homework

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1 Ex 1

$P(positive) = P(positive|Hansen)*P(Hansen)+P(positive|noHansen)*P(noHansen)$

=

$$0.98 * 0.05 + 0.03 * 0.95$$

=

$$0.0775$$

$$P(Hansen|positive) = \frac{P(positive|Hansen).P(Hansen)}{P(positive)}$$

=

$$\frac{0.98 * 0.05}{0.0775}$$
$$\approx \ 0.6323$$

2 Ex 2

suppose univariate normal distribution is normalized :

then $Z = \frac{X-\mu}{\sigma}$ (Z N(0,1))

+ $E(Z) = E(\frac{X-\mu}{\sigma} = \frac{1}{\sigma}E(x-\mu) = \frac{1}{\sigma}(E(X)-\mu) = 0$
+ $V(Z) = V(\frac{X-\mu}{\sigma}) = \frac{1}{\sigma^2}V(X-\mu) = 1$