

EE4483/IM4483 Artificial Intelligence and Data Mining

Continuous Assessment - Homework

Due: Friday, 17 November 2017

You are to perform association analysis on a market basket transaction dataset “GroceryBasket.pdf”.

The dataset consists of a total of 180 transactions with 20 items : {Apple, Banana, Coffee, Diaper, Egg, Fish, Ginger, Ham, Ice-Cream, Jam, Ketchup, Lemon, Milk, Nuts, Olive, Peanut-Butter, Quiche, Rootbeer, Salad, Tea}.

You may use any suitable data mining software tool(s) to analyze the data and answer the following questions.

- 1) How many frequent itemsets have the minimum support of 20%, 10%, 5%, and 3% respectively?
- 2) What are the respective percentages of frequent 3-itemsets, and 2-itemsets, with respect to all possible itemsets, which have a minimum support of 3%?
- 3) How many association rules have a minimum confidence of 50% and a minimum support of 5% and 10%, respectively? Briefly explain how the *minimum support* affects the strong rules generated.
- 4) List three association rules that have the highest support with 100% confidence?
- 5) Do you find any “interesting” rules? What are they? Briefly explain why.

Notes:

You may use any suitable software tools for your work. Clearly state the software tools/functions used to complete this homework.

You may consider using one of the following data mining software tools for your work.

- Orange [<http://orange.biolab.si>]
- Weka [<http://www.cs.waikato.ac.nz/ml/weka/>]
- KNIME [<https://www.knime.org>]
- Rapidminer [<https://rapidminer.com>]
- R-Programming [<https://www.r-project.org>][<http://www.rdatamining.com>]

If you couldn't find answers to any of the questions above, you may describe what you have done and attach the relevant screenshots or codes, if available.

You are expected to uphold NTU Honor Code.

Submit your work in hardcopy to me on the 17th Nov @LT29 by 11:30am.

Banana, Ham, IceCream, Egg, Quiche, Olive, Diaper, Tea, Jam
Nuts
Apple, Nuts, Ketchup
Coffee, Jam, Rootbeer, PeanutButter
Rootbeer, Coffee, Apple, Quiche, Egg
Diaper, Ketchup, Ginger
PeanutButter, Ginger, Ham, Olive, Egg, Salad, Apple
PeanutButter
Coffee, IceCream, Rootbeer, Salad
Ginger, Quiche
Fish, Ketchup, Banana, Tea, Olive, Quiche, Diaper
Coffee, Salad
Banana, Tea, Egg, Olive, Diaper, Lemon, Rootbeer, Quiche, Salad
PeanutButter, Ham, Ketchup, Banana, Egg, Quiche, Milk, Lemon, Jam, Rootbeer
Egg, Fish, Olive, Diaper, Apple, Rootbeer, Lemon, Jam, Ketchup, Tea
Jam, Lemon, Ginger, IceCream, Diaper, Apple, Milk
Apple, Fish, Lemon, Ham, Jam, Salad, Rootbeer, Banana, Milk
Fish, Salad, Ginger, Olive, Diaper, Banana, Quiche, PeanutButter, Ham, Apple
Salad, Apple, IceCream, Tea, Quiche, Ham, Diaper, Nuts, Ketchup, Fish
Ketchup, Nuts, Coffee, Apple, Ginger, Lemon, IceCream, Salad, Egg, Ham
Coffee, Jam
Fish, Tea, Lemon, Egg
Coffee, Egg, Lemon, Tea, Ham, PeanutButter
Egg, IceCream, Diaper, Olive, Coffee, Fish, Rootbeer, PeanutButter, Apple
IceCream
Coffee
Salad, Rootbeer
Ginger, PeanutButter, Diaper, Fish, Olive, Egg, Rootbeer
Tea, Ginger, Lemon, Quiche, Ham
Nuts, Banana, Egg, Tea, Diaper, Rootbeer
Ketchup, Nuts, Jam, Quiche, Apple, Tea, Coffee, IceCream, PeanutButter
Tea, Egg, Banana, PeanutButter, Olive, Coffee, Ham, Apple, Nuts
Lemon
Lemon, Ginger
IceCream, Quiche, Tea, Coffee
Olive, Nuts, Lemon, Jam, Diaper, Ginger, Ham, Apple
Diaper, Olive, Tea, Apple, Fish, Banana, Ketchup, Nuts, Jam, IceCream
PeanutButter, Ketchup, Apple
Apple, Ginger, Lemon, Coffee, Tea, Ketchup, Banana, Rootbeer, Egg
Jam, Ketchup, Diaper, Nuts, Lemon, Olive, Rootbeer, Ginger
Ginger, Jam, Quiche, Nuts, Ketchup, Salad, Ham
Jam, Olive, Fish, Milk, Egg, Ham, Apple, Nuts, Banana
Ginger, Nuts, Rootbeer, Lemon, Ketchup, PeanutButter, Apple
Rootbeer, Lemon, Banana, Tea, Salad
Ham, Banana, Quiche
Egg, IceCream, Apple, Lemon, Rootbeer, PeanutButter, Coffee, Tea, Ham, Diaper
Diaper, Nuts, Banana, Coffee, IceCream, Apple, Ham
Rootbeer, PeanutButter
Nuts, Apple, Ketchup, Coffee, Milk, Diaper, Lemon, Quiche
Milk, Lemon, IceCream, Jam, Ketchup
Milk, Coffee, Ham, Diaper, Fish, Banana, Tea, Nuts, Quiche, IceCream
Egg, Salad, Lemon, Banana, Diaper, Ketchup, PeanutButter
Olive, Diaper, IceCream, Ketchup, Ham, Coffee, Salad
Salad, Jam, Quiche, Egg
Fish
Salad, IceCream, Rootbeer, Quiche, Apple
Coffee, Ginger, Ketchup, Jam, Fish, Quiche, Milk, Olive, Egg
PeanutButter, Ketchup, Diaper, Jam
Tea, Milk, Coffee, Fish, Apple, Lemon, Olive, Ham
Fish, Diaper, Olive, Tea, Apple
Ham, Milk, Quiche, Lemon, Olive, Apple, Tea
Rootbeer
Egg
Quiche, Ginger
Jam, Banana, Tea, Nuts, Olive, Milk, IceCream
Fish, Apple
Diaper, Egg, Ginger, PeanutButter, Salad, Banana

Salad, Fish
Rootbeer, Ketchup, Coffee, Olive
PeanutButter, IceCream, Milk, Nuts
Quiche, Milk, Salad, Nuts
Rootbeer, Tea, Lemon
Lemon, Coffee, Milk
Ketchup
Tea, Ham, Quiche
PeanutButter, Banana, Nuts, Tea, Lemon, IceCream, Ketchup, Olive, Ham
Banana, Coffee, Fish, Jam, Apple, Ginger
Ginger, Banana, Egg, Jam, IceCream
Diaper, Rootbeer, Ketchup, Jam, IceCream, Nuts
Apple, Olive
Milk, Banana, Rootbeer, Egg, Ginger, Coffee, Diaper
Ketchup, Diaper, Tea, Lemon, Jam
Apple, Ketchup, Lemon, Salad, Egg, Rootbeer, Coffee
Ginger, Ham, Quiche
Nuts, Lemon, Fish, Rootbeer, Jam, PeanutButter, Ketchup, Coffee, Ham, Banana
Coffee, Nuts, Salad, Apple, Banana, Jam, Ketchup
PeanutButter
Diaper, Ham, Jam, Ginger
Salad, Fish, Olive, Banana, Apple
Diaper, Fish, Coffee, Olive, Tea
Jam, Diaper, Fish, Salad, Ketchup, Banana, Ham, Apple, IceCream, PeanutButter
Apple, Ginger, Nuts, Tea, Ham, Diaper
Jam, Quiche, Egg, IceCream, Ginger, Banana, Olive, Diaper, Milk, Coffee
Ginger, Rootbeer, Banana
Lemon
Ginger, Banana, PeanutButter, Salad, Ketchup
Milk, Coffee, Rootbeer, PeanutButter
Olive, Ham, Ketchup, Fish
Ham
Lemon
PeanutButter, Fish, Rootbeer, IceCream, Ham, Diaper, Banana
Jam, Quiche, Diaper, Olive, Tea
Milk, Ginger, IceCream, Rootbeer, Diaper, Quiche
Quiche, Salad, Nuts, Diaper
Egg, Nuts, PeanutButter, Fish, Jam
Apple, Rootbeer, Ginger, Nuts, Ham, Olive, Quiche
Quiche, Jam, Apple, Ketchup, Lemon
Quiche, IceCream, Fish, Olive, Rootbeer, Ginger, Apple, Banana, PeanutButter, Ketchup
IceCream, Banana, Ham, Coffee, Tea, Olive, Lemon, Fish, Diaper
Quiche, Milk, Lemon, IceCream, PeanutButter, Ham, Olive, Coffee, Ginger, Nuts
Tea, Rootbeer, Ginger
Milk, PeanutButter, Tea, Ketchup, Jam
Fish, Milk
Ham, PeanutButter, Milk, Rootbeer, Nuts, Ginger, Lemon
Lemon
Ginger, Ketchup, Lemon, Tea, Quiche, Salad, PeanutButter, Ham, IceCream
Banana, Coffee, Fish, IceCream, Lemon
Coffee, IceCream, Egg, Quiche, Milk, Apple, Diaper, Rootbeer, Ginger, Lemon
Fish, Diaper, Egg, Coffee, Olive, Apple
Diaper, Jam, Quiche, Ginger, Egg, Nuts, Lemon, Fish, Coffee
Lemon, Rootbeer, Nuts, Banana, IceCream, Ham
Lemon, Tea
Salad, Milk, Nuts, Quiche
Ham, Olive
Egg, Coffee
Olive, Banana, Apple, Nuts, PeanutButter, Rootbeer, Ham
Lemon, PeanutButter, Tea, Salad, Milk, IceCream
Salad, Apple, Fish, Milk, Egg, Coffee, Ginger, Ketchup
Apple, Milk, PeanutButter, Ginger, Coffee, Rootbeer, Nuts
Diaper
Fish, Milk
PeanutButter, Quiche, Rootbeer
Ketchup, Banana, Jam, Fish, Diaper
Quiche, Coffee, PeanutButter

Tea, Diaper, Egg, Banana, Ketchup, Fish
Fish, Quiche, Olive, Ham
Ham, Salad, Lemon, Tea, Quiche, Banana, Ginger, Apple, PeanutButter
Apple, Tea
Coffee, Milk, Ketchup, Olive, Ginger, Tea, Nuts
IceCream, Rootbeer
Ketchup, Egg, Fish
Jam, Coffee, Rootbeer, PeanutButter, Milk
Apple
Salad, Jam, Nuts, Ginger, Diaper, PeanutButter
Milk, Egg, Lemon, Nuts, Olive, Quiche, Ginger
PeanutButter, Jam
Ginger, Milk, Banana, Tea, Olive, Salad
Nuts, IceCream, Ginger, Ketchup, Jam, Salad, Rootbeer, Coffee, Apple, Banana
Milk, Egg, Ham, PeanutButter, Apple, Ginger, Ketchup, Quiche, Rootbeer, Banana
Ham, Lemon, Apple, Coffee, Milk, Banana, Nuts, Egg, Salad, Ketchup
Rootbeer, Apple, Tea, Nuts, Fish, Ginger, Milk
Quiche
Diaper, Ketchup, Ham, Tea, Ginger, Banana
Jam, Lemon, Ham, Tea, Rootbeer, Olive, Quiche, Apple, Milk
Diaper, Ginger, Ketchup, Lemon, IceCream
PeanutButter
Coffee, Nuts, Egg, Jam, Milk, Diaper, Rootbeer, Ginger
Fish, Quiche, Jam, Apple, Banana, Ham, Lemon, Tea, IceCream
Lemon, Milk, Ham, Diaper, PeanutButter, Tea
Lemon
Olive, Tea, Diaper, Quiche, Rootbeer, Banana
Salad
Diaper, Milk, Nuts, Jam, PeanutButter, Rootbeer, Coffee, Lemon, Olive
Apple, IceCream, Fish, Olive, Tea, Diaper, Milk, Banana
Ginger, Olive, PeanutButter, Milk, Jam, Nuts, Tea
Milk, Jam, Tea, Coffee, Rootbeer, Banana, Apple, PeanutButter
Rootbeer, Fish, Coffee, Jam
Olive, Nuts, Apple
Ketchup, Lemon, Olive
Salad, Jam, IceCream, Nuts, Banana
Salad
Coffee, Apple, Egg, Banana, Milk, PeanutButter, Lemon, Olive, Salad, Diaper
Lemon, Egg, Banana
IceCream, PeanutButter
Ketchup, Salad, Coffee, Apple, Tea, Diaper
Olive, Ginger, Milk, Ketchup, Ham
Ketchup, Tea, Egg, Ginger
Nuts, Apple, Quiche, Egg, Salad, IceCream, Banana, Tea, Ham
Apple, Rootbeer, IceCream
Ginger, Nuts, Jam, Fish, PeanutButter, Coffee, Ham, Apple, Quiche