Support:

support($A \rightarrow C$) = support($A \cup C$), range: [0, 1]
Introduced in [3]

The support metric is defined for itemsets, not association rules. The table produced by the association rule mining algorithm contains three different support metrics: 'antecedent support', 'consequent support', and 'support'.

- 'Antecedent support' computes the proportion of transactions that contain the antecedent A.
- 'Consequent support' computes the support for the itemset of the consequent C.
- 'Support' computes the support of the combined itemset $A \cup C$.

Support is used to measure the abundance or frequency (often interpreted as significance or importance) of an itemset in a database. An itemset is referred to as a "frequent itemset" if its support is larger than a specified minimum-support threshold. Due to the downward closure property, all subsets of a frequent itemset are also frequent.

Confidence:

confidence($A \rightarrow C$) = support($A \rightarrow C$) / support(A), range: [0, 1]
Introduced in [3]

The confidence of a rule $A \rightarrow C$ is the probability of seeing the consequent in a transaction given that it also contains the antecedent. Note that the metric is not symmetric; the confidence for $A \rightarrow C$ is different from the confidence for $C \rightarrow A$. The confidence is 1 (maximal) for a rule $A \rightarrow C$ if the consequent and antecedent always occur together.

Lift:

lift($A \rightarrow C$) = confidence($A \rightarrow C$) / support(C), range: [0, ∞]
Introduced in [4]

The lift metric measures how much more often the antecedent and consequent of a rule $A \rightarrow C$ occur together than expected if they were statistically independent. If A and C are independent, the lift score will be exactly 1.

Leverage:

leverage($A \rightarrow C$) = support($A \rightarrow C$) − support(A) × support(C), range: [−1, 1]
Introduced in [5]

Leverage computes the difference between the observed frequency of A and C appearing together and the expected frequency if A and C were independent. A leverage value of 0 indicates independence.

Conviction:

conviction(A → C) = (1 − support(C)) / (1 − confidence(A → C)), range: [0, ∞]
Introduced in [6]

A high conviction value means that the consequent is highly dependent on the antecedent. For instance, in the case of perfect confidence, the denominator becomes 0 (due to 1 - 1), and the conviction score is defined as 'inf'. Similar to lift, if items are independent, the conviction is 1.

Zhang's Metric:

zhangs_metric(A → C) = (confidence(A → C) − confidence(A′ → C)) / Max[confidence(A → C), confidence(A′ → C)], range: [−1, 1]
Introduced in [7]

Zhang's metric measures both association and dissociation. A positive value (>0) indicates association, and a negative value indicates dissociation.