▾ Post Read: - Market Basket Analysis

- There are two more concepts which are discussed when studying assosiate rule mining/market basket analysis. They are **Leverage** and **Conviction**

- Keeping the same conventions, we stated that a person buying X also tends to by Y, where X and Y are item sets. We'll use these terms for understanding the two topics

Leverage

- There is another metric called **leverage** that is constructed using support. This is very similar to lift.

- Leverage computes the difference between the observed frequency of X and Y appearing together and the frequency that would be expected if X and Y were independent. A leverage value of 0 indicates independence.

Q. How is leverage calculated?

- To compute the leverage of "if X then Y" i.e. $X-> Y$, we compute the support of X and Y, and subtract the product of support of X, and support of Y from it.

$$leverage(X-> Y) = support(X \cap Y) - (support(X) * support(Y$$

Q. What is the advantage of using leverage over lift values

- Though it is similar to lift, but leverage is **easier to interpret**.
- Leverage value lies in the range of **-1 to +1**, whereas lift value ranges from 0 to infinity.

Conviction

- Conviction is another way of measuring association, although it is a bit harder to get your head around. It compares the probability that X appears without Y if they were independent with the actual frequency of the appearance of X without Y.

Q. How can we calculate conviction value?

- It can be calculated as the ratio of the expected frequency that X occurs without Y if X and Y were independent divided by the observed frequency of incorrect predictions.

$$Conv(X \to Y) = \frac{1 - S(Y)}{1 - C(X \to Y)}$$

> **Note:**

- A high value means that the consequent depends strongly on the antecedent.