A diagnostic test has a 98% probability of giving a positive result when applied to a person suffering from Thripshaw's Disease, and 10% probability of giving a (false) positive when applied to a non-sufferer. It is estimated that 0.5 % of the population are sufferers. Suppose that the test is now administered to a person whose disease status is unknown. Calculate the probability that the test will:

Intuition:

1. Be positive - a bit greater than 10%.

False positive rate(0.1) + True positive rate(0.98*0.005)

2. Correctly diagnose a sufferer of Thripshaw's - a bit less that 0.005

True positive rate(0.98*0.005)

3. Correctly identify a non-sufferer of Thripshaw's - 90%

True negative rate (0.9)

4. Misclassify the person - a small bit greater than 10%

False positive rate(0.9) + False negative rate(0.02*0.005)

Calculations:

	Test positive	Test negative
Thripshaw positive (0.005)	0.0049	0.0001
Thripshaw negative (0.995)	0.0995	0.8955

1. Be positive - 0.1044

False positive rate(0.0995) + True positive rate(0.0049)

2. Correctly diagnose a sufferer of Thripshaw's - 0.0049

True positive rate(0.98*0.005)

3. Correctly identify a non-sufferer of Thripshaw's - 0.8955

True negative rate (0.8955)

4. Misclassify the person - 0.0996

False positive rate(0.0995) + False negative rate(0.001)