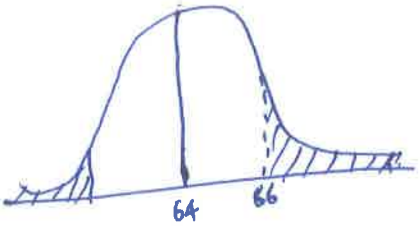
Gokul Reddy

Q1.

a] Population mean = 100

b] Sample mean = 64

c]

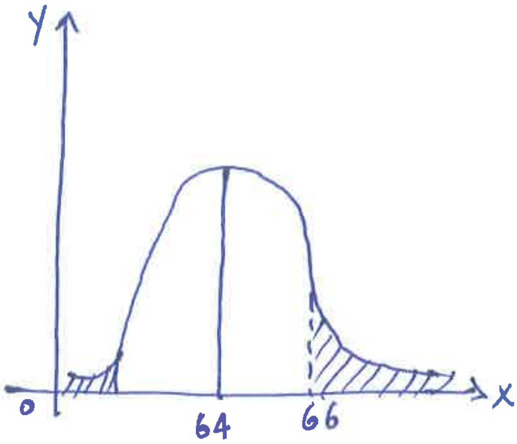


$66 - 64 = 2$

$S.e = \frac{2}{10} = 0.2$

* Standard error $= \frac{\sigma}{\sqrt{n}}$

e]



Q2.

a] The prior probability here in the above equation is P(A), the value of the prior probability based on the example is 20%.

b] The Posterior probability in the equation above is P(B|A), If a message is spam, the filter marks it as spam with 90% probability.

$P(B\|A) = 90\%$, $P(A) = 20\%$
$P(B\|A^c) = 5\%$, $P(A^c) = 80\%$

c] $$P(A|B) = \frac{P(B|A)\,P(A)}{P(B|A)\,P(A) + P(B|A^c)\,P(A^c)}$$

$$= \frac{\left(\frac{90}{100}\right)\left(\frac{20}{100}\right)}{\left(\frac{90}{100}\right) + \left(\frac{20}{100}\right) + \left(\frac{5}{100}\right)\left(\frac{80}{100}\right)} = \frac{\frac{9}{50}}{\frac{9}{50} + \frac{4}{50}}$$

$$= \frac{\frac{9}{50}}{\frac{13}{50}} = \frac{9}{13}$$

d] The Posterior Probability will be higher.