

**Assignment Sheet 1****November 6, 2023****Task 1**

Each item can be in exactly one of three places for an association rule,

1. left hand side,
2. right hand side,
3. not part of the rule.

Therefore this gives an upper limit for the number of rules to be  $3^d$ .

From these we have to subtract nonsensical cases where one of the sides of the left or right hand side are empty. There are  $2 \times 2^d = 2^{d+1}$  cases.

The case where both sides are empty has now been subtracted twice so we have to add back 1.

Leaving us with the formula:

$$3^d - 2^{d+1} + 1$$

**Task 2**

We found the following itemsets with a minimum frequency of 3:

E	4
O	3
M	3
Y	3
K	5
EO	3
EK	4
KO	3
KM	3
KY	3
EKO	3

### Task 3