In [3]:

```python
#calculate P(A/B) given P(A),P(B/A),P(B|notA)
def bayes_theorem(p_a,p_b_given_a,p_b_given_not_a):
    #calculate P(notA)
    not_a=1-p_a
    #calculate P(B)
    p_b=p_b_given_a* p_a+p_b_given_not_a*not_a
    #calculate P(A|B)
    p_a_given_b = (p_b_given_a*p_a)/p_b
    return p_a_given_b

#P(A)
p_a = 0.0002
#P(B)
p_b_given_a = 0.85
#P(B|not A)
p_b_given_not_a = 0.05
#calculate P(A|B)
result = bayes_theorem(p_a,p_b_given_a,p_b_given_not_a)
#summarize
print('P(A|B) = %3f%%'%(result * 100))
```

```
p_b
p_b_given_a
p_b_given_not_a
```

P(A|B) = 0.338915%

In [ ]:

```
1
```