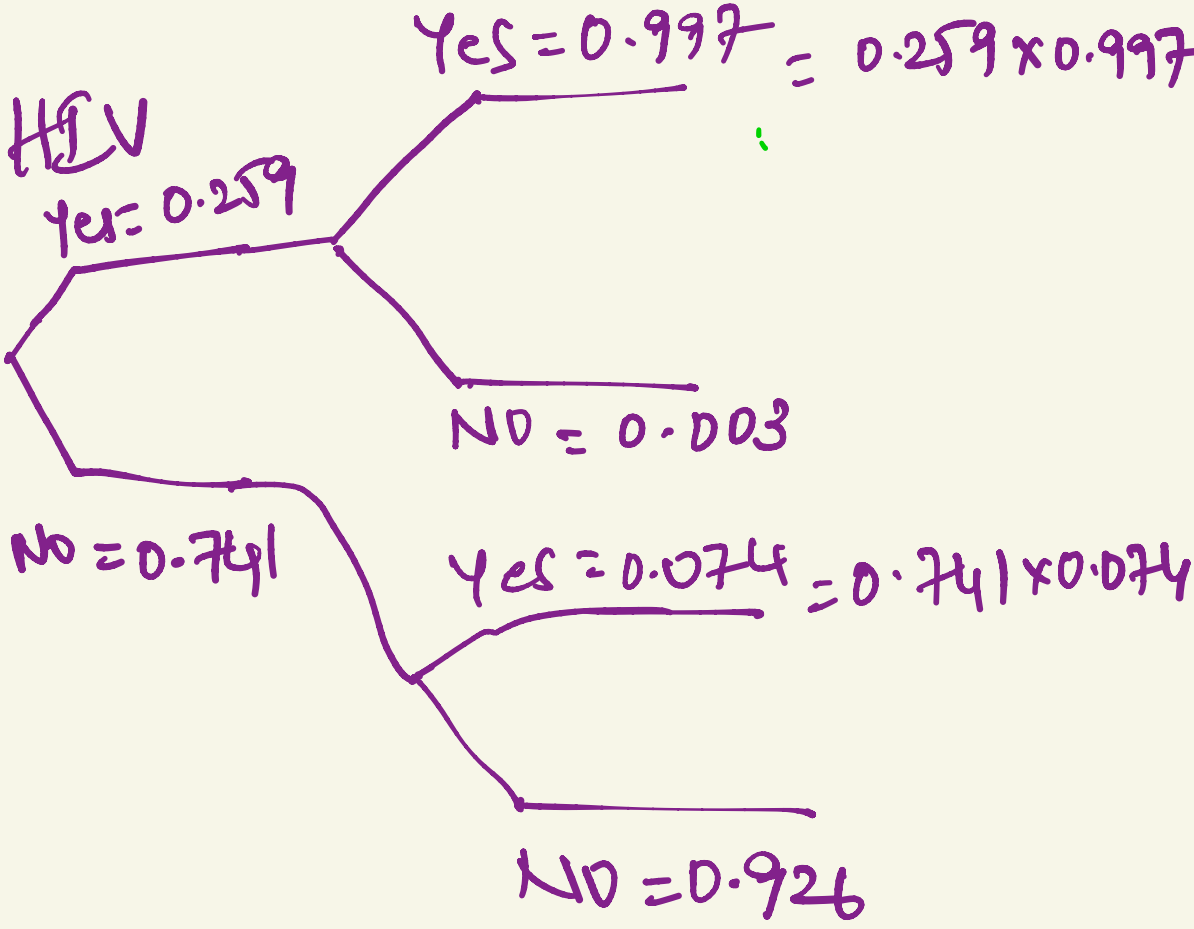

$$P(\text{HIV} \mid \text{tested +ve}) = \frac{P(\text{HIV and testing +ve})}{P(\text{testing +ve})}$$

$$= \frac{0.259 \times 0.997}{0.259 \times 0997 + 0.741 \times 0.074} = 0.8247$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

If A and B are independent

$$P(A \text{ and } B) = P(A) * P(B)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$= \frac{P(A) * P(B)}{P(B)}$$

$$P(A|B) = P(A)$$

Probability of Success

$p = 0.1$ $q = 1 - 0.1$

$x = 1$ $n = 5$ $= 0.9$

$$P(X=1) = {}^{n}C_{x}\, p^{x} (1-p)^{n-x}$$

$$= {}^{5}C_{1} (0.1)^{1} (0.9)^{5-1}$$

$$= \frac{5!}{1!(5-1)!} (0.1)(0.9)^{4}$$

$$= \frac{5 \times 4!}{4!} (0.1)(0.9)^{4}$$

$$= 2$$

probability student pass a course = 0.82

total students = n = 8

Probability that all 8 will pass the class

failing probability = 1 − 0.82 = 0.18

$$8C_8 (0.82)^8 (0.18)^{8-8}$$

$$8C_8$$

$\Rightarrow$

Probability that none will pass

$$8C_0 (0.82)^0 (0.18)^{8-0}$$

$$8C_0$$

Probability that atleast 6 students will pass the course

$$P(x=6) + P(x=7) + P(x=8)$$

$$\binom{8}{6}(0.82)^6(0.18)^2 + \binom{8}{7}(0.82)^7(0.18) + \binom{8}{8}(0.82)^8(0.18)^0$$

=

Probability that atmost 2 students will pass the class

$$P(x=0) + P(x=1) + P(x=2)$$

$$\binom{8}{0}(0.82)^0(0.18)^8 + \binom{8}{1}(0.82)^1(0.18)^7 + \binom{8}{2}(0.82)^6(0.18)^2$$

=

Probabity a fuse is defective
$= 0.1$

Probability of failure $= 1 - 0.1$
$= 0.9$

1st defective fuse on first test $= 0.1$

1st defective fuse on the second test
0.9×0.1

1st defective fuse in the third test
$0.9 \times 0.9 \times 0.1$