Homework 8

Jane Downer

Part 2.1-A

Completed in Python (files attached).

Part 2.1-B

Frequent Items: 1k Data

Itemset	Support
{Gongolais Cookie}	0.108
{Truffle Cake}	0.103
{Tuile Cookie}	0.102
{Berry Tart}	0.095
{Coffee Eclair}	0.093
{Strawberry Cake}	0.091
{Marzipan Cookie}	0.090
{Napoleon Cake}	0.090
{Apple Croissant}	0.090
{Hot Coffee}	0.087
{Lemon Cake}	0.085
{Chocolate Cake}	0.084
{Cherry Tart}	0.084
{Raspberry Cookie}	0.082
{Blueberry Tart}	0.081
{Apple Danish}	0.081
{Apple Tart}	0.079
{Opera Cake}	0.078
{Orange Juice}	0.077
{Cheese Croissant}	0.077
{Lemon Tart}	0.076
{Apricot Croissant}	0.076
{Chocolate Coffee}	0.075
{Bottled Water}	0.074
{Apricot Danish}	0.074
{Blackberry Tart}	0.073
{Casino Cake}	0.072
{Vanilla Frappuccino}	0.069
{Cherry Soda}	0.069
{Raspberry Lemonade}	0.069
{Apple Pie}	0.068
{Lemon Cookie}	0.066
{Almond Twist}	0.064

Itemset	Support
{Lemon Lemonade}	0.063
{Green Tea}	0.062
{Walnut Cookie}	0.061
{Gongolais Cookie,Truffle Cake}	0.058
{Apricot Tart}	0.056
{Marzipan Cookie,Tuile Cookie}	0.053
{Single Espresso}	0.052
{Chocolate Tart}	0.051
{Blueberry Danish}	0.051
{Napoleon Cake,Strawberry Cake}	0.049
{Almond Croissant}	0.048
{Vanilla Meringue}	0.047
{Apricot Danish,Cherry Tart}	0.045
{Apple Croissant,Apple Tart}	0.044
{Ganache Cookie}	0.043
{Chocolate Cake,Chocolate Coffee}	0.043
{Chocolate Croissant}	0.042
{Almond Tart}	0.041
{Cherry Tart,Opera Cake}	0.041
{Pecan Tart}	0.040
{Lemon Cake,Lemon Tart}	0.040
{Casino Cake,Chocolate Cake}	0.040
{Apricot Croissant,Blueberry Tart}	0.040
{Apple Croissant,Apple Danish}	0.040
{Apricot Danish,Opera Cake}	0.039
{Apple Danish,Apple Tart}	0.039
{Chocolate Meringue}	0.038
{Apricot Danish,Cherry Tart,Opera Cake}	0.038
{Apple Croissant,Apple Danish,Apple Tart}	0.038
{Vanilla Eclair}	0.037
{Cheese Croissant,Orange Juice}	0.037
{Casino Cake,Chocolate Coffee}	0.035
{Chocolate Eclair}	0.034
{Berry Tart,Bottled Water}	0.034
{Casino Cake,Chocolate Cake,Chocolate Coffee}	0.034
{Apple Pie,Coffee Eclair}	0.033
{Apple Tart,Cherry Soda}	0.033
{Lemon Cookie,Raspberry Cookie}	0.033
{Blueberry Tart,Hot Coffee}	0.032
{Lemon Cookie,Lemon Lemonade}	0.031
{Blackberry Tart,Coffee Eclair}	0.031
{Apricot Croissant,Hot Coffee}	0.031

Itemset	Support
{Apricot Croissant,Blueberry Tart,Hot Coffee}	0.031
{Almond Twist,Coffee Eclair}	0.030
{Apple Danish,Cherry Soda}	0.030
{Apple Croissant,Cherry Soda}	0.030
{Lemon Lemonade,Raspberry Lemonade}	0.029
{Lemon Lemonade,Raspberry Cookie}	0.029
{Almond Twist,Apple Pie}	0.029
{Lemon Cookie,Raspberry Lemonade}	0.029
{Raspberry Cookie,Raspberry Lemonade}	0.029
{Apple Danish,Apple Tart,Cherry Soda}	0.029
{Apple Croissant,Apple Tart,Cherry Soda}	0.029
{Apple Croissant,Apple Danish,Cherry Soda}	0.029
{Lemon Cookie,Raspberry Cookie,Raspberry Lemonade}	0.029
{Apple Croissant,Apple Danish,Apple Tart,Cherry Soda}	0.029
{Lemon Cookie,Lemon Lemonade,Raspberry Lemonade}	0.028
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie}	0.028
{Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	0.028
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	0.028
{Almond Twist,Apple Pie,Coffee Eclair}	0.027
{Almond Bear Claw}	0.026
{Chocolate Tart,Vanilla Frappuccino}	0.026
{Apple Pie,Hot Coffee}	0.026

Frequent Items: 5k Data

Itemset	Support
{Coffee Eclair}	0.1108
{Tuile Cookie}	0.0960
{Strawberry Cake}	0.0960
{Gongolais Cookie}	0.0950
{Cherry Tart}	0.0920
{Hot Coffee}	0.0892
{Truffle Cake}	0.0876
{Lemon Cake}	0.0850
{Blueberry Tart}	0.0850
{Opera Cake}	0.0836
{Orange Juice}	0.0818
{Napoleon Cake}	0.0818
{Marzipan Cookie}	0.0814
{Apricot Danish}	0.0810
{Chocolate Cake}	0.0798
{Apricot Croissant}	0.0794
{Apple Pie}	0.0782

Itemset	Support
{Berry Tart}	0.0778
{Chocolate Tart}	0.0758
{Blackberry Tart}	0.0754
{Almond Twist}	0.0748
{Casino Cake}	0.0746
{Cheese Croissant}	0.0738
{Apple Tart}	0.0734
{Apple Croissant}	0.0712
{Apple Danish}	0.0710
{Lemon Tart}	0.0708
{Chocolate Coffee}	0.0700
{Walnut Cookie}	0.0700
{Bottled Water}	0.0656
{Raspberry Cookie}	0.0636
{Lemon Cookie}	0.0630
{Raspberry Lemonade}	0.0600
{Vanilla Frappuccino}	0.0594
{Lemon Lemonade}	0.0594
{Cherry Soda}	0.0564
{Single Espresso}	0.0538
{Green Tea}	0.0524
{Marzipan Cookie,Tuile Cookie}	0.0484
{Gongolais Cookie,Truffle Cake}	0.0470
{Apricot Danish,Cherry Tart}	0.0462
{Vanilla Eclair}	0.0460
{Chocolate Meringue}	0.0444
{Pecan Tart}	0.0442
{Cherry Tart,Opera Cake}	0.0436
{Apricot Croissant,Blueberry Tart}	0.0430
{Almond Croissant}	0.0426
{Apricot Tart}	0.0422
{Napoleon Cake,Strawberry Cake}	0.0422
{Apple Pie,Coffee Eclair}	0.0406
{Cheese Croissant,Orange Juice}	0.0398
{Apricot Danish,Opera Cake}	0.0392
{Almond Tart}	0.0386
{Vanilla Meringue}	0.0386
{Ganache Cookie}	0.0386
{Chocolate Croissant}	0.0384
{Chocolate Eclair}	0.0382
{Almond Bear Claw}	0.0378
{Almond Twist,Coffee Eclair}	0.0378

Itemset	Support
{Apricot Danish,Cherry Tart,Opera Cake}	0.0374
{Chocolate Cake,Chocolate Coffee}	0.0370
{Almond Twist,Apple Pie}	0.0366
{Almond Twist,Apple Pie,Coffee Eclair}	0.0356
{Blackberry Tart,Coffee Eclair}	0.0350
{Casino Cake,Chocolate Cake}	0.0342
{Lemon Cake,Lemon Tart}	0.0336
{Blueberry Danish}	0.0332
{Chocolate Tart,Vanilla Frappuccino}	0.0326
{Berry Tart,Bottled Water}	0.0324
{Casino Cake,Chocolate Coffee}	0.0316
{Apple Croissant,Apple Tart}	0.0314
{Apple Croissant,Apple Danish}	0.0308
{Apple Danish,Apple Tart}	0.0308
{Apricot Croissant,Hot Coffee}	0.0308
{Almond Twist,Hot Coffee}	0.0304
{Blueberry Tart,Hot Coffee}	0.0302
{Coffee Eclair,Hot Coffee}	0.0298
{Apricot Croissant,Blueberry Tart,Hot Coffee}	0.0296
{Casino Cake,Chocolate Cake,Chocolate Coffee}	0.0294
{Apple Pie,Hot Coffee}	0.0292
{Chocolate Tart,Walnut Cookie}	0.0284
{Lemon Cookie,Raspberry Cookie}	0.0284
{Apple Croissant,Apple Danish,Apple Tart}	0.0284
{Almond Twist,Apple Pie,Hot Coffee}	0.0280
{Almond Twist,Coffee Eclair,Hot Coffee}	0.0280
{Apple Pie,Coffee Eclair,Hot Coffee}	0.0280
{Almond Twist,Apple Pie,Coffee Eclair,Hot Coffee}	0.0280
{Blackberry Tart,Single Espresso}	0.0276
{Raspberry Cookie,Raspberry Lemonade}	0.0272
{Lemon Cookie,Lemon Lemonade}	0.0270
{Lemon Lemonade,Raspberry Cookie}	0.0268
{Vanilla Frappuccino,Walnut Cookie}	0.0266
{Lemon Lemonade,Raspberry Lemonade}	0.0262
{Coffee Eclair,Single Espresso}	0.0258
{Lemon Cookie,Raspberry Lemonade}	0.0258
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie}	0.0258
{Blackberry Tart,Coffee Eclair,Single Espresso}	0.0256
{Chocolate Tart,Vanilla Frappuccino,Walnut Cookie}	0.0252
{Lemon Cookie,Lemon Lemonade,Raspberry Lemonade}	0.0252
{Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	0.0252
{Lemon Cookie,Raspberry Cookie,Raspberry Lemonade}	0.0252

Itemset	Support
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	0.0252

Frequent Items: 20k Data

Itemset	Support
{Coffee Eclair}	0.10985
{Hot Coffee}	0.10125
{Tuile Cookie}	0.09860
{Apricot Danish}	0.09220
{Strawberry Cake}	0.09200
{Gongolais Cookie}	0.09185
{Orange Juice}	0.09160
{Cherry Tart}	0.09125
{Marzipan Cookie}	0.08640
{Lemon Cake}	0.08600
{Truffle Cake}	0.08465
{Napoleon Cake}	0.08450
{Berry Tart}	0.08430
{Blueberry Tart}	0.08390
{Chocolate Cake}	0.08365
{Opera Cake}	0.08365
{Apricot Croissant}	0.08165
{Cheese Croissant}	0.08160
{Chocolate Coffee}	0.07950
{Blackberry Tart}	0.07670
{Chocolate Tart}	0.07635
{Lemon Tart}	0.07595
{Casino Cake}	0.07530
{Vanilla Frappuccino}	0.07425
{Apple Pie}	0.07415
{Almond Twist}	0.07275
{Bottled Water}	0.07125
{Apple Croissant}	0.07085
{Walnut Cookie}	0.06950
{Raspberry Cookie}	0.06945
{Apple Tart}	0.06925
{Single Espresso}	0.06850
{Lemon Cookie}	0.06820
{Raspberry Lemonade}	0.06770
{Apple Danish}	0.06750
{Lemon Lemonade}	0.06605
{Cherry Soda}	0.06230
{Green Tea}	0.06100

Itemset	Support
{Apricot Danish,Cherry Tart}	0.05235
{Marzipan Cookie,Tuile Cookie}	0.04850
{Napoleon Cake,Strawberry Cake}	0.04455
{Chocolate Meringue}	0.04445
{Chocolate Croissant}	0.04445
{Almond Bear Claw}	0.04400
{Cheese Croissant,Orange Juice}	0.04370
{Cherry Tart,Opera Cake}	0.04365
{Gongolais Cookie,Truffle Cake}	0.04335
{Ganache Cookie}	0.04330
{Apricot Danish,Opera Cake}	0.04320
{Chocolate Cake,Chocolate Coffee}	0.04305
{Apricot Tart}	0.04275
{Vanilla Eclair}	0.04270
{Chocolate Eclair}	0.04260
{Vanilla Meringue}	0.04240
{Almond Croissant}	0.04205
{Apricot Croissant,Blueberry Tart}	0.04185
{Pecan Tart}	0.04155
{Apricot Danish,Cherry Tart,Opera Cake}	0.04090
{Blueberry Danish}	0.04065
{Almond Tart}	0.04055
{Apple Pie,Coffee Eclair}	0.03725
{Lemon Cake,Lemon Tart}	0.03700
{Blackberry Tart,Coffee Eclair}	0.03675
{Almond Twist,Coffee Eclair}	0.03615
{Casino Cake,Chocolate Cake}	0.03585
{Almond Twist,Apple Pie}	0.03585
{Chocolate Tart,Vanilla Frappuccino}	0.03580
{Berry Tart,Bottled Water}	0.03535
{Casino Cake,Chocolate Coffee}	0.03505
{Blueberry Tart,Hot Coffee}	0.03475
{Apricot Croissant,Hot Coffee}	0.03425
{Almond Twist,Apple Pie,Coffee Eclair}	0.03410
{Casino Cake,Chocolate Cake,Chocolate Coffee}	0.03345
{Apricot Croissant,Blueberry Tart,Hot Coffee}	0.03190
{Coffee Eclair,Hot Coffee}	0.03115
{Chocolate Tart,Walnut Cookie}	0.03055
{Vanilla Frappuccino,Walnut Cookie}	0.03030
{Almond Twist,Hot Coffee}	0.03020
{Apple Pie,Hot Coffee}	0.03010
{Blackberry Tart,Single Espresso}	0.02935

Itemset	Support
{Apple Croissant,Apple Tart}	0.02865
{Apple Croissant,Apple Danish}	0.02860
{Coffee Eclair,Single Espresso}	0.02850
{Lemon Cookie,Raspberry Cookie}	0.02845
{Lemon Cookie,Raspberry Lemonade}	0.02815
{Apple Danish,Apple Tart}	0.02810
{Almond Twist,Apple Pie,Hot Coffee}	0.02795
{Lemon Lemonade,Raspberry Cookie}	0.02790
{Almond Twist,Coffee Eclair,Hot Coffee}	0.02785
{Apple Pie,Coffee Eclair,Hot Coffee}	0.02785
{Almond Twist,Apple Pie,Coffee Eclair,Hot Coffee}	0.02785
{Lemon Cookie,Lemon Lemonade}	0.02775
{Chocolate Tart,Vanilla Frappuccino,Walnut Cookie}	0.02775
{Raspberry Cookie,Raspberry Lemonade}	0.02760
{Lemon Lemonade,Raspberry Lemonade}	0.02660
{Blackberry Tart,Coffee Eclair,Single Espresso}	0.02640
{Apple Croissant,Apple Danish,Apple Tart}	0.02600
{Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	0.02555
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie}	0.02555
{Lemon Cookie,Raspberry Cookie,Raspberry Lemonade}	0.02550
{Lemon Cookie,Lemon Lemonade,Raspberry Lemonade}	0.02545
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	0.02535

Frequent Items: 75k Data

Itemset	Support
{Coffee Eclair}	0.1092133
{Strawberry Cake}	0.0926267
{Tuile Cookie}	0.0912533
{Cherry Tart}	0.0910933
{Gongolais Cookie}	0.0859200
{Berry Tart}	0.0840667
{Marzipan Cookie}	0.0838800
{Lemon Cake}	0.0836133
{Chocolate Cake}	0.0835333
{Napoleon Cake}	0.0824933
{Truffle Cake}	0.0822400
{Opera Cake}	0.0820933
{Blueberry Tart}	0.0819467
{Apricot Danish}	0.0772533
{Apple Pie}	0.0768800
{Hot Coffee}	0.0756933
{Casino Cake}	0.0750133

Itemset	Support
{Blackberry Tart}	0.0749200
{Apricot Croissant}	0.0741733
{Lemon Tart}	0.0729467
{Chocolate Tart}	0.0726400
{Cheese Croissant}	0.0725467
{Orange Juice}	0.0716933
{Apple Tart}	0.0678933
{Lemon Cookie}	0.0647200
{Raspberry Cookie}	0.0640800
{Almond Twist}	0.0631333
{Walnut Cookie}	0.0610400
{Apple Croissant}	0.0600933
{Chocolate Coffee}	0.0597467
{Bottled Water}	0.0556400
{Apple Danish}	0.0547600
{Lemon Lemonade}	0.0545600
{Vanilla Frappuccino}	0.0541867
{Raspberry Lemonade}	0.0520000
{Marzipan Cookie,Tuile Cookie}	0.0464667
{Single Espresso}	0.0463200
{Apricot Danish,Cherry Tart}	0.0453200
{Napoleon Cake,Strawberry Cake}	0.0429600
{Vanilla Eclair}	0.0424667
{Cherry Tart,Opera Cake}	0.0423867
{Chocolate Eclair}	0.0423733
{Apricot Tart}	0.0419600
{Almond Tart}	0.0417600
{Gongolais Cookie,Truffle Cake}	0.0416267
{Pecan Tart}	0.0413333
{Ganache Cookie}	0.0410800
{Cherry Soda}	0.0410400
{Apricot Croissant,Blueberry Tart}	0.0399333
{Vanilla Meringue}	0.0382133
{Chocolate Meringue}	0.0380000
{Apple Pie,Coffee Eclair}	0.0371867
{Apricot Danish,Opera Cake}	0.0361867
{Blackberry Tart,Coffee Eclair}	0.0359600
{Cheese Croissant,Orange Juice}	0.0358533
{Almond Croissant}	0.0357333
{Casino Cake,Chocolate Cake}	0.0355333
{Lemon Cake,Lemon Tart}	0.0354267
{Apricot Danish,Cherry Tart,Opera Cake}	0.0350533

Itemset	Support
{Chocolate Cake,Chocolate Coffee}	0.0345600
{Chocolate Croissant}	0.0342667
{Almond Twist,Coffee Eclair}	0.0325867
{Blueberry Danish}	0.0325333
{Almond Twist,Apple Pie}	0.0324533
{Almond Twist,Apple Pie,Coffee Eclair}	0.0311067
{Almond Bear Claw}	0.0306667
{Berry Tart,Bottled Water}	0.0304667
{Chocolate Tart,Vanilla Frappuccino}	0.0283200
{Green Tea}	0.0278933
{Casino Cake,Chocolate Coffee}	0.0275867
{Lemon Cookie,Raspberry Cookie}	0.0273733
{Apricot Croissant,Hot Coffee}	0.0273600
{Blueberry Tart,Hot Coffee}	0.0271333
{Chocolate Tart,Walnut Cookie}	0.0270800
{Casino Cake,Chocolate Cake,Chocolate Coffee}	0.0268533
{Apple Croissant,Apple Tart}	0.0264267
{Apricot Croissant,Blueberry Tart,Hot Coffee}	0.0262667
{Lemon Cookie,Lemon Lemonade}	0.0256000
{Lemon Lemonade,Raspberry Cookie}	0.0255600

Rules: 1k Data

Antecedent	Consequent	Support	Confidence
{Lemon Cookie,Lemon Lemonade}	{Raspberry Lemonade}	0.028	0.903
{Lemon Lemonade,Raspberry Lemonade}	{Lemon Cookie}	0.028	0.966
{Lemon Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.028	0.966
{Lemon Cookie,Lemon Lemonade}	{Raspberry Cookie}	0.028	0.903
{Lemon Lemonade,Raspberry Cookie}	{Lemon Cookie}	0.028	0.966
{Lemon Lemonade,Raspberry Lemonade}	{Raspberry Cookie}	0.028	0.966
{Lemon Lemonade,Raspberry Cookie}	{Raspberry Lemonade}	0.028	0.966
{Raspberry Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.028	0.966
{Almond Twist,Apple Pie}	{Coffee Eclair}	0.027	0.931
{Almond Twist,Coffee Eclair}	{Apple Pie}	0.027	0.900
{Apple Danish,Cherry Soda}	{Apple Tart}	0.029	0.967
{Apple Croissant,Cherry Soda}	{Apple Tart}	0.029	0.967
{Apple Danish,Cherry Soda}	{Apple Croissant}	0.029	0.967
{Apple Croissant,Cherry Soda}	{Apple Danish}	0.029	0.967
{Casino Cake,Chocolate Coffee}	{Chocolate Cake}	0.034	0.971

Antecedent	Consequent	Support	Confidence
{Apricot Croissant,Hot Coffee}	{Blueberry Tart}	0.031	1.000
{Blueberry Tart,Hot Coffee}	{Apricot Croissant}	0.031	0.969
{Lemon Cookie,Raspberry Lemonade}	{Raspberry Cookie}	0.029	1.000
{Raspberry Cookie,Raspberry Lemonade}	{Lemon Cookie}	0.029	1.000
{Apricot Danish,Opera Cake}	{Cherry Tart}	0.038	0.974
{Cherry Tart,Opera Cake}	{Apricot Danish}	0.038	0.927
{Apple Danish,Apple Tart}	{Apple Croissant}	0.038	0.974
{Apple Croissant,Apple Danish}	{Apple Tart}	0.038	0.950
{Lemon Cookie,Lemon Lemonade,Raspberry Lemonade}	{Raspberry Cookie}	0.028	1.000
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie}	{Raspberry Lemonade}	0.028	1.000
{Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	{Lemon Cookie}	0.028	1.000
{Lemon Cookie,Raspberry Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.028	0.966
{Apple Danish,Apple Tart,Cherry Soda}	{Apple Croissant}	0.029	1.000
{Apple Croissant,Apple Tart,Cherry Soda}	{Apple Danish}	0.029	1.000
{Apple Croissant,Apple Danish,Cherry Soda}	{Apple Tart}	0.029	1.000

Rules: 5k Data

Antecedent	Consequent	Support	Confidence
{Blackberry Tart,Single Espresso}	{Coffee Eclair}	0.026	0.928
{Coffee Eclair,Single Espresso}	{Blackberry Tart}	0.026	0.992
{Vanilla Frappuccino,Walnut Cookie}	{Chocolate Tart}	0.025	0.947
{Lemon Lemonade,Raspberry Lemonade}	{Lemon Cookie}	0.025	0.962
{Lemon Cookie,Lemon Lemonade}	{Raspberry Lemonade}	0.025	0.933
{Lemon Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.025	0.977
{Lemon Lemonade,Raspberry Lemonade}	{Raspberry Cookie}	0.025	0.962
{Lemon Lemonade,Raspberry Cookie}	{Raspberry Lemonade}	0.025	0.940
{Raspberry Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.025	0.926
{Lemon Cookie,Lemon Lemonade}	{Raspberry Cookie}	0.026	0.956
{Lemon Lemonade,Raspberry Cookie}	{Lemon Cookie}	0.026	0.963
{Lemon Cookie,Raspberry Cookie}	{Lemon Lemonade}	0.026	0.908
{Casino Cake,Chocolate Coffee}	{Chocolate Cake}	0.029	0.930
{Lemon Cookie,Raspberry Lemonade}	{Raspberry Cookie}	0.025	0.977
{Raspberry Cookie,Raspberry Lemonade}	{Lemon Cookie}	0.025	0.926
{Apple Croissant,Apple Danish}	{Apple Tart}	0.028	0.922

Antecedent	Consequent	Support	Confidence
{Apple Danish,Apple Tart}	{Apple Croissant}	0.028	0.922
{Apple Croissant,Apple Tart}	{Apple Danish}	0.028	0.904
{Apricot Danish,Opera Cake}	{Cherry Tart}	0.037	0.954
{Apricot Croissant,Hot Coffee}	{Blueberry Tart}	0.030	0.961
{Blueberry Tart,Hot Coffee}	{Apricot Croissant}	0.030	0.980
{Almond Twist,Hot Coffee}	{Apple Pie}	0.028	0.921
{Apple Pie,Hot Coffee}	{Almond Twist}	0.028	0.959
{Almond Twist,Apple Pie}	{Coffee Eclair}	0.036	0.973
{Almond Twist,Coffee Eclair}	{Apple Pie}	0.036	0.942
{Almond Twist,Hot Coffee}	{Coffee Eclair}	0.028	0.921
{Coffee Eclair,Hot Coffee}	{Almond Twist}	0.028	0.940
{Apple Pie,Hot Coffee}	{Coffee Eclair}	0.028	0.959
{Coffee Eclair,Hot Coffee}	{Apple Pie}	0.028	0.940
{Lemon Cookie,Lemon Lemonade,Raspberry Lemonade}	{Raspberry Cookie}	0.025	1.000
{Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	{Lemon Cookie}	0.025	1.000
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie}	{Raspberry Lemonade}	0.025	0.977
{Lemon Cookie,Raspberry Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.025	1.000
{Almond Twist,Apple Pie,Hot Coffee}	{Coffee Eclair}	0.028	1.000
{Almond Twist,Coffee Eclair,Hot Coffee}	{Apple Pie}	0.028	1.000
{Apple Pie,Coffee Eclair,Hot Coffee}	{Almond Twist}	0.028	1.000

Rules: 20k Data

Antecedent	Consequent	Support	Confidence
{Coffee Eclair,Single Espresso}	{Blackberry Tart}	0.026	0.926
{Apple Danish,Apple Tart}	{Apple Croissant}	0.026	0.925
{Apple Croissant,Apple Danish}	{Apple Tart}	0.026	0.909
{Apple Croissant,Apple Tart}	{Apple Danish}	0.026	0.908
{Vanilla Frappuccino,Walnut Cookie}	{Chocolate Tart}	0.028	0.916
{Chocolate Tart,Walnut Cookie}	{Vanilla Frappuccino}	0.028	0.908
{Lemon Lemonade,Raspberry Lemonade}	{Lemon Cookie}	0.025	0.957
{Lemon Cookie,Lemon Lemonade}	{Raspberry Lemonade}	0.025	0.917
{Lemon Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.025	0.904
{Lemon Lemonade,Raspberry Lemonade}	{Raspberry Cookie}	0.026	0.961
{Lemon Lemonade,Raspberry Cookie}	{Raspberry Lemonade}	0.026	0.916
{Raspberry Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.026	0.926
{Lemon Cookie,Lemon Lemonade}	{Raspberry Cookie}	0.026	0.921
{Lemon Lemonade,Raspberry Cookie}	{Lemon Cookie}	0.026	0.916

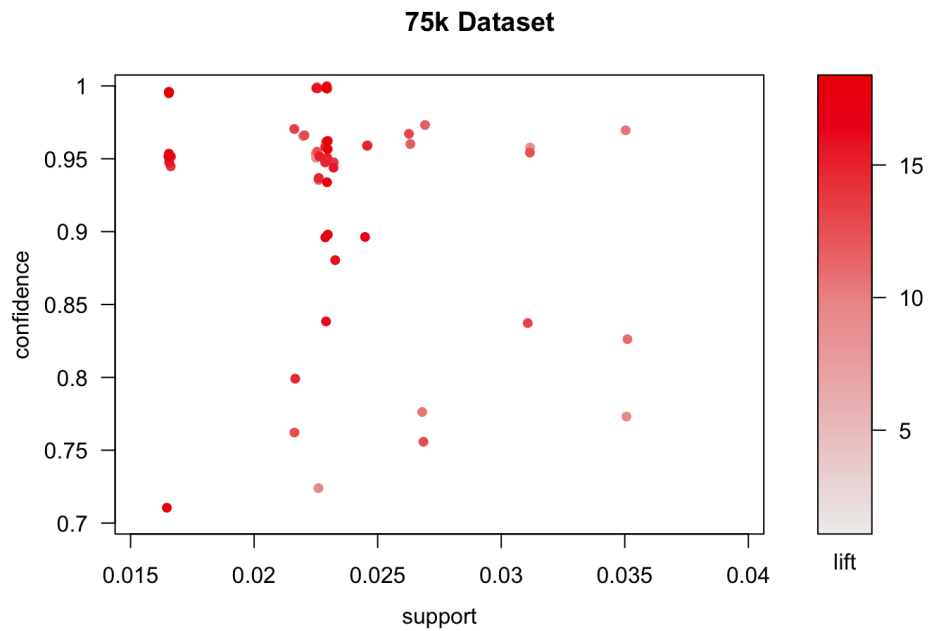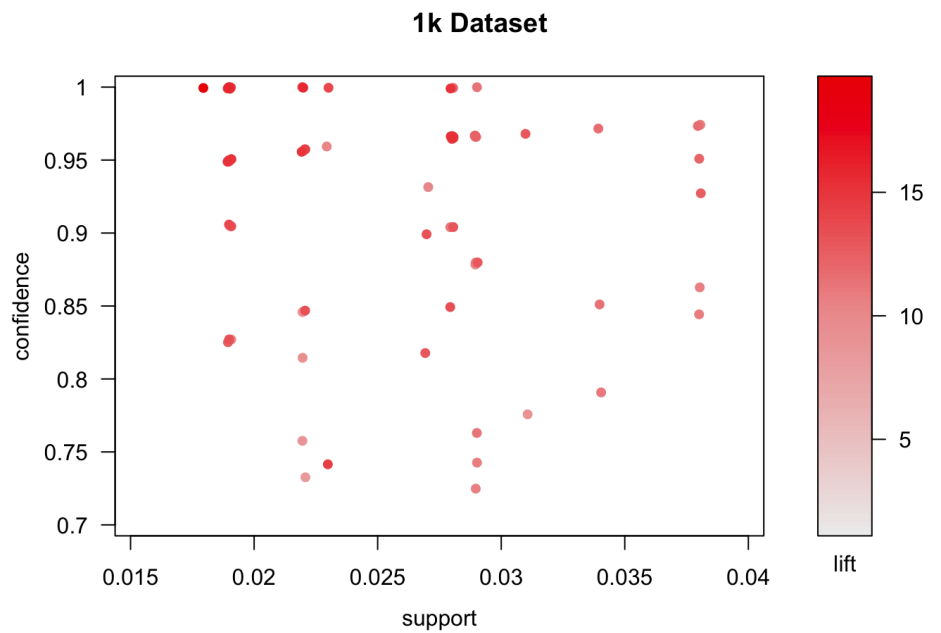| Antecedent	Consequent	Support	Confidence
{Casino Cake,Chocolate Coffee}	{Chocolate Cake}	0.033	0.954
{Casino Cake,Chocolate Cake}	{Chocolate Coffee}	0.033	0.933
{Lemon Cookie,Raspberry Lemonade}	{Raspberry Cookie}	0.026	0.906
{Raspberry Cookie,Raspberry Lemonade}	{Lemon Cookie}	0.026	0.924
{Almond Twist,Hot Coffee}	{Apple Pie}	0.028	0.925
{Apple Pie,Hot Coffee}	{Almond Twist}	0.028	0.929
{Almond Twist,Apple Pie}	{Coffee Eclair}	0.034	0.951
{Almond Twist,Coffee Eclair}	{Apple Pie}	0.034	0.943
{Apple Pie,Coffee Eclair}	{Almond Twist}	0.034	0.915
{Almond Twist,Hot Coffee}	{Coffee Eclair}	0.028	0.922
{Apple Pie,Hot Coffee}	{Coffee Eclair}	0.028	0.925
{Apricot Croissant,Hot Coffee}	{Blueberry Tart}	0.032	0.931
{Blueberry Tart,Hot Coffee}	{Apricot Croissant}	0.032	0.918
{Cherry Tart,Opera Cake}	{Apricot Danish}	0.041	0.937
{Apricot Danish,Opera Cake}	{Cherry Tart}	0.041	0.947
{Lemon Cookie,Lemon Lemonade,Raspberry Lemonade}	{Raspberry Cookie}	0.025	0.996
{Lemon Lemonade,Raspberry Cookie,Raspberry Lemonade}	{Lemon Cookie}	0.025	0.992
{Lemon Cookie,Lemon Lemonade,Raspberry Cookie}	{Raspberry Lemonade}	0.025	0.992
{Lemon Cookie,Raspberry Cookie,Raspberry Lemonade}	{Lemon Lemonade}	0.025	0.994
{Almond Twist,Apple Pie,Hot Coffee}	{Coffee Eclair}	0.028	0.996
{Almond Twist,Coffee Eclair,Hot Coffee}	{Apple Pie}	0.028	1.000
{Apple Pie,Coffee Eclair,Hot Coffee}	{Almond Twist}	0.028	1.000

Rules: 75k Data

Antecedent	Consequent	Support	Confidence
{Casino Cake,Chocolate Coffee}	{Chocolate Cake}	0.027	0.973
{Almond Twist,Apple Pie}	{Coffee Eclair}	0.031	0.959
{Almond Twist,Coffee Eclair}	{Apple Pie}	0.031	0.955
{Apricot Croissant,Hot Coffee}	{Blueberry Tart}	0.026	0.960
{Blueberry Tart,Hot Coffee}	{Apricot Croissant}	0.026	0.968
{Apricot Danish,Opera Cake}	{Cherry Tart}	0.035	0.969

Part 2.1-C

Trends in support and confidence are more pronounced in the largest dataset than in the three smaller datasets. Consider the plots below of the support and confidence for the 1k dataset and 75k dataset. Each plot shows support values between 0.015 and 0.7, and confidence values between 0.7 and 1. For the smaller dataset, the rules tend to be spread over a range of values, whereas for the larger dataset, the rules tend to be concentrated in a particular range. Specifically, if minsup is above about 0.022 and minconf is above about 0.9, the number of rules associated with the largest dataset will start to be consistently lower than the number of rules associated with smaller datasets, since these thresholds will begin to cut into the regions where the rules of the larger dataset are most concentrated. Therefore, differences in the number of rules per dataset size depends on the ranges of support and confidence that are

being considered. This accounts for the significant reduction in number of rules produced by the 75k data in the example above, where the minimum support and minimum confidence are 0.025 and 0.9, respectively.

1k Dataset

75k Dataset

Part 2.1-D-i

The most frequent itemset is: {Coffee Eclair}

Part 2.1-D-ii

The least frequent itemset is: {Lemon Lemonade,Raspberry Cookie}