteries are randomly chosen from a box containing 10 batteries of which 7 are good and 3 are defective. Let $\boldsymbol{X}$ denote the number of good batteries chose. Calculate mean and variance of your random variable.

Example 4

- Suppose the scores on a standardized test are normally distributed with a mean of 7 and a variance of $\frac{2}{5}$. The top students will be awarded a special certificate.

a) What score is needed to qualify for this certificate, if the top 25% of students will be awarded a special certificate?

b) What score is needed to qualify for this certificate, if the bottom 25% of students will be awarded a special certificate?

c) Suppose 10 researcher have conducted the tests independently, then what is the probability that 3 researchers will get students with a score of at least 8? Interpret your outcome.

Thank You