Assignment 1

# Question 1

## Part (a)

According to Bayes rule,

Therefore, we can conclude that is only relevant to and, but not .

The main disadvantage of ignoring is that confidence is lack of comparative power among the whole dataset because the underlying effect of two observed rules are not comparable if they have different support even the confidences are the same.

For example, it is the first time that Alice watches a scary movie, and then she clicks in another comedy in the recommendation list. The sample size is too small to conclude that "Alice always click on a comedy after watching scary movies."

However, by definition, Lift and Conviction have already incorporate the effect of support by multiplication.

## Part (b)

**Confidence is not symmetrical** because is not guaranteed to hold.

**Lift is symmetrical** because

**Conviction is not symmetrical** because

While .

It is easy to make up a counter example so that :

In this example and .

## Part (c)

Confidence is optimal

Lift is optimal

Conviction is not optimal