•An
oil explorer performs a seismic test to determine whether oil is likely to be found in a certain area. The probability that the test indicates the presence of oil is 90% if oil is indeed present in the test area and the probability of a false positive is 15% if no oil is present in the test area. Before the test is done, the explorer believes that the probability of presence of oil in the test area is 40%. Use Bayes' rule to revise the value of the probability of oil being present in the test area given that the test gives a positive signal.

วิธีทำ หา Prob ของ $P(f \mid pos)$

$P(f) = 0.4 \quad P(pos \mid f) = 0.9$
$P(nf) = 0.6 \quad P(pos \mid nf) = 0.15$

สมการ Bayes

$$P(f \mid pos)\,P(pos) = p(pos \mid f)\,p(f)$$

$$p(f \mid pos) = \frac{P(pos \mid f)\,p(f)}{p(pos)} \longrightarrow P(pos) = p(pos \mid nf)\,P(nf) + P(pos \mid f)\,p(f)$$

$$= \frac{0.9 \times 0.4}{0.9 \times 4 + 0.15 \times 0.6} = \frac{0.36}{0.36 + 0.09} = 0.8 \#$$

∴ ค่าน่าจะเป็นที่จะเจอน้ำมันคือ 0.8 หรือ 80 %

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