

Design document

Team Members:

Skanda 2016A7PS0236H

Deeksha 2016A7PS0809H

Vishal 2016A7PS0114H

Data set Used: groceries.csv posted on CMS

Preprocessing: Individual items were extracted and pruned w.r.t minimum support

Frequent Item Set and Association Rules are in the File Format attached

Maximal and Closed Item Sets are written below w.r.t support and confidence given.

Results for the groceries dataset:

Minimum Support: 100

Confidence=50

MAXIMAL:239

['semi-finished bread']

['condensed milk']

['UHT-milk']

['potted plants']

['flour']

['dishes']

['packaged fruit/vegetables']

['specialty bar']

['processed cheese']

['detergent']

['frozen dessert']
['candy']
['beverages']
['grapes']
['spread cheese']
['misc. beverages']
['hard cheese']
['cat food']
['baking powder']
['pickled vegetables']
['chewing gum']
['ice cream']
['canned fish']
['seasonal products']
['red/blush wine']
['specialty chocolate']
['flower (seeds)']
['salt']
['frozen meals']
['canned vegetables']
['herbs']
['white wine']
['pasta']
['cling film/bags']
['soft cheese']
['cake bar']
['frozen fish']
['dish cleaner']
['meat']
['mustard']
['liquor']
['roll products']
['tropical fruit', 'citrus fruit']
['pip fruit', 'citrus fruit']
['rolls/buns', 'citrus fruit']
['bottled water', 'citrus fruit']
['soda', 'citrus fruit']
['fruit/vegetable juice', 'citrus fruit']
['sausage', 'citrus fruit']
['citrus fruit', 'whipped/sour cream']

['citrus fruit', 'domestic eggs']
['margarine', 'yogurt']
['margarine', 'whole milk']
['margarine', 'other vegetables']
['margarine', 'rolls/buns']
['margarine', 'bottled water']
['margarine', 'soda']
['margarine', 'root vegetables']
['tropical fruit', 'pip fruit']
['tropical fruit', 'bottled water']
['tropical fruit', 'curd']
['soda', 'tropical fruit']
['tropical fruit', 'fruit/vegetable juice']
['tropical fruit', 'newspapers']
['tropical fruit', 'pastry']
['sausage', 'tropical fruit']
['brown bread', 'tropical fruit']
['tropical fruit', 'shopping bags']
['tropical fruit', 'whipped/sour cream']
['tropical fruit', 'domestic eggs']
['pip fruit', 'yogurt']
['cream cheese', 'yogurt']
['butter', 'yogurt']
['yogurt', 'bottled water']
['curd', 'yogurt']
['beef', 'yogurt']
['yogurt', 'frankfurter']
['yogurt', 'fruit/vegetable juice']
['yogurt', 'newspapers']
['yogurt', 'pastry']
['sausage', 'yogurt']
['brown bread', 'yogurt']
['shopping bags', 'yogurt']
['napkins', 'yogurt']
['yogurt', 'berries']
['yogurt', 'domestic eggs']
['yogurt', 'frozen vegetables']
['whole milk', 'coffee']
['other vegetables', 'coffee']
['rolls/buns', 'coffee']

['whole milk', 'cream cheese']
['whole milk', 'long life bakery product']
['whole milk', 'bottled beer']
['whole milk', 'white bread']
['whole milk', 'chocolate']
['whole milk', 'curd']
['whole milk', 'beef']
['whole milk', 'frankfurter']
['whole milk', 'chicken']
['whole milk', 'sugar']
['whole milk', 'newspapers']
['whole milk', 'butter milk']
['whole milk', 'salty snack']
['whole milk', 'waffles']
['whole milk', 'brown bread']
['whole milk', 'shopping bags']
['whole milk', 'hamburger meat']
['whole milk', 'hygiene articles']
['whole milk', 'napkins']
['whole milk', 'berries']
['whole milk', 'dessert']
['whole milk', 'ham']
['whole milk', 'oil']
['whole milk', 'frozen vegetables']
['whole milk', 'onions']
['whole milk', 'sliced cheese']
['pip fruit', 'rolls/buns']
['pip fruit', 'bottled water']
['soda', 'pip fruit']
['pip fruit', 'pastry']
['pip fruit', 'root vegetables']
['sausage', 'pip fruit']
['cream cheese', 'other vegetables']
['other vegetables', 'long life bakery product']
['bottled beer', 'other vegetables']
['white bread', 'other vegetables']
['chocolate', 'other vegetables']
['curd', 'other vegetables']
['beef', 'other vegetables']
['other vegetables', 'frankfurter']

['other vegetables', 'chicken']
['other vegetables', 'sugar']
['other vegetables', 'newspapers']
['butter milk', 'other vegetables']
['salty snack', 'other vegetables']
['brown bread', 'other vegetables']
['shopping bags', 'other vegetables']
['hamburger meat', 'other vegetables']
['napkins', 'other vegetables']
['other vegetables', 'berries']
['dessert', 'other vegetables']
['frozen vegetables', 'other vegetables']
['onions', 'other vegetables']
['butter', 'rolls/buns']
['butter', 'root vegetables']
['butter', 'whipped/sour cream']
['bottled beer', 'rolls/buns']
['rolls/buns', 'bottled water']
['chocolate', 'rolls/buns']
['beef', 'rolls/buns']
['rolls/buns', 'frankfurter']
['soda', 'rolls/buns']
['rolls/buns', 'fruit/vegetable juice']
['rolls/buns', 'newspapers']
['rolls/buns', 'pastry']
['rolls/buns', 'canned beer']
['sausage', 'rolls/buns']
['brown bread', 'rolls/buns']
['shopping bags', 'rolls/buns']
['napkins', 'rolls/buns']
['pork', 'rolls/buns']
['rolls/buns', 'whipped/sour cream']
['rolls/buns', 'domestic eggs']
['rolls/buns', 'frozen vegetables']
['bottled beer', 'bottled water']
['soda', 'bottled beer']
['white bread', 'soda']
['soda', 'bottled water']
['fruit/vegetable juice', 'bottled water']
['bottled water', 'newspapers']

['root vegetables', 'bottled water']
['sausage', 'bottled water']
['shopping bags', 'bottled water']
['soda', 'chocolate']
['curd', 'root vegetables']
['curd', 'whipped/sour cream']
['beef', 'root vegetables']
['soda', 'frankfurter']
['root vegetables', 'frankfurter']
['soda', 'fruit/vegetable juice']
['soda', 'newspapers']
['soda', 'pastry']
['soda', 'root vegetables']
['soda', 'canned beer']
['soda', 'sausage']
['soda', 'brown bread']
['soda', 'shopping bags']
['soda', 'napkins']
['soda', 'pork']
['soda', 'whipped/sour cream']
['soda', 'domestic eggs']
['root vegetables', 'chicken']
['root vegetables', 'fruit/vegetable juice']
['shopping bags', 'fruit/vegetable juice']
['root vegetables', 'newspapers']
['root vegetables', 'pastry']
['sausage', 'pastry']
['shopping bags', 'pastry']
['sausage', 'root vegetables']
['brown bread', 'root vegetables']
['shopping bags', 'root vegetables']
['pork', 'root vegetables']
['root vegetables', 'whipped/sour cream']
['root vegetables', 'domestic eggs']
['root vegetables', 'frozen vegetables']
['shopping bags', 'canned beer']
['brown bread', 'sausage']
['sausage', 'shopping bags']
['whole milk', 'yogurt', 'citrus fruit']
['whole milk', 'other vegetables', 'citrus fruit']

['root vegetables', 'other vegetables', 'citrus fruit']
['whole milk', 'tropical fruit', 'yogurt']
['tropical fruit', 'yogurt', 'other vegetables']
['whole milk', 'tropical fruit', 'other vegetables']
['whole milk', 'tropical fruit', 'rolls/buns']
['whole milk', 'tropical fruit', 'root vegetables']
['tropical fruit', 'root vegetables', 'other vegetables']
['whole milk', 'yogurt', 'other vegetables']
['whole milk', 'rolls/buns', 'yogurt']
['whole milk', 'soda', 'yogurt']
['whole milk', 'yogurt', 'root vegetables']
['whole milk', 'yogurt', 'whipped/sour cream']
['rolls/buns', 'yogurt', 'other vegetables']
['yogurt', 'other vegetables', 'root vegetables']
['yogurt', 'other vegetables', 'whipped/sour cream']
['whole milk', 'pip fruit', 'other vegetables']
['whole milk', 'butter', 'other vegetables']
['whole milk', 'rolls/buns', 'other vegetables']
['whole milk', 'bottled water', 'other vegetables']
['whole milk', 'soda', 'other vegetables']
['whole milk', 'fruit/vegetable juice', 'other vegetables']
['whole milk', 'other vegetables', 'pastry']
['whole milk', 'root vegetables', 'other vegetables']
['whole milk', 'sausage', 'other vegetables']
['whole milk', 'pork', 'other vegetables']
['whole milk', 'other vegetables', 'whipped/sour cream']
['whole milk', 'other vegetables', 'domestic eggs']
['whole milk', 'rolls/buns', 'root vegetables']
['rolls/buns', 'other vegetables', 'root vegetables']

Closed:326

['citrus fruit']
['semi-finished bread']
['margarine']
['tropical fruit']
['yogurt']
['coffee']

['whole milk']
['pip fruit']
['cream cheese']
['other vegetables']
['condensed milk']
['long life bakery product']
['butter']
['rolls/buns']
['UHT-milk']
['bottled beer']
['potted plants']
['white bread']
['bottled water']
['chocolate']
['curd']
['flour']
['dishes']
['beef']
['frankfurter']
['soda']
['chicken']
['sugar']
['fruit/vegetable juice']
['newspapers']
['packaged fruit/vegetables']
['specialty bar']
['butter milk']
['pastry']
['processed cheese']
['detergent']
['root vegetables']
['frozen dessert']
['salty snack']
['waffles']
['candy']
['canned beer']
['sausage']
['brown bread']
['shopping bags']
['beverages']

['hamburger meat']
['hygiene articles']
['napkins']
['pork']
['berries']
['whipped/sour cream']
['grapes']
['dessert']
['domestic eggs']
['spread cheese']
['misc. beverages']
['hard cheese']
['cat food']
['ham']
['baking powder']
['pickled vegetables']
['oil']
['chewing gum']
['ice cream']
['frozen vegetables']
['canned fish']
['seasonal products']
['red/blush wine']
['specialty chocolate']
['flower (seeds)']
['salt']
['frozen meals']
['canned vegetables']
['onions']
['herbs']
['white wine']
['sliced cheese']
['pasta']
['cling film/bags']
['soft cheese']
['cake bar']
['frozen fish']
['dish cleaner']
['meat']
['mustard']

['liquor']
['roll products']
['tropical fruit', 'citrus fruit']
['yogurt', 'citrus fruit']
['whole milk', 'citrus fruit']
['pip fruit', 'citrus fruit']
['other vegetables', 'citrus fruit']
['rolls/buns', 'citrus fruit']
['bottled water', 'citrus fruit']
['soda', 'citrus fruit']
['fruit/vegetable juice', 'citrus fruit']
['root vegetables', 'citrus fruit']
['sausage', 'citrus fruit']
['citrus fruit', 'whipped/sour cream']
['citrus fruit', 'domestic eggs']
['margarine', 'yogurt']
['margarine', 'whole milk']
['margarine', 'other vegetables']
['margarine', 'rolls/buns']
['margarine', 'bottled water']
['margarine', 'soda']
['margarine', 'root vegetables']
['tropical fruit', 'yogurt']
['whole milk', 'tropical fruit']
['tropical fruit', 'pip fruit']
['tropical fruit', 'other vegetables']
['tropical fruit', 'rolls/buns']
['tropical fruit', 'bottled water']
['tropical fruit', 'curd']
['soda', 'tropical fruit']
['tropical fruit', 'fruit/vegetable juice']
['tropical fruit', 'newspapers']
['tropical fruit', 'pastry']
['tropical fruit', 'root vegetables']
['sausage', 'tropical fruit']
['brown bread', 'tropical fruit']
['tropical fruit', 'shopping bags']
['tropical fruit', 'whipped/sour cream']
['tropical fruit', 'domestic eggs']
['whole milk', 'yogurt']

['pip fruit', 'yogurt']
['cream cheese', 'yogurt']
['yogurt', 'other vegetables']
['butter', 'yogurt']
['rolls/buns', 'yogurt']
['yogurt', 'bottled water']
['curd', 'yogurt']
['beef', 'yogurt']
['yogurt', 'frankfurter']
['soda', 'yogurt']
['yogurt', 'fruit/vegetable juice']
['yogurt', 'newspapers']
['yogurt', 'pastry']
['yogurt', 'root vegetables']
['sausage', 'yogurt']
['brown bread', 'yogurt']
['shopping bags', 'yogurt']
['napkins', 'yogurt']
['yogurt', 'berries']
['yogurt', 'whipped/sour cream']
['yogurt', 'domestic eggs']
['yogurt', 'frozen vegetables']
['whole milk', 'coffee']
['other vegetables', 'coffee']
['rolls/buns', 'coffee']
['whole milk', 'pip fruit']
['whole milk', 'cream cheese']
['whole milk', 'other vegetables']
['whole milk', 'long life bakery product']
['whole milk', 'butter']
['whole milk', 'rolls/buns']
['whole milk', 'bottled beer']
['whole milk', 'white bread']
['whole milk', 'bottled water']
['whole milk', 'chocolate']
['whole milk', 'curd']
['whole milk', 'beef']
['whole milk', 'frankfurter']
['whole milk', 'soda']
['whole milk', 'chicken']

['whole milk', 'sugar']
['whole milk', 'fruit/vegetable juice']
['whole milk', 'newspapers']
['whole milk', 'butter milk']
['whole milk', 'pastry']
['whole milk', 'root vegetables']
['whole milk', 'salty snack']
['whole milk', 'waffles']
['whole milk', 'sausage']
['whole milk', 'brown bread']
['whole milk', 'shopping bags']
['whole milk', 'hamburger meat']
['whole milk', 'hygiene articles']
['whole milk', 'napkins']
['whole milk', 'pork']
['whole milk', 'berries']
['whole milk', 'whipped/sour cream']
['whole milk', 'dessert']
['whole milk', 'domestic eggs']
['whole milk', 'ham']
['whole milk', 'oil']
['whole milk', 'frozen vegetables']
['whole milk', 'onions']
['whole milk', 'sliced cheese']
['pip fruit', 'other vegetables']
['pip fruit', 'rolls/buns']
['pip fruit', 'bottled water']
['soda', 'pip fruit']
['pip fruit', 'pastry']
['pip fruit', 'root vegetables']
['sausage', 'pip fruit']
['cream cheese', 'other vegetables']
['other vegetables', 'long life bakery product']
['butter', 'other vegetables']
['rolls/buns', 'other vegetables']
['bottled beer', 'other vegetables']
['white bread', 'other vegetables']
['bottled water', 'other vegetables']
['chocolate', 'other vegetables']
['curd', 'other vegetables']

['beef', 'other vegetables']
['other vegetables', 'frankfurter']
['soda', 'other vegetables']
['other vegetables', 'chicken']
['other vegetables', 'sugar']
['fruit/vegetable juice', 'other vegetables']
['other vegetables', 'newspapers']
['butter milk', 'other vegetables']
['other vegetables', 'pastry']
['root vegetables', 'other vegetables']
['salty snack', 'other vegetables']
['sausage', 'other vegetables']
['brown bread', 'other vegetables']
['shopping bags', 'other vegetables']
['hamburger meat', 'other vegetables']
['napkins', 'other vegetables']
['pork', 'other vegetables']
['other vegetables', 'berries']
['other vegetables', 'whipped/sour cream']
['dessert', 'other vegetables']
['other vegetables', 'domestic eggs']
['frozen vegetables', 'other vegetables']
['onions', 'other vegetables']
['butter', 'rolls/buns']
['butter', 'root vegetables']
['butter', 'whipped/sour cream']
['bottled beer', 'rolls/buns']
['rolls/buns', 'bottled water']
['chocolate', 'rolls/buns']
['beef', 'rolls/buns']
['rolls/buns', 'frankfurter']
['soda', 'rolls/buns']
['rolls/buns', 'fruit/vegetable juice']
['rolls/buns', 'newspapers']
['rolls/buns', 'pastry']
['rolls/buns', 'root vegetables']
['rolls/buns', 'canned beer']
['sausage', 'rolls/buns']
['brown bread', 'rolls/buns']
['shopping bags', 'rolls/buns']

['napkins', 'rolls/buns']
['pork', 'rolls/buns']
['rolls/buns', 'whipped/sour cream']
['rolls/buns', 'domestic eggs']
['rolls/buns', 'frozen vegetables']
['bottled beer', 'bottled water']
['soda', 'bottled beer']
['white bread', 'soda']
['soda', 'bottled water']
['fruit/vegetable juice', 'bottled water']
['bottled water', 'newspapers']
['root vegetables', 'bottled water']
['sausage', 'bottled water']
['shopping bags', 'bottled water']
['soda', 'chocolate']
['curd', 'root vegetables']
['curd', 'whipped/sour cream']
['beef', 'root vegetables']
['soda', 'frankfurter']
['root vegetables', 'frankfurter']
['soda', 'fruit/vegetable juice']
['soda', 'newspapers']
['soda', 'pastry']
['soda', 'root vegetables']
['soda', 'canned beer']
['soda', 'sausage']
['soda', 'brown bread']
['soda', 'shopping bags']
['soda', 'napkins']
['soda', 'pork']
['soda', 'whipped/sour cream']
['soda', 'domestic eggs']
['root vegetables', 'chicken']
['root vegetables', 'fruit/vegetable juice']
['shopping bags', 'fruit/vegetable juice']
['root vegetables', 'newspapers']
['root vegetables', 'pastry']
['sausage', 'pastry']
['shopping bags', 'pastry']
['sausage', 'root vegetables']

['brown bread', 'root vegetables']
['shopping bags', 'root vegetables']
['pork', 'root vegetables']
['root vegetables', 'whipped/sour cream']
['root vegetables', 'domestic eggs']
['root vegetables', 'frozen vegetables']
['shopping bags', 'canned beer']
['brown bread', 'sausage']
['sausage', 'shopping bags']
['whole milk', 'yogurt', 'citrus fruit']
['whole milk', 'other vegetables', 'citrus fruit']
['root vegetables', 'other vegetables', 'citrus fruit']
['whole milk', 'tropical fruit', 'yogurt']
['tropical fruit', 'yogurt', 'other vegetables']
['whole milk', 'tropical fruit', 'other vegetables']
['whole milk', 'tropical fruit', 'rolls/buns']
['whole milk', 'tropical fruit', 'root vegetables']
['tropical fruit', 'root vegetables', 'other vegetables']
['whole milk', 'yogurt', 'other vegetables']
['whole milk', 'rolls/buns', 'yogurt']
['whole milk', 'soda', 'yogurt']
['whole milk', 'yogurt', 'root vegetables']
['whole milk', 'yogurt', 'whipped/sour cream']
['rolls/buns', 'yogurt', 'other vegetables']
['yogurt', 'other vegetables', 'root vegetables']
['yogurt', 'other vegetables', 'whipped/sour cream']
['whole milk', 'pip fruit', 'other vegetables']
['whole milk', 'butter', 'other vegetables']
['whole milk', 'rolls/buns', 'other vegetables']
['whole milk', 'bottled water', 'other vegetables']
['whole milk', 'soda', 'other vegetables']
['whole milk', 'fruit/vegetable juice', 'other vegetables']
['whole milk', 'other vegetables', 'pastry']
['whole milk', 'root vegetables', 'other vegetables']
['whole milk', 'sausage', 'other vegetables']
['whole milk', 'pork', 'other vegetables']
['whole milk', 'other vegetables', 'whipped/sour cream']
['whole milk', 'other vegetables', 'domestic eggs']
['whole milk', 'rolls/buns', 'root vegetables']
['rolls/buns', 'other vegetables', 'root vegetables']

Minimum Support: 200

Confidence=20

MAXIMAL:

90

['coffee']

['cream cheese']

['long life bakery product']

['UHT-milk']

['white bread']

['chocolate']

['chicken']

['sugar']

['specialty bar']

['butter milk']

['salty snack']

['waffles']

['candy']

['canned beer']

['beverages']

['hamburger meat']

['hygiene articles']

['napkins']

['berries']

['grapes']

['dessert']

['misc. beverages']

['hard cheese']

['cat food']

['ham']

['oil']

['chewing gum']

['ice cream']

['specialty chocolate']

['frozen meals']

['onions']

['sliced cheese']

['meat']

['yogurt', 'citrus fruit']

['citrus fruit', 'whole milk']

['other vegetables', 'citrus fruit']
['margarine', 'whole milk']
['tropical fruit', 'yogurt']
['tropical fruit', 'whole milk']
['tropical fruit', 'pip fruit']
['tropical fruit', 'other vegetables']
['tropical fruit', 'rolls/buns']
['tropical fruit', 'soda']
['tropical fruit', 'root vegetables']
['yogurt', 'rolls/buns']
['yogurt', 'bottled water']
['yogurt', 'soda']
['yogurt', 'root vegetables']
['yogurt', 'whipped/sour cream']
['pip fruit', 'whole milk']
['butter', 'whole milk']
['rolls/buns', 'whole milk']
['bottled beer', 'whole milk']
['bottled water', 'whole milk']
['curd', 'whole milk']
['beef', 'whole milk']
['frankfurter', 'whole milk']
['soda', 'whole milk']
['fruit/vegetable juice', 'whole milk']
['whole milk', 'newspapers']
['pastry', 'whole milk']
['sausage', 'whole milk']
['brown bread', 'whole milk']
['shopping bags', 'whole milk']
['pork', 'whole milk']
['whipped/sour cream', 'whole milk']
['domestic eggs', 'whole milk']
['frozen vegetables', 'whole milk']
['pip fruit', 'other vegetables']
['rolls/buns', 'other vegetables']
['other vegetables', 'bottled water']
['soda', 'other vegetables']
['fruit/vegetable juice', 'other vegetables']
['pastry', 'other vegetables']
['other vegetables', 'sausage']

['shopping bags', 'other vegetables']
['other vegetables', 'pork']
['other vegetables', 'whipped/sour cream']
['other vegetables', 'domestic eggs']
['rolls/buns', 'bottled water']
['rolls/buns', 'soda']
['rolls/buns', 'pastry']
['rolls/buns', 'root vegetables']
['rolls/buns', 'sausage']
['soda', 'bottled water']
['soda', 'pastry']
['soda', 'sausage']
['shopping bags', 'soda']
['yogurt', 'other vegetables', 'whole milk']
['other vegetables', 'whole milk', 'root vegetables']

Closed:

121

['citrus fruit']
['margarine']
['tropical fruit']
['yogurt']
['coffee']
['whole milk']
['pip fruit']
['cream cheese']
['other vegetables']
['long life bakery product']
['butter']
['rolls/buns']
['UHT-milk']
['bottled beer']
['white bread']
['bottled water']
['chocolate']
['curd']
['beef']
['frankfurter']
['soda']

['chicken']
['sugar']
['fruit/vegetable juice']
['newspapers']
['specialty bar']
['butter milk']
['pastry']
['root vegetables']
['salty snack']
['waffles']
['candy']
['canned beer']
['sausage']
['brown bread']
['shopping bags']
['beverages']
['hamburger meat']
['hygiene articles']
['napkins']
['pork']
['berries']
['whipped/sour cream']
['grapes']
['dessert']
['domestic eggs']
['misc. beverages']
['hard cheese']
['cat food']
['ham']
['oil']
['chewing gum']
['ice cream']
['frozen vegetables']
['specialty chocolate']
['frozen meals']
['onions']
['sliced cheese']
['meat']
['yogurt', 'citrus fruit']
['citrus fruit', 'whole milk']

['other vegetables', 'citrus fruit']
['margarine', 'whole milk']
['tropical fruit', 'yogurt']
['tropical fruit', 'whole milk']
['tropical fruit', 'pip fruit']
['tropical fruit', 'other vegetables']
['tropical fruit', 'rolls/buns']
['tropical fruit', 'soda']
['tropical fruit', 'root vegetables']
['yogurt', 'whole milk']
['yogurt', 'other vegetables']
['yogurt', 'rolls/buns']
['yogurt', 'bottled water']
['yogurt', 'soda']
['yogurt', 'root vegetables']
['yogurt', 'whipped/sour cream']
['pip fruit', 'whole milk']
['other vegetables', 'whole milk']
['butter', 'whole milk']
['rolls/buns', 'whole milk']
['bottled beer', 'whole milk']
['bottled water', 'whole milk']
['curd', 'whole milk']
['beef', 'whole milk']
['frankfurter', 'whole milk']
['soda', 'whole milk']
['fruit/vegetable juice', 'whole milk']
['whole milk', 'newspapers']
['pastry', 'whole milk']
['root vegetables', 'whole milk']
['sausage', 'whole milk']
['brown bread', 'whole milk']
['shopping bags', 'whole milk']
['pork', 'whole milk']
['whipped/sour cream', 'whole milk']
['domestic eggs', 'whole milk']
['frozen vegetables', 'whole milk']
['pip fruit', 'other vegetables']
['rolls/buns', 'other vegetables']
['other vegetables', 'bottled water']

['soda', 'other vegetables']
['fruit/vegetable juice', 'other vegetables']
['pastry', 'other vegetables']
['other vegetables', 'root vegetables']
['other vegetables', 'sausage']
['shopping bags', 'other vegetables']
['other vegetables', 'pork']
['other vegetables', 'whipped/sour cream']
['other vegetables', 'domestic eggs']
['rolls/buns', 'bottled water']
['rolls/buns', 'soda']
['rolls/buns', 'pastry']
['rolls/buns', 'root vegetables']
['rolls/buns', 'sausage']
['soda', 'bottled water']
['soda', 'pastry']
['soda', 'sausage']
['shopping bags', 'soda']
['yogurt', 'other vegetables', 'whole milk']
['other vegetables', 'whole milk', 'root vegetables']

Minimum support::500

Confidence: 20

Maximal sets(27):

['citrus fruit']
['margarine']
['tropical fruit']
['coffee']
['pip fruit']
['butter']
['bottled beer']
['bottled water']
['curd']
['beef']
['frankfurter']
['soda']
['fruit/vegetable juice']
['newspapers']
['pastry']
['root vegetables']
['canned beer']
['sausage']
['brown bread']
['shopping bags']
['napkins']
['pork']
['whipped/sour cream']
['domestic eggs']
['whole milk', 'yogurt']
['whole milk', 'other vegetables']
['rolls/buns', 'whole milk']

Closed sets:

31

['citrus fruit']
['margarine']

['tropical fruit']
['yogurt']
['coffee']
['whole milk']
['pip fruit']
['other vegetables']
['butter']
['rolls/buns']
['bottled beer']
['bottled water']
['curd']
['beef']
['frankfurter']
['soda']
['fruit/vegetable juice']
['newspapers']
['pastry']
['root vegetables']
['canned beer']
['sausage']
['brown bread']
['shopping bags']
['napkins']
['pork']
['whipped/sour cream']
['domestic eggs']
['yogurt', 'whole milk']
['other vegetables', 'whole milk']
['rolls/buns', 'whole milk']

Regarding Redundant Rules:

As Seen above the Closed Itemset and Frequent Items sets are the same there will be no redundant rules in this data set.