

## Pre-class Learning Activities for Session 3

- Complete the following learning activities (listed below) before class.
- References are optional and not meant to be read from first page to last. Refer if necessary.
- You may be asked to volunteer/present your work for class participation points.
- If you presented your work in class, remember to email your work to instructor after class.
- You may be asked to provide comments/add-ons to work presented by students.

### Learning Activities:

1. In NTULearn Main Site, watch Lecture Video S3.1 What is an Association Rule.
2. Read: Lucas Lau and Arun Tripathi (2001) Mine Your Business — A Novel Application of Association Rules for Insurance Claims Analytics. Casualty Actuarial Society E-Forum, Winter 2011.
3. Activity 1: After reading the above paper, write down your answers (in your own words).
  - i. Explain in your own words, the meaning of the concept “Confidence”, and why is this measure useful?
  - ii. Explain in your own words, the meaning of the concept “Support”, and why is this measure useful?
  - iii. Explain in your own words, the meaning of the concept “Lift”, and why is this measure useful? Is Lift still necessary if we have a rule that has high confidence and high support?
  - iv. The Apriori algorithm is the standard method for generating association rules. (a) Explain in your own words, in a few sentences, how it works. (b) Is this sufficient to compute Confidence? Explain.
  - v. Is Confidence or Lift a symmetric concept? Explain. Implications?
  - vi. Provide another potential application of association rules beyond groceries and insurance claims.
4. Read tutorial on how to do association rules in R (or read article in PDF provided):  
<https://towardsdatascience.com/association-rule-mining-in-r-ddf2d044ae50>
5. Read How to convert from 5 different data formats into transactions datatype.PDF
6. Create the wide data format and long data format for the dataset milk.csv (Wikipedia 5 transactions example).

### R References:

- arules.PDF (provided)
- arules.Viz.PDF (provided)
- Explanation about the Transaction class [data format] required in arules:  
[https://www.jdatalab.com/data\\_science\\_and\\_data\\_mining/2018/10/10/association-rule-transactions-class.html](https://www.jdatalab.com/data_science_and_data_mining/2018/10/10/association-rule-transactions-class.html)

### Python References:

- mlxtend: [http://rasbt.github.io/mlxtend/user\\_guide/frequent\\_patterns/apriori/](http://rasbt.github.io/mlxtend/user_guide/frequent_patterns/apriori/)
- apyori: <https://stackabuse.com/association-rule-mining-via-apriori-algorithm-in-python/>