

Quiz 7

Question 1:

An analyst has available two forecasts, F_1 and F_2 , of earnings per share of a corporation next year. He intends to form a compromise forecast as a weighted average of the two individual forecasts. In forming the compromise forecast, weight X will be given to the first forecast and weight $(1 - X)$ to the second, so that the compromise forecast is $XF_1 + (1 - X)F_2$. The analyst wants to choose a value between 0 and 1 for the weight X , but he is quite uncertain of what will be the best choice. Suppose that what eventually emerges as the best possible choice of the weight X can be viewed as a random variable uniformly distributed between 0 and 1, having the probability density function

$$f(x) = \begin{cases} 1 & \text{for } 0 \leq x \leq 1 \\ 0 & \text{for all other values of } x \end{cases}$$

- Draw the probability density function.
- Find and draw the cumulative distribution function.
- Find the probability that the best choice of the weight X is less than 0.25.
- Find the probability that the best choice of the weight X is more than 0.75.
- Find the probability that the best choice of the weight X is between 0.2 and 0.8.

Question 2:

Let the random variable X follow a normal distribution with $\mu = 50$ and $\sigma^2 = 64$.

- Find the probability that X is greater than 60.
- Find the probability that X is greater than 35 and less than 62.
- Find the probability that X is less than 55.
- The probability is 0.2 that X is greater than what number?
- The probability is 0.05 that X is in the symmetric interval about the mean between which two numbers?