

# Association rules

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## R Markdown

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When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
library(dplyr)

##
## Attaching package: 'dplyr'
##
## The following objects are masked from 'package:stats':
##
##   filter, lag
##
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union

library(ggplot2)
#install.packages('arules')
#install.packages('arulesViz')
library(arules)

## Loading required package: Matrix

##
## Attaching package: 'arules'
##
## The following object is masked from 'package:dplyr':
##
##   recode
##
## The following objects are masked from 'package:base':
##
##   abbreviate, write

library(arulesViz)

## Loading required package: grid

library(reshape2)
library(lubridate)

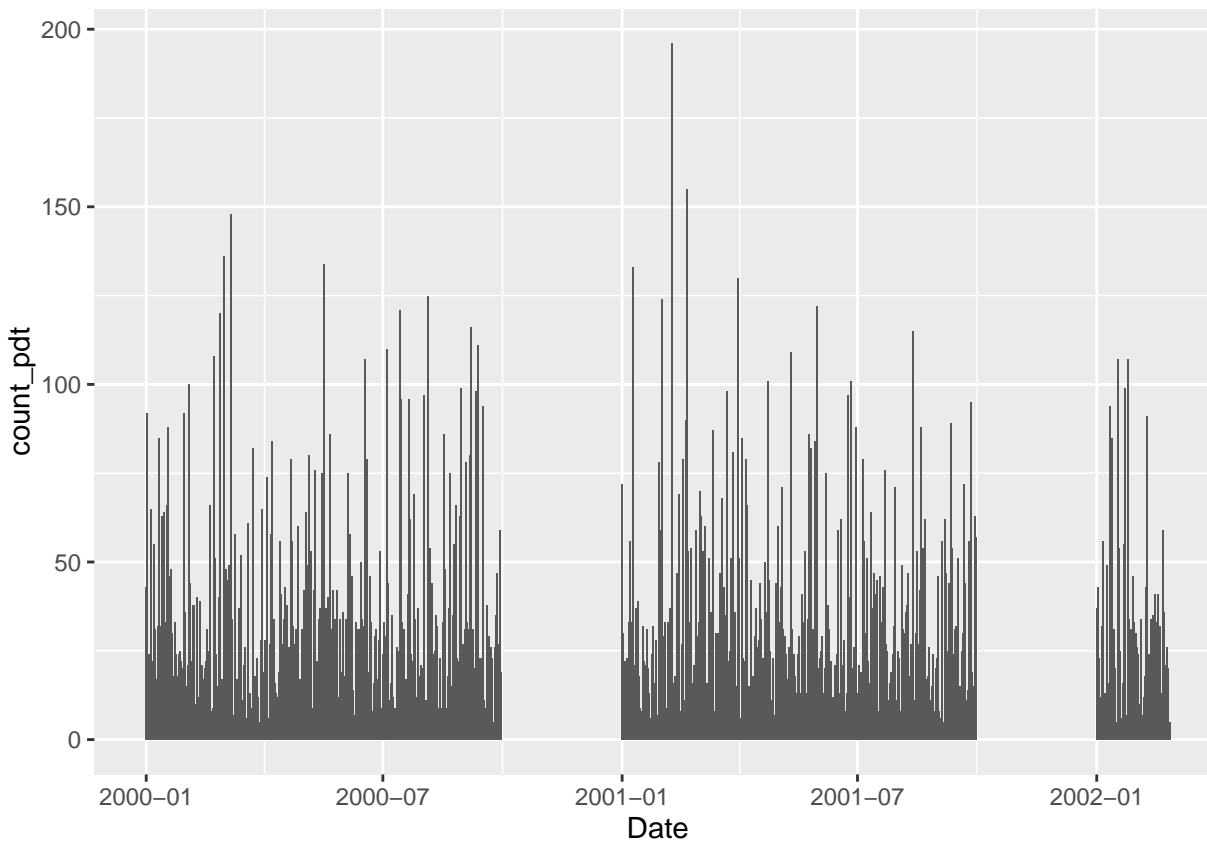
##
## Attaching package: 'lubridate'
##
## The following object is masked from 'package:base':
##
##   date
```

## Including Plots

```
##           Date           user_id           pdt           day
## Min.      :2000-01-01   Min.      : 1.0   vegetables: 1702   Friday    :3144
## 1st Qu.:2000-05-29   1st Qu.: 292.0   poultry    : 640   Monday    :2989
## Median :2001-01-30   Median : 582.0   soda      : 597   Saturday  :3431
## Mean    :2000-12-21   Mean    : 576.4   cereals   : 591   Sunday    :2955
## 3rd Qu.:2001-06-21   3rd Qu.: 863.0   ice cream : 579   Thursday  :3335
## Max.    :2002-02-26   Max.    :1139.0   cheeses   : 578   Tuesday   :3322
##                                     (Other)  :17656   Wednesday :3167
##           month
## Jan      :3504
## Feb      :3043
## May      :2520
## Mar      :2439
## Sep      :2296
## Aug      :2286
## (Other)  :6255

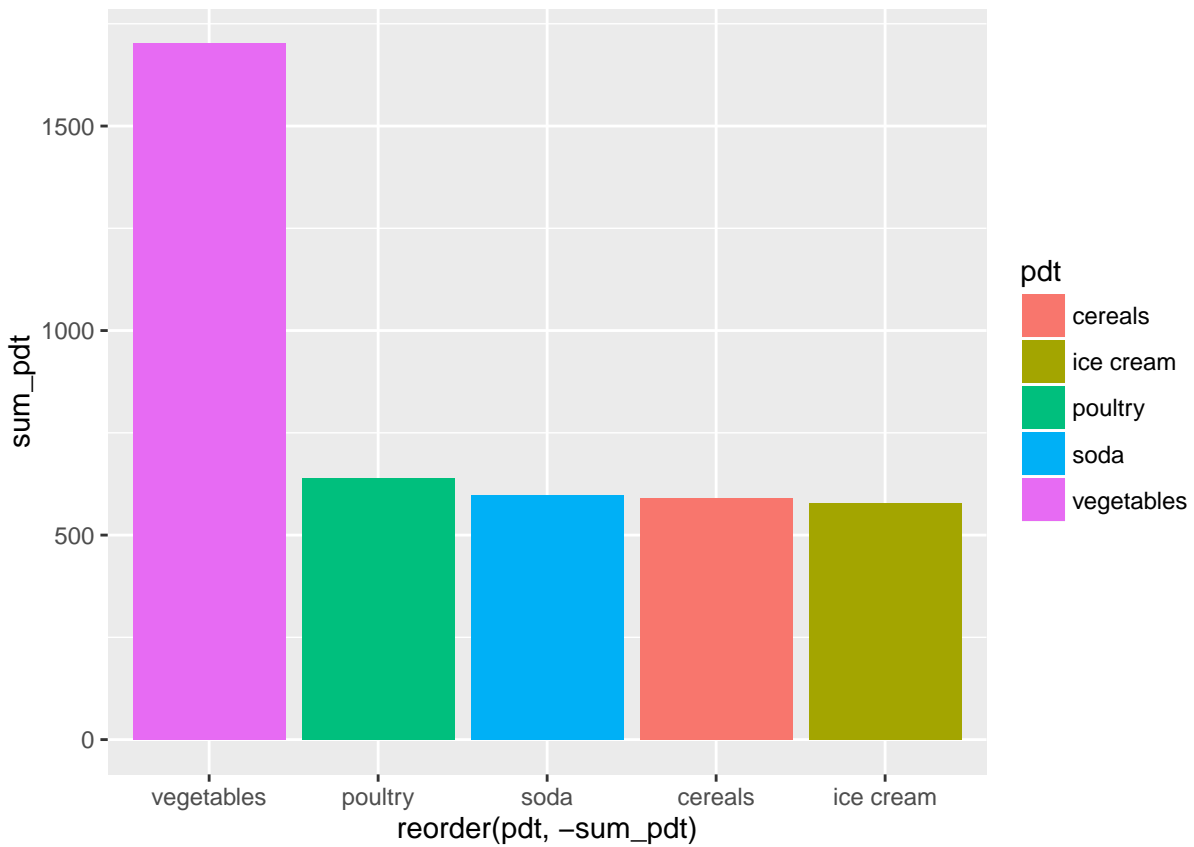
## 'data.frame': 22343 obs. of 5 variables:
## $ Date : Date, format: "2000-01-01" "2000-01-01" ...
## $ user_id: int 1 1 1 1 1 1 1 1 1 1 ...
## $ pdt : Factor w/ 38 levels "all- purpose",...: 38 25 27 20 1 12 31 5 36 4 ...
## $ day : Factor w/ 7 levels "Friday","Monday",...: 3 3 3 3 3 3 3 3 3 3 ...
## $ month : Ord.factor w/ 12 levels "Jan"<"Feb"<"Mar"<...: 1 1 1 1 1 1 1 1 1 1 ...

a <- basket %>%
  group_by(Date) %>%
  summarize(count_pdt = n(), cust_cnt = n_distinct(user_id))
ggplot(a) +
  geom_bar(aes(x = Date, y = count_pdt), stat = "identity")
```

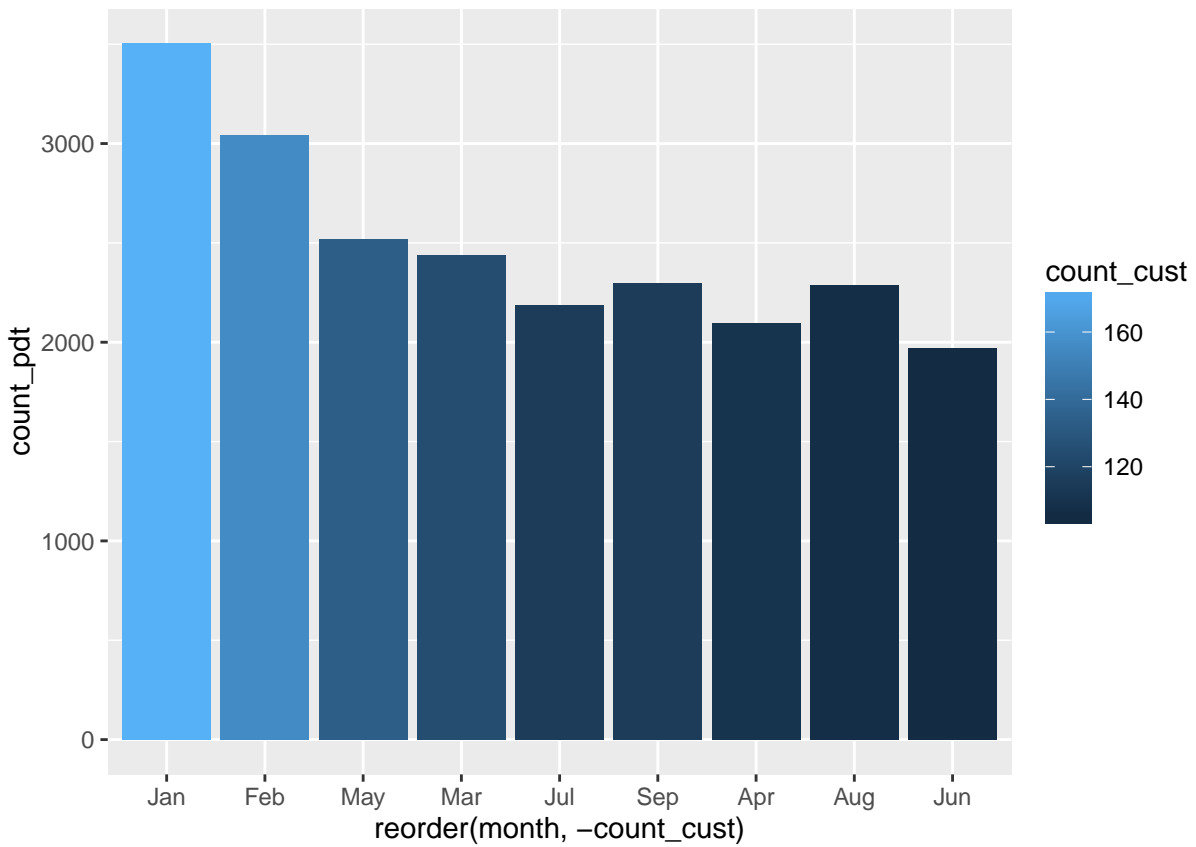


```
b <- basket %>%
  group_by(pdt) %>%
  summarize(sum_pdt = n()) %>%
  arrange(desc(sum_pdt))

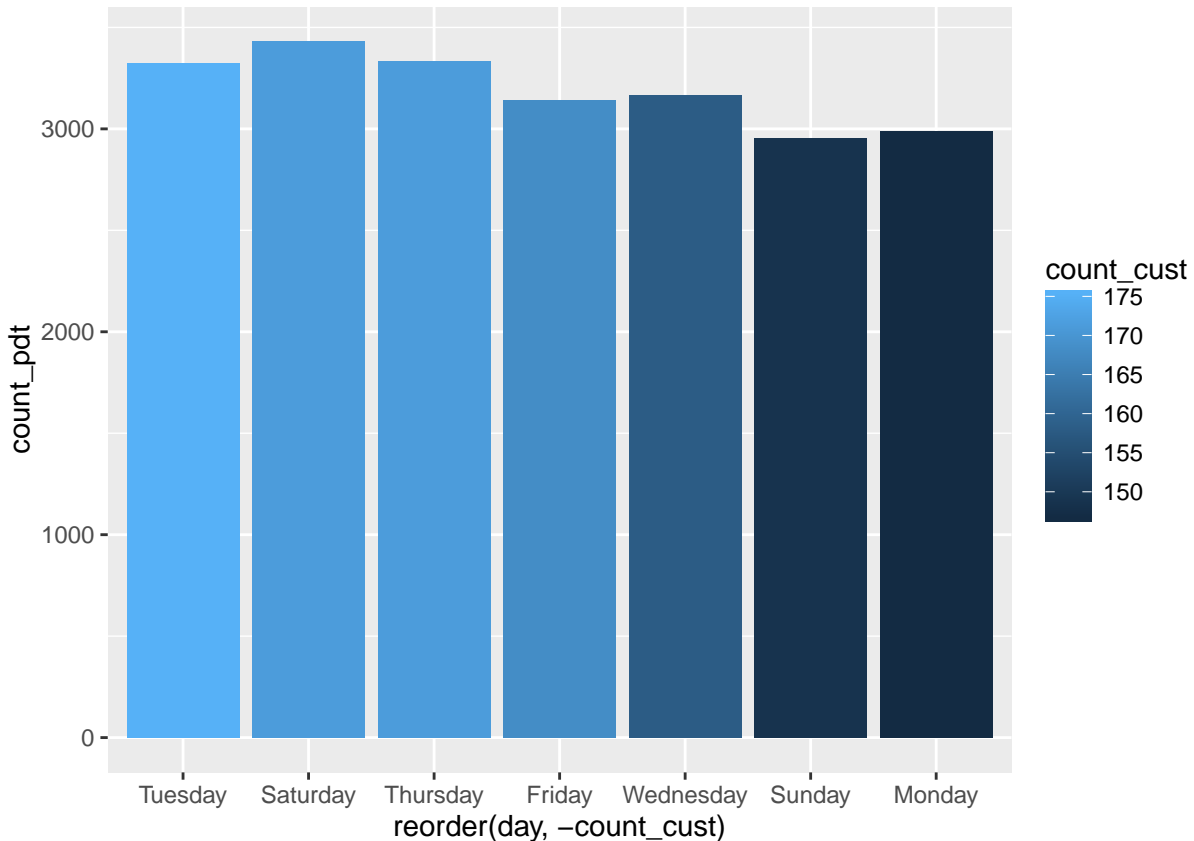
ggplot(b[1:5,]) +
  geom_bar(aes(x = reorder(pdt, -sum_pdt), y = sum_pdt, fill = pdt), stat = "identity")
```



```
c <- basket %>%
  group_by(month) %>%
  summarize(count_pdt = n(), count_cust = n_distinct(user_id))
ggplot(c) +
  geom_bar(aes(x = reorder(month, -count_cust), y = count_pdt, fill = count_cust), stat = "identity")
```



```
d <- basket %>%
  group_by(day) %>%
  summarise(count_pdt = n(), count_cust = n_distinct(user_id))
ggplot(d) +
  geom_bar(aes(x = reorder(day, -count_cust), y = count_pdt, fill = count_cust), stat = "identity")
```



```

basket1 <- dcast(basket, user_id ~ pdt)

## Using month as value column: use value.var to override.
## Aggregation function missing: defaulting to length
basket1 <- data.matrix(basket1)

basket_txn1 <- as(basket1[, -1], "itemMatrix")

## Warning in asMethod(object): matrix contains values other than 0 and 1!
## Setting all entries != 0 to 1.

rules1 <- apriori(basket_txn1, parameter = list(support = 0.1, confidence = 0.5))

## Apriori
##
## Parameter specification:
## confidence minval smax arem aval originalSupport maxtime support minlen
##           0.5    0.1    1 none FALSE             TRUE     5     0.1    1
## maxlen target   ext
##          10 rules FALSE
##
## Algorithmic control:
## filter tree heap memopt load sort verbose
##       0.1 TRUE TRUE  FALSE TRUE    2    TRUE
##
## Absolute minimum support count: 113

```

```
##
## set item appearances ...[0 item(s)] done [0.00s].
## set transactions ...[38 item(s), 1139 transaction(s)] done [0.00s].
## sorting and recoding items ... [38 item(s)] done [0.00s].
## creating transaction tree ... done [0.00s].
## checking subsets of size 1 2 3 done [0.00s].
## writing ... [716 rule(s)] done [0.00s].
## creating S4 object ... done [0.00s].
```

```
rules1 <- sort(rules1, by = "lift", decreasing = TRUE)
inspect(rules1)
```

	lhs	rhs	support	confidence	lift
## [1]	{soda,	=> {eggs}	0.1580334	0.5172414	1.326887
##	vegetables}				
## [2]	{dinner rolls,	=> {eggs}	0.1562774	0.5071225	1.300929
##	vegetables}				
## [3]	{pasta,	=> {eggs}	0.1439860	0.5030675	1.290527
##	vegetables}				
## [4]	{dishwashing liquid/detergent,	=> {eggs}	0.1536435	0.5014327	1.286333
##	vegetables}				
## [5]	{lunch meat,	=> {waffles}	0.1571554	0.5042254	1.279093
##	vegetables}				
## [6]	{individual meals,	=> {lunch meat}	0.1431080	0.5015385	1.269450
##	vegetables}				
## [7]	{mixes,	=> {poultry}	0.1562774	0.5281899	1.253351
##	vegetables}				
## [8]	{dinner rolls,	=> {poultry}	0.1615452	0.5242165	1.243922
##	vegetables}				
## [9]	{dishwashing liquid/detergent,	=> {poultry}	0.1597893	0.5214900	1.237452
##	vegetables}				
## [10]	{eggs,	=> {vegetables}	0.1211589	0.9019608	1.220111
##	sandwich loaves}				
## [11]	{eggs,	=> {vegetables}	0.1571554	0.8994975	1.216779
##	yogurt}				
## [12]	{dinner rolls,	=> {vegetables}	0.1562774	0.8989899	1.216092
##	eggs}				
## [13]	{dishwashing liquid/detergent,	=> {vegetables}	0.1536435	0.8974359	1.213990
##	eggs}				
## [14]	{sugar,	=> {poultry}	0.1518876	0.5103245	1.210957
##	vegetables}				
## [15]	{cereals,	=> {vegetables}	0.1510097	0.8911917	1.205543
##	laundry detergent}				
## [16]	{paper towels,	=> {vegetables}	0.1352063	0.8901734	1.204166
##	yogurt}				
## [17]	{lunch meat,	=> {poultry}	0.1580334	0.5070423	1.203169
##	vegetables}				
## [18]	{dishwashing liquid/detergent,	=> {vegetables}	0.1404741	0.8888889	1.202428
##	yogurt}				
## [19]	{cheeses,	=> {vegetables}	0.1501317	0.8860104	1.198534
##	eggs}				
## [20]	{sandwich loaves,	=> {vegetables}	0.1211589	0.8846154	1.196647
##	sugar}				
## [21]	{laundry detergent,	=> {vegetables}	0.1404741	0.8839779	1.195785
##	yogurt}				

## [22]	{eggs,	=> {vegetables}	0.1404741	0.8839779	1.195785
##	lunch meat}				
## [23]	{aluminum foil,	=> {vegetables}	0.1255487	0.8827160	1.194078
##	sugar}				
## [24]	{eggs,	=> {vegetables}	0.1553995	0.8805970	1.191211
##	poultry}				
## [25]	{eggs,	=> {vegetables}	0.1281826	0.8795181	1.189752
##	sandwich bags}				
## [26]	{all- purpose,	=> {vegetables}	0.1404741	0.8791209	1.189215
##	eggs}				
## [27]	{dinner rolls}	=> {poultry}	0.1949078	0.5011287	1.189137
## [28]	{dishwashing liquid/detergent,	=> {vegetables}	0.1334504	0.8786127	1.188527
##	sugar}				
## [29]	{aluminum foil,	=> {vegetables}	0.1378402	0.8770950	1.186474
##	eggs}				
## [30]	{sandwich loaves,	=> {poultry}	0.1413521	0.5000000	1.186458
##	vegetables}				
## [31]	{juice,	=> {vegetables}	0.1360843	0.8757062	1.184595
##	laundry detergent}				
## [32]	{lunch meat,	=> {vegetables}	0.1413521	0.8750000	1.183640
##	sugar}				
## [33]	{lunch meat,	=> {vegetables}	0.1413521	0.8750000	1.183640
##	yogurt}				
## [34]	{eggs,	=> {vegetables}	0.1343284	0.8742857	1.182674
##	individual meals}				
## [35]	{paper towels,	=> {vegetables}	0.1220369	0.8742138	1.182577
##	sandwich loaves}				
## [36]	{eggs,	=> {vegetables}	0.1457419	0.8736842	1.181860
##	soap}				
## [37]	{sandwich loaves,	=> {vegetables}	0.1334504	0.8735632	1.181697
##	yogurt}				
## [38]	{eggs,	=> {vegetables}	0.1325724	0.8728324	1.180708
##	fruits}				
## [39]	{eggs,	=> {vegetables}	0.1439860	0.8723404	1.180042
##	juice}				
## [40]	{eggs,	=> {vegetables}	0.1316945	0.8720930	1.179708
##	sugar}				
## [41]	{dinner rolls,	=> {vegetables}	0.1474978	0.8704663	1.177507
##	waffles}				
## [42]	{sandwich bags,	=> {vegetables}	0.1352063	0.8700565	1.176953
##	yogurt}				
## [43]	{aluminum foil,	=> {vegetables}	0.1466198	0.8697917	1.176595
##	bagels}				
## [44]	{milk,	=> {vegetables}	0.1220369	0.8687500	1.175186
##	sugar}				
## [45]	{laundry detergent,	=> {vegetables}	0.1334504	0.8685714	1.174944
##	shampoo}				
## [46]	{ketchup,	=> {vegetables}	0.1325724	0.8678161	1.173922
##	paper towels}				
## [47]	{coffee/tea,	=> {vegetables}	0.1264267	0.8674699	1.173454
##	sandwich loaves}				
## [48]	{ice cream,	=> {vegetables}	0.1378402	0.8674033	1.173364
##	laundry detergent}				
## [49]	{dinner rolls,				



##	laundry detergent}	=> {vegetables}	0.1431080	0.8670213	1.172847
## [50]	{flour,	=> {vegetables}	0.1246708	0.8658537	1.171268
##	sugar}				
## [51]	{poultry,	=> {vegetables}	0.1413521	0.8655914	1.170913
##	sandwich loaves}				
## [52]	{dinner rolls,	=> {vegetables}	0.1290606	0.8647059	1.169715
##	sandwich loaves}				
## [53]	{hand soap,	=> {vegetables}	0.1176471	0.8645161	1.169458
##	yogurt}				
## [54]	{cereals,	=> {vegetables}	0.1510097	0.8643216	1.169195
##	eggs}				
## [55]	{milk,	=> {vegetables}	0.1448639	0.8638743	1.168590
##	yogurt}				
## [56]	{bagels,	=> {vegetables}	0.1448639	0.8638743	1.168590
##	eggs}				
## [57]	{laundry detergent,	=> {vegetables}	0.1273047	0.8630952	1.167536
##	paper towels}				
## [58]	{eggs,	=> {vegetables}	0.1431080	0.8624339	1.166642
##	paper towels}				
## [59]	{aluminum foil,	=> {vegetables}	0.1369622	0.8618785	1.165890
##	shampoo}				
## [60]	{paper towels,	=> {vegetables}	0.1369622	0.8618785	1.165890
##	poultry}				
## [61]	{fruits,	=> {vegetables}	0.1202809	0.8616352	1.165561
##	sandwich loaves}				
## [62]	{aluminum foil,	=> {vegetables}	0.1527656	0.8613861	1.165224
##	yogurt}				
## [63]	{individual meals,	=> {vegetables}	0.1308165	0.8612717	1.165069
##	laundry detergent}				
## [64]	{spaghetti sauce,	=> {vegetables}	0.1246708	0.8606061	1.164169
##	sugar}				
## [65]	{laundry detergent,	=> {vegetables}	0.1404741	0.8602151	1.163640
##	sandwich bags}				
## [66]	{beef,	=> {vegetables}	0.1404741	0.8602151	1.163640
##	eggs}				
## [67]	{eggs,	=> {vegetables}	0.1404741	0.8602151	1.163640
##	laundry detergent}				
## [68]	{pork,	=> {vegetables}	0.1132572	0.8600000	1.163349
##	sugar}				
## [69]	{sandwich bags,	=> {vegetables}	0.1132572	0.8600000	1.163349
##	sugar}				
## [70]	{mixes,	=> {vegetables}	0.1562774	0.8599034	1.163218
##	poultry}				
## [71]	{individual meals,	=> {vegetables}	0.1237928	0.8597561	1.163019
##	sandwich bags}				
## [72]	{sandwich loaves,	=> {vegetables}	0.1290606	0.8596491	1.162875
##	shampoo}				
## [73]	{dinner rolls,	=> {vegetables}	0.1290606	0.8596491	1.162875
##	toilet paper}				
## [74]	{laundry detergent,	=> {vegetables}	0.1343284	0.8595506	1.162741
##	waffles}				
## [75]	{eggs,	=> {vegetables}	0.1448639	0.8593750	1.162504
##	milk}				
## [76]	{beef,				

##	yogurt}	=> {vegetables}	0.1387182	0.8586957	1.161585
## [77]	{aluminum foil,	=> {vegetables}	0.1387182	0.8586957	1.161585
##	soda}				
## [78]	{soda,	=> {vegetables}	0.1439860	0.8586387	1.161508
##	yogurt}				
## [79]	{cheeses,	=> {vegetables}	0.1378402	0.8579235	1.160540
##	laundry detergent}				
## [80]	{laundry detergent,	=> {vegetables}	0.1106234	0.8571429	1.159484
##	sandwich loaves}				
## [81]	{sandwich loaves,	=> {vegetables}	0.1211589	0.8571429	1.159484
##	soda}				
## [82]	{spaghetti sauce,	=> {vegetables}	0.1369622	0.8571429	1.159484
##	yogurt}				
## [83]	{dinner rolls,	=> {vegetables}	0.1466198	0.8564103	1.158493
##	soda}				
## [84]	{butter,	=> {vegetables}	0.1360843	0.8563536	1.158417
##	eggs}				
## [85]	{coffee/tea,	=> {vegetables}	0.1360843	0.8563536	1.158417
##	eggs}				
## [86]	{tortillas,	=> {vegetables}	0.1308165	0.8563218	1.158374
##	yogurt}				
## [87]	{ketchup,	=> {vegetables}	0.1308165	0.8563218	1.158374
##	yogurt}				
## [88]	{laundry detergent,	=> {vegetables}	0.1308165	0.8563218	1.158374
##	toilet paper}				
## [89]	{eggs,	=> {vegetables}	0.1448639	0.8549223	1.156480
##	waffles}				
## [90]	{dishwashing liquid/detergent,	=> {vegetables}	0.1597893	0.8544601	1.155855
##	poultry}				
## [91]	{hand soap,	=> {vegetables}	0.1185250	0.8544304	1.155815
##	sandwich loaves}				
## [92]	{laundry detergent,	=> {vegetables}	0.1492537	0.8542714	1.155600
##	poultry}				
## [93]	{dinner rolls,	=> {vegetables}	0.1387182	0.8540541	1.155306
##	lunch meat}				
## [94]	{aluminum foil,	=> {vegetables}	0.1281826	0.8538012	1.154964
##	sandwich loaves}				
## [95]	{shampoo,	=> {vegetables}	0.1281826	0.8538012	1.154964
##	soda}				
## [96]	{flour,	=> {vegetables}	0.1176471	0.8535032	1.154561
##	juice}				
## [97]	{mixes,	=> {vegetables}	0.1176471	0.8535032	1.154561
##	sugar}				
## [98]	{all- purpose,	=> {vegetables}	0.1431080	0.8534031	1.154425
##	yogurt}				
## [99]	{dishwashing liquid/detergent,	=> {vegetables}	0.1123793	0.8533333	1.154331
##	sandwich loaves}				
## [100]	{dinner rolls,	=> {vegetables}	0.1422300	0.8526316	1.153382
##	yogurt}				
## [101]	{soap,	=> {vegetables}	0.1369622	0.8524590	1.153148
##	spaghetti sauce}				
## [102]	{aluminum foil,	=> {vegetables}	0.1369622	0.8524590	1.153148
##	lunch meat}				
## [103]	{lunch meat,				

##	waffles}	=> {vegetables}	0.1571554	0.8523810	1.153043
## [104]	{fruits,	=> {vegetables}	0.1264267	0.8520710	1.152623
##	laundry detergent}				
## [105]	{sugar,	=> {vegetables}	0.1360843	0.8516484	1.152052
##	waffles}				
## [106]	{lunch meat,	=> {vegetables}	0.1360843	0.8516484	1.152052
##	soda}				
## [107]	{mixes,	=> {vegetables}	0.1255487	0.8511905	1.151432
##	sandwich loaves}				
## [108]	{butter,	=> {vegetables}	0.1255487	0.8511905	1.151432
##	juice}				
## [109]	{flour,	=> {vegetables}	0.1202809	0.8509317	1.151082
##	sandwich loaves}				
## [110]	{paper towels,	=> {vegetables}	0.1202809	0.8509317	1.151082
##	sugar}				
## [111]	{pasta,	=> {vegetables}	0.1352063	0.8508287	1.150943
##	yogurt}				
## [112]	{lunch meat,	=> {vegetables}	0.1246708	0.8502994	1.150227
##	sandwich loaves}				
## [113]	{sandwich loaves,	=> {vegetables}	0.1246708	0.8502994	1.150227
##	waffles}				
## [114]	{ice cream,	=> {vegetables}	0.1343284	0.8500000	1.149822
##	sandwich loaves}				
## [115]	{cheeses,	=> {vegetables}	0.1439860	0.8497409	1.149471
##	sandwich bags}				
## [116]	{eggs,	=> {vegetables}	0.1439860	0.8497409	1.149471
##	pasta}				
## [117]	{eggs,	=> {vegetables}	0.1387182	0.8494624	1.149095
##	spaghetti sauce}				
## [118]	{flour,	=> {vegetables}	0.1237928	0.8493976	1.149007
##	laundry detergent}				
## [119]	{lunch meat,	=> {vegetables}	0.1580334	0.8490566	1.148546
##	poultry}				
## [120]	{eggs,	=> {vegetables}	0.1281826	0.8488372	1.148249
##	pork}				
## [121]	{eggs,	=> {vegetables}	0.1281826	0.8488372	1.148249
##	shampoo}				
## [122]	{all- purpose,	=> {vegetables}	0.1325724	0.8483146	1.147542
##	paper towels}				
## [123]	{bagels,	=> {vegetables}	0.1422300	0.8481675	1.147343
##	dishwashing liquid/detergent}				
## [124]	{aluminum foil,	=> {vegetables}	0.1176471	0.8481013	1.147253
##	hand soap}				
## [125]	{poultry,	=> {vegetables}	0.1518876	0.8480392	1.147169
##	sugar}				
## [126]	{eggs,	=> {vegetables}	0.1220369	0.8475610	1.146523
##	hand soap}				
## [127]	{dinner rolls,	=> {vegetables}	0.1316945	0.8474576	1.146383
##	paper towels}				
## [128]	{bagels,	=> {vegetables}	0.1316945	0.8474576	1.146383
##	dinner rolls}				
## [129]	{aluminum foil,	=> {vegetables}	0.1457419	0.8469388	1.145681
##	mixes}				
## [130]	{hand soap,				

##	lunch meat}	=> {vegetables}	0.1211589	0.8466258	1.145257
## [131]	{paper towels,	=> {vegetables}	0.1308165	0.8465909	1.145210
##	soap}				
## [132]	{laundry detergent,	=> {vegetables}	0.1308165	0.8465909	1.145210
##	soap}				
## [133]	{eggs,	=> {vegetables}	0.1404741	0.8465608	1.145170
##	ketchup}				
## [134]	{pasta,	=> {vegetables}	0.1352063	0.8461538	1.144619
##	spaghetti sauce}				
## [135]	{poultry,	=> {vegetables}	0.1448639	0.8461538	1.144619
##	spaghetti sauce}				
## [136]	{laundry detergent,	=> {vegetables}	0.1299385	0.8457143	1.144024
##	pasta}				
## [137]	{pork,	=> {vegetables}	0.1202809	0.8456790	1.143977
##	spaghetti sauce}				
## [138]	{aluminum foil,	=> {vegetables}	0.1343284	0.8453039	1.143469
##	dishwashing liquid/detergent}				
## [139]	{aluminum foil,	=> {vegetables}	0.1246708	0.8452381	1.143380
##	butter}				
## [140]	{eggs,	=> {vegetables}	0.1580334	0.8450704	1.143153
##	soda}				
## [141]	{aluminum foil,	=> {vegetables}	0.1483758	0.8450000	1.143058
##	poultry}				
## [142]	{ketchup,	=> {vegetables}	0.1290606	0.8448276	1.142825
##	sandwich loaves}				
## [143]	{lunch meat,	=> {vegetables}	0.1290606	0.8448276	1.142825
##	sandwich bags}				
## [144]	{poultry,	=> {vegetables}	0.1527656	0.8446602	1.142599
##	yogurt}				
## [145]	{butter,	=> {vegetables}	0.1334504	0.8444444	1.142307
##	laundry detergent}				
## [146]	{individual meals,	=> {vegetables}	0.1334504	0.8444444	1.142307
##	yogurt}				
## [147]	{sugar,	=> {vegetables}	0.1281826	0.8439306	1.141612
##	toilet paper}				
## [148]	{laundry detergent,	=> {vegetables}	0.1185250	0.8437500	1.141367
##	pork}				
## [149]	{butter,	=> {vegetables}	0.1185250	0.8437500	1.141367
##	yogurt}				
## [150]	{flour,	=> {vegetables}	0.1325724	0.8435754	1.141131
##	yogurt}				
## [151]	{ice cream,	=> {vegetables}	0.1325724	0.8435754	1.141131
##	sugar}				
## [152]	{aluminum foil,	=> {vegetables}	0.1325724	0.8435754	1.141131
##	pasta}				
## [153]	{ketchup,	=> {vegetables}	0.1325724	0.8435754	1.141131
##	laundry detergent}				
## [154]	{dinner rolls,	=> {vegetables}	0.1325724	0.8435754	1.141131
##	juice}				
## [155]	{waffles,	=> {vegetables}	0.1466198	0.8434343	1.140940
##	yogurt}				
## [156]	{ice cream,	=> {vegetables}	0.1466198	0.8434343	1.140940
##	lunch meat}				
## [157]	{all- purpose,				

##	laundry detergent}	=> {vegetables}	0.1369622	0.8432432	1.140682
## [158]	{milk,	=> {vegetables}	0.1132572	0.8431373	1.140538
##	sandwich loaves}				
## [159]	{aluminum foil,	=> {vegetables}	0.1273047	0.8430233	1.140384
##	sandwich bags}				
## [160]	{shampoo,	=> {vegetables}	0.1176471	0.8427673	1.140038
##	spaghetti sauce}				
## [161]	{cereals,	=> {vegetables}	0.1316945	0.8426966	1.139942
##	sugar}				
## [162]	{cereals,	=> {vegetables}	0.1360843	0.8423913	1.139529
##	pasta}				
## [163]	{soap,	=> {vegetables}	0.1264267	0.8421053	1.139142
##	yogurt}				
## [164]	{beef,	=> {vegetables}	0.1308165	0.8418079	1.138740
##	sugar}				
## [165]	{hand soap,	=> {vegetables}	0.1167691	0.8417722	1.138692
##	individual meals}				
## [166]	{hand soap,	=> {vegetables}	0.1167691	0.8417722	1.138692
##	ketchup}				
## [167]	{flour,	=> {vegetables}	0.1167691	0.8417722	1.138692
##	paper towels}				
## [168]	{cheeses,	=> {vegetables}	0.1352063	0.8415301	1.138364
##	ketchup}				
## [169]	{cheeses,	=> {vegetables}	0.1352063	0.8415301	1.138364
##	lunch meat}				
## [170]	{aluminum foil,	=> {vegetables}	0.1395961	0.8412698	1.138012
##	dinner rolls}				
## [171]	{mixes,	=> {vegetables}	0.1255487	0.8411765	1.137886
##	toilet paper}				
## [172]	{hand soap,	=> {vegetables}	0.1158911	0.8407643	1.137328
##	sugar}				
## [173]	{cheeses,	=> {vegetables}	0.1343284	0.8406593	1.137186
##	pasta}				
## [174]	{laundry detergent,	=> {vegetables}	0.1343284	0.8406593	1.137186
##	mixes}				
## [175]	{ketchup,	=> {vegetables}	0.1202809	0.8404908	1.136958
##	lunch meat}				
## [176]	{dinner rolls,	=> {vegetables}	0.1387182	0.8404255	1.136870
##	dishwashing liquid/detergent}				
## [177]	{flour,	=> {vegetables}	0.1246708	0.8402367	1.136615
##	ketchup}				
## [178]	{sugar,	=> {vegetables}	0.1334504	0.8397790	1.135996
##	yogurt}				
## [179]	{juice,	=> {vegetables}	0.1334504	0.8397790	1.135996
##	paper towels}				
## [180]	{dinner rolls,	=> {vegetables}	0.1378402	0.8395722	1.135716
##	sugar}				
## [181]	{spaghetti sauce,	=> {vegetables}	0.1378402	0.8395722	1.135716
##	waffles}				
## [182]	{sugar,	=> {vegetables}	0.1237928	0.8392857	1.135328
##	tortillas}				
## [183]	{sandwich bags,	=> {vegetables}	0.1237928	0.8392857	1.135328
##	spaghetti sauce}				
## [184]	{dinner rolls,				

## sandwich bags}	=> {vegetables}	0.1281826	0.8390805	1.135051
## [185] {bagels,				
## laundry detergent}	=> {vegetables}	0.1281826	0.8390805	1.135051
## [186] {dishwashing liquid/detergent,				
## juice}	=> {vegetables}	0.1281826	0.8390805	1.135051
## [187] {sandwich loaves,				
## soap}	=> {vegetables}	0.1325724	0.8388889	1.134792
## [188] {cheeses,				
## shampoo}	=> {vegetables}	0.1325724	0.8388889	1.134792
## [189] {bagels,				
## lunch meat}	=> {vegetables}	0.1325724	0.8388889	1.134792
## [190] {dishwashing liquid/detergent,				
## laundry detergent}	=> {vegetables}	0.1369622	0.8387097	1.134549
## [191] {laundry detergent,				
## soda}	=> {vegetables}	0.1369622	0.8387097	1.134549
## [192] {eggs,				
## toilet paper}	=> {vegetables}	0.1369622	0.8387097	1.134549
## [193] {sandwich bags,				
## shampoo}	=> {vegetables}	0.1229148	0.8383234	1.134026
## [194] {eggs}	=> {vegetables}	0.3266023	0.8378378	1.133370
## [195] {soda,				
## sugar}	=> {vegetables}	0.1360843	0.8378378	1.133370
## [196] {bagels,				
## yogurt}	=> {vegetables}	0.1360843	0.8378378	1.133370
## [197] {hand soap,				
## soap}	=> {vegetables}	0.1132572	0.8376623	1.133132
## [198] {cheeses,				
## paper towels}	=> {vegetables}	0.1264267	0.8372093	1.132519
## [199] {ice cream,				
## yogurt}	=> {vegetables}	0.1308165	0.8370787	1.132343
## [200] {poultry,				
## waffles}	=> {vegetables}	0.1395961	0.8368421	1.132023
## [201] {aluminum foil,				
## juice}	=> {vegetables}	0.1439860	0.8367347	1.131877
## [202] {cheeses,				
## yogurt}	=> {vegetables}	0.1439860	0.8367347	1.131877
## [203] {flour,				
## mixes}	=> {vegetables}	0.1255487	0.8362573	1.131232
## [204] {paper towels,				
## sandwich bags}	=> {vegetables}	0.1255487	0.8362573	1.131232
## [205] {aluminum foil,				
## laundry detergent}	=> {vegetables}	0.1343284	0.8360656	1.130972
## [206] {cereals,				
## waffles}	=> {vegetables}	0.1343284	0.8360656	1.130972
## [207] {poultry,				
## toilet paper}	=> {vegetables}	0.1431080	0.8358974	1.130745
## [208] {lunch meat,				
## pork}	=> {vegetables}	0.1246708	0.8352941	1.129929
## [209] {eggs,				
## flour}	=> {vegetables}	0.1246708	0.8352941	1.129929
## [210] {laundry detergent,				
## sugar}	=> {vegetables}	0.1246708	0.8352941	1.129929
## [211] {aluminum foil,				
## flour}	=> {vegetables}	0.1290606	0.8352273	1.129838

## [212] {dinner rolls, ## flour}	=> {vegetables} 0.1290606 0.8352273 1.129838
## [213] {individual meals, ## sandwich loaves}	=> {vegetables} 0.1334504 0.8351648 1.129754
## [214] {aluminum foil, ## paper towels}	=> {vegetables} 0.1334504 0.8351648 1.129754
## [215] {mixes, ## yogurt}	=> {vegetables} 0.1378402 0.8351064 1.129675
## [216] {sandwich bags, ## sandwich loaves}	=> {vegetables} 0.1150132 0.8343949 1.128712
## [217] {cereals, ## ketchup}	=> {vegetables} 0.1237928 0.8343195 1.128610
## [218] {eggs, ## tortillas}	=> {vegetables} 0.1325724 0.8342541 1.128522
## [219] {cereals, ## shampoo}	=> {vegetables} 0.1325724 0.8342541 1.128522
## [220] {sandwich bags, ## waffles}	=> {vegetables} 0.1325724 0.8342541 1.128522
## [221] {eggs, ## mixes}	=> {vegetables} 0.1325724 0.8342541 1.128522
## [222] {pasta, ## soda}	=> {vegetables} 0.1413521 0.8341969 1.128444
## [223] {aluminum foil, ## waffles}	=> {vegetables} 0.1413521 0.8341969 1.128444
## [224] {all- purpose, ## sandwich loaves}	=> {vegetables} 0.1185250 0.8333333 1.127276
## [225] {flour, ## sandwich bags}	=> {vegetables} 0.1141352 0.8333333 1.127276
## [226] {cheeses, ## sugar}	=> {vegetables} 0.1273047 0.8333333 1.127276
## [227] {fruits, ## yogurt}	=> {vegetables} 0.1316945 0.8333333 1.127276
## [228] {beef, ## lunch meat}	=> {vegetables} 0.1316945 0.8333333 1.127276
## [229] {mixes, ## soap}	=> {vegetables} 0.1229148 0.8333333 1.127276
## [230] {cereals, ## lunch meat}	=> {vegetables} 0.1404741 0.8333333 1.127276
## [231] {poultry, ## soda}	=> {vegetables} 0.1439860 0.8324873 1.126132
## [232] {cheeses, ## waffles}	=> {vegetables} 0.1439860 0.8324873 1.126132
## [233] {all- purpose, ## aluminum foil}	=> {vegetables} 0.1308165 0.8324022 1.126017
## [234] {beef, ## waffles}	=> {vegetables} 0.1308165 0.8324022 1.126017
## [235] {pork, ## yogurt}	=> {vegetables} 0.1264267 0.8323699 1.125973
## [236] {dishwashing liquid/detergent, ## spaghetti sauce}	=> {vegetables} 0.1220369 0.8323353 1.125926
## [237] {butter, ## sandwich loaves}	=> {vegetables} 0.1176471 0.8322981 1.125876
## [238] {dinner rolls, ## spaghetti sauce}	=> {vegetables} 0.1431080 0.8316327 1.124976

## [239] {bagels,	=> {vegetables}	0.1387182	0.8315789	1.124903
## spaghetti sauce}				
## [240] {pasta,	=> {vegetables}	0.1343284	0.8315217	1.124826
## poultry}				
## [241] {laundry detergent,	=> {vegetables}	0.1343284	0.8315217	1.124826
## spaghetti sauce}				
## [242] {juice,	=> {vegetables}	0.1343284	0.8315217	1.124826
## lunch meat}				
## [243] {individual meals,	=> {vegetables}	0.1299385	0.8314607	1.124743
## waffles}				
## [244] {coffee/tea,	=> {vegetables}	0.1299385	0.8314607	1.124743
## juice}				
## [245] {aluminum foil,	=> {vegetables}	0.1299385	0.8314607	1.124743
## spaghetti sauce}				
## [246] {bagels,	=> {vegetables}	0.1255487	0.8313953	1.124655
## sugar}				
## [247] {dishwashing liquid/detergent,	=> {vegetables}	0.1211589	0.8313253	1.124560
## shampoo}				
## [248] {bagels,	=> {vegetables}	0.1211589	0.8313253	1.124560
## soap}				
## [249] {yogurt}	=> {vegetables}	0.3195786	0.8310502	1.124188
## [250] {juice,	=> {vegetables}	0.1466198	0.8308458	1.123911
## yogurt}				
## [251] {juice,	=> {vegetables}	0.1466198	0.8308458	1.123911
## poultry}				
## [252] {poultry,	=> {vegetables}	0.1422300	0.8307692	1.123808
## shampoo}				
## [253] {lunch meat,	=> {vegetables}	0.1378402	0.8306878	1.123698
## soap}				
## [254] {paper towels,	=> {vegetables}	0.1334504	0.8306011	1.123580
## soda}				
## [255] {juice,	=> {vegetables}	0.1334504	0.8306011	1.123580
## ketchup}				
## [256] {juice,	=> {vegetables}	0.1202809	0.8303030	1.123177
## sandwich loaves}				
## [257] {butter,	=> {vegetables}	0.1158911	0.8301887	1.123022
## milk}				
## [258] {lunch meat,	=> {vegetables}	0.1325724	0.8296703	1.122321
## shampoo}				
## [259] {aluminum foil,	=> {vegetables}	0.1325724	0.8296703	1.122321
## beef}				
## [260] {bagels,	=> {vegetables}	0.1325724	0.8296703	1.122321
## waffles}				
## [261] {aluminum foil,	=> {vegetables}	0.1404741	0.8290155	1.121436
## cheeses}				
## [262] {dinner rolls,	=> {vegetables}	0.1615452	0.8288288	1.121183
## poultry}				
## [263] {shampoo,	=> {vegetables}	0.1316945	0.8287293	1.121048
## yogurt}				
## [264] {dishwashing liquid/detergent,	=> {vegetables}	0.1316945	0.8287293	1.121048
## paper towels}				
## [265] {butter,	=> {vegetables}	0.1273047	0.8285714	1.120835
## sandwich bags}				
## [266] {coffee/tea,				



##	paper towels}	=> {vegetables}	0.1273047	0.8285714	1.120835
## [267]	{ice cream,	=> {vegetables}	0.1483758	0.8284314	1.120645
##	poultry}				
## [268]	{hand soap,	=> {vegetables}	0.1229148	0.8284024	1.120606
##	pasta}				
## [269]	{individual meals,	=> {vegetables}	0.1229148	0.8284024	1.120606
##	sugar}				
## [270]	{fruits,	=> {vegetables}	0.1229148	0.8284024	1.120606
##	soap}				
## [271]	{hand soap,	=> {vegetables}	0.1185250	0.8282209	1.120361
##	waffles}				
## [272]	{milk,	=> {vegetables}	0.1185250	0.8282209	1.120361
##	waffles}				
## [273]	{dishwashing liquid/detergent,	=> {vegetables}	0.1264267	0.8275862	1.119502
##	toilet paper}				
## [274]	{shampoo,	=> {vegetables}	0.1220369	0.8273810	1.119224
##	sugar}				
## [275]	{beef,	=> {vegetables}	0.1220369	0.8273810	1.119224
##	individual meals}				
## [276]	{soda,	=> {vegetables}	0.1387182	0.8272251	1.119014
##	spaghetti sauce}				
## [277]	{dinner rolls,	=> {vegetables}	0.1343284	0.8270270	1.118746
##	mixes}				
## [278]	{laundry detergent,	=> {vegetables}	0.1299385	0.8268156	1.118460
##	lunch meat}				
## [279]	{bagels,	=> {vegetables}	0.1088674	0.8266667	1.118258
##	hand soap}				
## [280]	{dishwashing liquid/detergent,	=> {vegetables}	0.1255487	0.8265896	1.118154
##	tortillas}				
## [281]	{cereals,	=> {vegetables}	0.1422300	0.8265306	1.118074
##	yogurt}				
## [282]	{eggs,	=> {vegetables}	0.1378402	0.8263158	1.117783
##	ice cream}				
## [283]	{butter,	=> {vegetables}	0.1167691	0.8260870	1.117474
##	fruits}				
## [284]	{aluminum foil,	=> {vegetables}	0.1457419	0.8258706	1.117181
##	ice cream}				
## [285]	{ice cream,	=> {vegetables}	0.1290606	0.8258427	1.117144
##	sandwich bags}				
## [286]	{paper towels,	=> {vegetables}	0.1290606	0.8258427	1.117144
##	waffles}				
## [287]	{ketchup,	=> {vegetables}	0.1290606	0.8258427	1.117144
##	toilet paper}				
## [288]	{butter,	=> {vegetables}	0.1123793	0.8258065	1.117094
##	flour}				
## [289]	{cereals,	=> {vegetables}	0.1413521	0.8256410	1.116871
##	dinner rolls}				
## [290]	{shampoo,	=> {vegetables}	0.1246708	0.8255814	1.116790
##	soap}				
## [291]	{coffee/tea,	=> {vegetables}	0.1325724	0.8251366	1.116188
##	yogurt}				
## [292]	{cheeses,	=> {vegetables}	0.1281826	0.8248588	1.115812
##	sandwich loaves}				
## [293]	{sugar}	=> {vegetables}	0.2976295	0.8248175	1.115757

## [294] {aluminum foil, ## toilet paper}	=> {vegetables} 0.1316945 0.8241758 1.114889
## [295] {coffee/tea, ## poultry}	=> {vegetables} 0.1439860 0.8241206 1.114814
## [296] {soap, ## sugar}	=> {vegetables} 0.1273047 0.8238636 1.114466
## [297] {bagels, ## sandwich bags}	=> {vegetables} 0.1273047 0.8238636 1.114466
## [298] {mixes, ## waffles}	=> {vegetables} 0.1273047 0.8238636 1.114466
## [299] {ketchup, ## sandwich bags}	=> {vegetables} 0.1352063 0.8235294 1.114014
## [300] {all- purpose, ## soda}	=> {vegetables} 0.1229148 0.8235294 1.114014
## [301] {cereals, ## paper towels}	=> {vegetables} 0.1352063 0.8235294 1.114014
## [302] {juice, ## pasta}	=> {vegetables} 0.1229148 0.8235294 1.114014
## [303] {ketchup, ## soap}	=> {vegetables} 0.1352063 0.8235294 1.114014
## [304] {dishwashing liquid/detergent, ## lunch meat}	=> {vegetables} 0.1431080 0.8232323 1.113612
## [305] {aluminum foil, ## coffee/tea}	=> {vegetables} 0.1308165 0.8232044 1.113575
## [306] {lunch meat, ## spaghetti sauce}	=> {vegetables} 0.1387182 0.8229167 1.113185
## [307] {cheeses, ## soda}	=> {vegetables} 0.1387182 0.8229167 1.113185
## [308] {dinner rolls, ## hand soap}	=> {vegetables} 0.1264267 0.8228571 1.113105
## [309] {dishwashing liquid/detergent, ## sandwich bags}	=> {vegetables} 0.1264267 0.8228571 1.113105
## [310] {bagels, ## paper towels}	=> {vegetables} 0.1264267 0.8228571 1.113105
## [311] {milk, ## poultry}	=> {vegetables} 0.1466198 0.8226601 1.112838
## [312] {flour, ## soda}	=> {vegetables} 0.1299385 0.8222222 1.112246
## [313] {aluminum foil, ## fruits}	=> {vegetables} 0.1299385 0.8222222 1.112246
## [314] {aluminum foil, ## ketchup}	=> {vegetables} 0.1299385 0.8222222 1.112246
## [315] {butter, ## ketchup}	=> {vegetables} 0.1176471 0.8220859 1.112062
## [316] {butter, ## coffee/tea}	=> {vegetables} 0.1176471 0.8220859 1.112062
## [317] {juice, ## sugar}	=> {vegetables} 0.1176471 0.8220859 1.112062
## [318] {dishwashing liquid/detergent, ## fruits}	=> {vegetables} 0.1378402 0.8219895 1.111931
## [319] {bagels, ## poultry}	=> {vegetables} 0.1378402 0.8219895 1.111931
## [320] {butter, ## mixes}	=> {vegetables} 0.1255487 0.8218391 1.111728

## [321] {flour,				
## fruits}	=> {vegetables}	0.1132572	0.8216561	1.111480
## [322] {butter,				
## sugar}	=> {vegetables}	0.1132572	0.8216561	1.111480
## [323] {bagels,				
## juice}	=> {vegetables}	0.1334504	0.8216216	1.111434
## [324] {cheeses,				
## soap}	=> {vegetables}	0.1334504	0.8216216	1.111434
## [325] {juice,				
## spaghetti sauce}	=> {vegetables}	0.1413521	0.8214286	1.111172
## [326] {flour,				
## poultry}	=> {vegetables}	0.1290606	0.8212291	1.110902
## [327] {beef,				
## dishwashing liquid/detergent}	=> {vegetables}	0.1290606	0.8212291	1.110902
## [328] {bagels,				
## soda}	=> {vegetables}	0.1290606	0.8212291	1.110902
## [329] {cereals,				
## spaghetti sauce}	=> {vegetables}	0.1369622	0.8210526	1.110664
## [330] {juice,				
## waffles}	=> {vegetables}	0.1369622	0.8210526	1.110664
## [331] {sandwich loaves,				
## tortillas}	=> {vegetables}	0.1167691	0.8209877	1.110576
## [332] {coffee/tea,				
## sugar}	=> {vegetables}	0.1167691	0.8209877	1.110576
## [333] {lunch meat,				
## pasta}	=> {vegetables}	0.1167691	0.8209877	1.110576
## [334] {butter,				
## dinner rolls}	=> {vegetables}	0.1246708	0.8208092	1.110335
## [335] {beef,				
## ice cream}	=> {vegetables}	0.1325724	0.8206522	1.110122
## [336] {ketchup,				
## waffles}	=> {vegetables}	0.1325724	0.8206522	1.110122
## [337] {cereals,				
## poultry}	=> {vegetables}	0.1483758	0.8203883	1.109765
## [338] {cereals,				
## flour}	=> {vegetables}	0.1202809	0.8203593	1.109726
## [339] {individual meals,				
## pasta}	=> {vegetables}	0.1202809	0.8203593	1.109726
## [340] {paper towels,				
## spaghetti sauce}	=> {vegetables}	0.1281826	0.8202247	1.109544
## [341] {juice,				
## soap}	=> {vegetables}	0.1281826	0.8202247	1.109544
## [342] {dinner rolls,				
## milk}	=> {vegetables}	0.1281826	0.8202247	1.109544
## [343] {dinner rolls,				
## soap}	=> {vegetables}	0.1281826	0.8202247	1.109544
## [344] {laundry detergent,				
## milk}	=> {vegetables}	0.1360843	0.8201058	1.109383
## [345] {dishwashing liquid/detergent,				
## waffles}	=> {vegetables}	0.1439860	0.8200000	1.109240
## [346] {pasta,				
## sandwich loaves}	=> {vegetables}	0.1158911	0.8198758	1.109072
## [347] {pasta,				
## sugar}	=> {vegetables}	0.1237928	0.8197674	1.108925

## [348] {cheeses,			
## individual meals}	=> {vegetables}	0.1316945	0.8196721 1.108796
## [349] {aluminum foil,			
## milk}	=> {vegetables}	0.1316945	0.8196721 1.108796
## [350] {lunch meat,			
## milk}	=> {vegetables}	0.1316945	0.8196721 1.108796
## [351] {all- purpose,			
## sugar}	=> {vegetables}	0.1194030	0.8192771 1.108262
## [352] {coffee/tea,			
## laundry detergent}	=> {vegetables}	0.1194030	0.8192771 1.108262
## [353] {paper towels,			
## shampoo}	=> {vegetables}	0.1273047	0.8192090 1.108170
## [354] {shampoo,			
## waffles}	=> {vegetables}	0.1273047	0.8192090 1.108170
## [355] {beef,			
## ketchup}	=> {vegetables}	0.1273047	0.8192090 1.108170
## [356] {lunch meat,			
## paper towels}	=> {vegetables}	0.1352063	0.8191489 1.108089
## [357] {sandwich loaves,			
## spaghetti sauce}	=> {vegetables}	0.1229148	0.8187135 1.107500
## [358] {butter,			
## spaghetti sauce}	=> {vegetables}	0.1229148	0.8187135 1.107500
## [359] {fruits,			
## paper towels}	=> {vegetables}	0.1229148	0.8187135 1.107500
## [360] {individual meals,			
## soap}	=> {vegetables}	0.1308165	0.8186813 1.107456
## [361] {beef,			
## soap}	=> {vegetables}	0.1308165	0.8186813 1.107456
## [362] {cereals,			
## dishwashing liquid/detergent}	=> {vegetables}	0.1387182	0.8186528 1.107418
## [363] {bagels,			
## sandwich loaves}	=> {vegetables}	0.1185250	0.8181818 1.106780
## [364] {sandwich bags,			
## soap}	=> {vegetables}	0.1299385	0.8176796 1.106101
## [365] {milk,			
## shampoo}	=> {vegetables}	0.1220369	0.8176471 1.106057
## [366] {dinner rolls,			
## individual meals}	=> {vegetables}	0.1220369	0.8176471 1.106057
## [367] {dinner rolls,			
## pasta}	=> {vegetables}	0.1413521	0.8172589 1.105532
## [368] {cheeses,			
## mixes}	=> {vegetables}	0.1334504	0.8172043 1.105458
## [369] {juice,			
## milk}	=> {vegetables}	0.1255487	0.8171429 1.105375
## [370] {cheeses,			
## dinner rolls}	=> {vegetables}	0.1369622	0.8167539 1.104849
## [371] {laundry detergent}	=> {vegetables}	0.3090430	0.8167053 1.104783
## [372] {flour,			
## pasta}	=> {vegetables}	0.1211589	0.8165680 1.104597
## [373] {ketchup,			
## sugar}	=> {vegetables}	0.1132572	0.8164557 1.104445
## [374] {dishwashing liquid/detergent,			
## pork}	=> {vegetables}	0.1246708	0.8160920 1.103953
## [375] {flour,			

##	shampoo}	=> {vegetables}	0.1167691	0.8159509	1.103763
## [376]	{juice,	=> {vegetables}	0.1167691	0.8159509	1.103763
##	tortillas}				
## [377]	{coffee/tea,	=> {vegetables}	0.1360843	0.8157895	1.103544
##	lunch meat}				
## [378]	{all- purpose,	=> {vegetables}	0.1281826	0.8156425	1.103345
##	ice cream}				
## [379]	{fruits,	=> {vegetables}	0.1202809	0.8154762	1.103120
##	ketchup}				
## [380]	{juice,	=> {vegetables}	0.1202809	0.8154762	1.103120
##	mixes}				
## [381]	{hand soap,	=> {vegetables}	0.1123793	0.8152866	1.102864
##	shampoo}				
## [382]	{hand soap,	=> {vegetables}	0.1123793	0.8152866	1.102864
##	juice}				
## [383]	{paper towels,	=> {vegetables}	0.1316945	0.8152174	1.102770
##	toilet paper}				
## [384]	{bagels,	=> {vegetables}	0.1237928	0.8150289	1.102515
##	pasta}				
## [385]	{beef,	=> {vegetables}	0.1158911	0.8148148	1.102226
##	sandwich loaves}				
## [386]	{flour,	=> {vegetables}	0.1273047	0.8146067	1.101944
##	lunch meat}				
## [387]	{ketchup,	=> {vegetables}	0.1273047	0.8146067	1.101944
##	milk}				
## [388]	{individual meals,	=> {vegetables}	0.1387182	0.8144330	1.101709
##	poultry}				
## [389]	{fruits,	=> {vegetables}	0.1194030	0.8143713	1.101626
##	milk}				
## [390]	{all- purpose,	=> {vegetables}	0.1229148	0.8139535	1.101061
##	cereals}				
## [391]	{bagels,	=> {vegetables}	0.1343284	0.8138298	1.100893
##	individual meals}				
## [392]	{ketchup,	=> {vegetables}	0.1343284	0.8138298	1.100893
##	mixes}				
## [393]	{cheeses,	=> {vegetables}	0.1343284	0.8138298	1.100893
##	spaghetti sauce}				
## [394]	{mixes,	=> {vegetables}	0.1264267	0.8135593	1.100527
##	sandwich bags}				
## [395]	{all- purpose,	=> {vegetables}	0.1264267	0.8135593	1.100527
##	dinner rolls}				
## [396]	{beef,	=> {vegetables}	0.1264267	0.8135593	1.100527
##	juice}				
## [397]	{beef,	=> {vegetables}	0.1264267	0.8135593	1.100527
##	soda}				
## [398]	{dishwashing liquid/detergent,	=> {vegetables}	0.1264267	0.8135593	1.100527
##	ketchup}				
## [399]	{laundry detergent,	=> {vegetables}	0.1185250	0.8132530	1.100113
##	tortillas}				
## [400]	{aluminum foil,	=> {vegetables}	0.1185250	0.8132530	1.100113
##	tortillas}				
## [401]	{beef,	=> {vegetables}	0.1299385	0.8131868	1.100023
##	cheeses}				
## [402]	{dishwashing liquid/detergent,				

##	soap}	=> {vegetables}	0.1299385	0.8131868	1.100023
## [403]	{cereals,	=> {vegetables}	0.1413521	0.8131313	1.099948
##	mixes}				
## [404]	{bagels,	=> {vegetables}	0.1106234	0.8129032	1.099640
##	flour}				
## [405]	{butter,	=> {vegetables}	0.1220369	0.8128655	1.099589
##	cereals}				
## [406]	{ice cream,	=> {vegetables}	0.1220369	0.8128655	1.099589
##	shampoo}				
## [407]	{all- purpose,	=> {vegetables}	0.1220369	0.8128655	1.099589
##	bagels}				
## [408]	{cheeses,	=> {vegetables}	0.1220369	0.8128655	1.099589
##	juice}				
## [409]	{coffee/tea,	=> {vegetables}	0.1334504	0.8128342	1.099547
##	ketchup}				
## [410]	{soap,	=> {vegetables}	0.1404741	0.8121827	1.098665
##	waffles}				
## [411]	{coffee/tea,	=> {vegetables}	0.1176471	0.8121212	1.098582
##	spaghetti sauce}				
## [412]	{fruits,	=> {vegetables}	0.1325724	0.8118280	1.098185
##	lunch meat}				
## [413]	{cheeses,	=> {vegetables}	0.1325724	0.8118280	1.098185
##	fruits}				
## [414]	{bagels,	=> {vegetables}	0.1325724	0.8118280	1.098185
##	toilet paper}				
## [415]	{cheeses,	=> {vegetables}	0.1325724	0.8118280	1.098185
##	dishwashing liquid/detergent}				
## [416]	{cereals,	=> {vegetables}	0.1211589	0.8117647	1.098100
##	sandwich loaves}				
## [417]	{tortillas,	=> {vegetables}	0.1211589	0.8117647	1.098100
##	waffles}				
## [418]	{all- purpose,	=> {vegetables}	0.1211589	0.8117647	1.098100
##	spaghetti sauce}				
## [419]	{beef,	=> {vegetables}	0.1246708	0.8114286	1.097645
##	shampoo}				
## [420]	{beef,	=> {vegetables}	0.1281826	0.8111111	1.097216
##	spaghetti sauce}				
## [421]	{dinner rolls,	=> {vegetables}	0.1281826	0.8111111	1.097216
##	ketchup}				
## [422]	{mixes,	=> {vegetables}	0.1281826	0.8111111	1.097216
##	spaghetti sauce}				
## [423]	{fruits,	=> {vegetables}	0.1167691	0.8109756	1.097032
##	pasta}				
## [424]	{all- purpose,	=> {vegetables}	0.1202809	0.8106509	1.096593
##	cheeses}				
## [425]	{coffee/tea,	=> {vegetables}	0.1237928	0.8103448	1.096179
##	shampoo}				
## [426]	{hand soap,	=> {vegetables}	0.1123793	0.8101266	1.095884
##	toilet paper}				
## [427]	{hand soap,	=> {vegetables}	0.1158911	0.8098160	1.095464
##	laundry detergent}				
## [428]	{milk,	=> {vegetables}	0.1308165	0.8097826	1.095419
##	paper towels}				
## [429]	{dinner rolls,				

##	ice cream}	=> {vegetables}	0.1308165	0.8097826	1.095419
## [430]	{cereals,	=> {vegetables}	0.1343284	0.8095238	1.095068
##	toilet paper}				
## [431]	{juice,	=> {vegetables}	0.1378402	0.8092784	1.094736
##	shampoo}				
## [432]	{ice cream,	=> {vegetables}	0.1378402	0.8092784	1.094736
##	paper towels}				
## [433]	{dishwashing liquid/detergent,	=> {vegetables}	0.1378402	0.8092784	1.094736
##	milk}				
## [434]	{butter,	=> {vegetables}	0.1229148	0.8092486	1.094696
##	waffles}				
## [435]	{individual meals,	=> {vegetables}	0.1229148	0.8092486	1.094696
##	shampoo}				
## [436]	{all- purpose,	=> {vegetables}	0.1229148	0.8092486	1.094696
##	milk}				
## [437]	{hand soap,	=> {vegetables}	0.1079895	0.8092105	1.094645
##	paper towels}				
## [438]	{sandwich loaves}	=> {vegetables}	0.2827041	0.8090452	1.094421
## [439]	{soap,				
##	soda}	=> {vegetables}	0.1413521	0.8090452	1.094421
## [440]	{mixes,	=> {vegetables}	0.1264267	0.8089888	1.094345
##	shampoo}				
## [441]	{ice cream,	=> {vegetables}	0.1264267	0.8089888	1.094345
##	ketchup}				
## [442]	{cheeses,	=> {vegetables}	0.1448639	0.8088235	1.094121
##	ice cream}				
## [443]	{sandwich loaves,	=> {vegetables}	0.1150132	0.8086420	1.093876
##	toilet paper}				
## [444]	{dishwashing liquid/detergent,	=> {vegetables}	0.1334504	0.8085106	1.093698
##	ice cream}				
## [445]	{dinner rolls,	=> {vegetables}	0.1369622	0.8082902	1.093400
##	shampoo}				
## [446]	{aluminum foil}	=> {vegetables}	0.3107989	0.8082192	1.093304
## [447]	{flour,	=> {vegetables}	0.1220369	0.8081395	1.093196
##	soap}				
## [448]	{milk,	=> {vegetables}	0.1220369	0.8081395	1.093196
##	pasta}				
## [449]	{fruits,	=> {vegetables}	0.1255487	0.8079096	1.092885
##	spaghetti sauce}				
## [450]	{beef,	=> {vegetables}	0.1255487	0.8079096	1.092885
##	paper towels}				
## [451]	{pasta,	=> {vegetables}	0.1290606	0.8076923	1.092591
##	soap}				
## [452]	{beef,	=> {vegetables}	0.1141352	0.8074534	1.092268
##	coffee/tea}				
## [453]	{beef,	=> {vegetables}	0.1141352	0.8074534	1.092268
##	laundry detergent}				
## [454]	{fruits,	=> {vegetables}	0.1176471	0.8072289	1.091964
##	sugar}				
## [455]	{ice cream,	=> {vegetables}	0.1395961	0.8071066	1.091799
##	waffles}				
## [456]	{individual meals,	=> {vegetables}	0.1431080	0.8069307	1.091561
##	lunch meat}				
## [457]	{ketchup,				

## spaghetti sauce}	=> {vegetables}	0.1246708	0.8068182	1.091408
## [458] {pork,	=> {vegetables}	0.1062335	0.8066667	1.091203
## sandwich loaves}				
## [459] {ice cream,	=> {vegetables}	0.1281826	0.8066298	1.091154
## spaghetti sauce}				
## [460] {milk,	=> {vegetables}	0.1281826	0.8066298	1.091154
## mixes}				
## [461] {lunch meat,	=> {vegetables}	0.1316945	0.8064516	1.090913
## tortillas}				
## [462] {bagels,	=> {vegetables}	0.1352063	0.8062827	1.090684
## fruits}				
## [463] {poultry,	=> {vegetables}	0.1387182	0.8061224	1.090467
## sandwich bags}				
## [464] {flour,	=> {vegetables}	0.1167691	0.8060606	1.090384
## waffles}				
## [465] {fruits,	=> {vegetables}	0.1237928	0.8057143	1.089915
## sandwich bags}				
## [466] {lunch meat,	=> {vegetables}	0.1237928	0.8057143	1.089915
## mixes}				
## [467] {dinner rolls,	=> {vegetables}	0.1273047	0.8055556	1.089700
## tortillas}				
## [468] {cereals,	=> {vegetables}	0.1273047	0.8055556	1.089700
## sandwich bags}				
## [469] {individual meals,	=> {vegetables}	0.1273047	0.8055556	1.089700
## spaghetti sauce}				
## [470] {bagels,	=> {vegetables}	0.1273047	0.8055556	1.089700
## ketchup}				
## [471] {ketchup,	=> {vegetables}	0.1273047	0.8055556	1.089700
## soda}				
## [472] {milk,	=> {vegetables}	0.1273047	0.8055556	1.089700
## spaghetti sauce}				
## [473] {toilet paper,	=> {vegetables}	0.1308165	0.8054054	1.089497
## yogurt}				
## [474] {bagels,	=> {vegetables}	0.1308165	0.8054054	1.089497
## cereals}				
## [475] {cereals,	=> {vegetables}	0.1308165	0.8054054	1.089497
## soap}				
## [476] {ice cream,	=> {vegetables}	0.1343284	0.8052632	1.089305
## soap}				
## [477] {dishwashing liquid/detergent,	=> {vegetables}	0.1343284	0.8052632	1.089305
## soda}				
## [478] {butter,	=> {vegetables}	0.1158911	0.8048780	1.088784
## paper towels}				
## [479] {butter,	=> {vegetables}	0.1194030	0.8047337	1.088589
## soap}				
## [480] {individual meals,	=> {vegetables}	0.1229148	0.8045977	1.088405
## tortillas}				
## [481] {aluminum foil,	=> {vegetables}	0.1264267	0.8044693	1.088231
## soap}				
## [482] {pasta,	=> {vegetables}	0.1299385	0.8043478	1.088067
## waffles}				
## [483] {bagels,	=> {vegetables}	0.1299385	0.8043478	1.088067
## milk}				
## [484] {butter,				



##	poultry}	=> {vegetables}	0.1334504	0.8042328	1.087911
## [485]	{aluminum foil,				
##	cereals}	=> {vegetables}	0.1334504	0.8042328	1.087911
## [486]	{hand soap,				
##	pork}	=> {vegetables}	0.1044776	0.8040541	1.087669
## [487]	{cereals,				
##	hand soap}	=> {vegetables}	0.1115013	0.8037975	1.087322
## [488]	{dishwashing liquid/detergent,				
##	hand soap}	=> {vegetables}	0.1150132	0.8036810	1.087165
## [489]	{dinner rolls,				
##	pork}	=> {vegetables}	0.1150132	0.8036810	1.087165
## [490]	{all- purpose,				
##	sandwich bags}	=> {vegetables}	0.1150132	0.8036810	1.087165
## [491]	{coffee/tea,				
##	flour}	=> {vegetables}	0.1220369	0.8034682	1.086877
## [492]	{coffee/tea,				
##	milk}	=> {vegetables}	0.1220369	0.8034682	1.086877
## [493]	{bagels,				
##	beef}	=> {vegetables}	0.1255487	0.8033708	1.086745
## [494]	{cereals,				
##	soda}	=> {vegetables}	0.1255487	0.8033708	1.086745
## [495]	{fruits,				
##	ice cream}	=> {vegetables}	0.1325724	0.8031915	1.086503
## [496]	{ketchup,				
##	poultry}	=> {vegetables}	0.1325724	0.8031915	1.086503
## [497]	{cereals,				
##	coffee/tea}	=> {vegetables}	0.1360843	0.8031088	1.086391
## [498]	{fruits,				
##	hand soap}	=> {vegetables}	0.1106234	0.8025478	1.085632
## [499]	{paper towels,				
##	tortillas}	=> {vegetables}	0.1141352	0.8024691	1.085525
## [500]	{juice,				
##	sandwich bags}	=> {vegetables}	0.1176471	0.8023952	1.085425
## [501]	{all- purpose,				
##	coffee/tea}	=> {vegetables}	0.1176471	0.8023952	1.085425
## [502]	{pasta,				
##	shampoo}	=> {vegetables}	0.1211589	0.8023256	1.085331
## [503]	{bagels,				
##	ice cream}	=> {vegetables}	0.1281826	0.8021978	1.085158
## [504]	{paper towels,				
##	pasta}	=> {vegetables}	0.1316945	0.8021390	1.085079
## [505]	{bagels,				
##	mixes}	=> {vegetables}	0.1316945	0.8021390	1.085079
## [506]	{soda,				
##	waffles}	=> {vegetables}	0.1422300	0.8019802	1.084864
## [507]	{flour,				
##	hand soap}	=> {vegetables}	0.1062335	0.8013245	1.083977
## [508]	{flour,				
##	spaghetti sauce}	=> {vegetables}	0.1062335	0.8013245	1.083977
## [509]	{flour,				
##	milk}	=> {vegetables}	0.1167691	0.8012048	1.083815
## [510]	{all- purpose,				
##	fruits}	=> {vegetables}	0.1202809	0.8011696	1.083767
## [511]	{mixes,				

##	soda}	=> {vegetables}	0.1202809	0.8011696	1.083767
##	[512] {all- purpose,				
##	ketchup}	=> {vegetables}	0.1237928	0.8011364	1.083722
##	[513] {fruits,				
##	waffles}	=> {vegetables}	0.1308165	0.8010753	1.083640
##	[514] {hand soap,				
##	spaghetti sauce}	=> {vegetables}	0.1158911	0.8000000	1.082185
##	[515] {flour,				
##	pork}	=> {vegetables}	0.1158911	0.8000000	1.082185
##	[516] {butter,				
##	pork}	=> {vegetables}	0.1088674	0.8000000	1.082185
##	[517] {paper towels,				
##	pork}	=> {vegetables}	0.1088674	0.8000000	1.082185
##	[518] {flour,				
##	ice cream}	=> {vegetables}	0.1158911	0.8000000	1.082185
##	[519] {poultry,				
##	tortillas}	=> {vegetables}	0.1369622	0.8000000	1.082185
##	[520] {fruits,				
##	shampoo}	=> {vegetables}	0.1123793	0.8000000	1.082185
##	[521] {fruits,				
##	mixes}	=> {vegetables}	0.1194030	0.8000000	1.082185
##	[522] {sandwich bags,				
##	toilet paper}	=> {vegetables}	0.1158911	0.8000000	1.082185
##	[523] {all- purpose,				
##	toilet paper}	=> {vegetables}	0.1229148	0.8000000	1.082185
##	[524] {individual meals,				
##	mixes}	=> {vegetables}	0.1194030	0.8000000	1.082185
##	[525] {mixes,				
##	paper towels}	=> {vegetables}	0.1264267	0.8000000	1.082185
##	[526] {dishwashing liquid/detergent,				
##	mixes}	=> {vegetables}	0.1439860	0.8000000	1.082185
##	[527] {waffles}	=> {vegetables}	0.3151888	0.7995546	1.081583
##	[528] {poultry,				
##	soap}	=> {vegetables}	0.1466198	0.7990431	1.080891
##	[529] {paper towels}	=> {vegetables}	0.2897278	0.7990315	1.080875
##	[530] {beef,				
##	fruits}	=> {vegetables}	0.1325724	0.7989418	1.080754
##	[531] {individual meals,				
##	soda}	=> {vegetables}	0.1325724	0.7989418	1.080754
##	[532] {spaghetti sauce,				
##	tortillas}	=> {vegetables}	0.1185250	0.7988166	1.080584
##	[533] {coffee/tea,				
##	hand soap}	=> {vegetables}	0.1115013	0.7987421	1.080484
##	[534] {ice cream,				
##	milk}	=> {vegetables}	0.1316945	0.7978723	1.079307
##	[535] {all- purpose,				
##	dishwashing liquid/detergent}	=> {vegetables}	0.1281826	0.7978142	1.079228
##	[536] {beef,				
##	milk}	=> {vegetables}	0.1281826	0.7978142	1.079228
##	[537] {toilet paper,				
##	tortillas}	=> {vegetables}	0.1246708	0.7977528	1.079145
##	[538] {cereals,				
##	juice}	=> {vegetables}	0.1246708	0.7977528	1.079145
##	[539] {hand soap,				

##	mixes}	=> {vegetables}	0.1211589	0.7976879	1.079058
## [540]	{dishwashing liquid/detergent,	=> {vegetables}	0.1211589	0.7976879	1.079058
##	flour}				
## [541]	{bagels,	=> {vegetables}	0.1211589	0.7976879	1.079058
##	butter}				
## [542]	{spaghetti sauce,	=> {vegetables}	0.1211589	0.7976879	1.079058
##	toilet paper}				
## [543]	{dinner rolls,	=> {vegetables}	0.1176471	0.7976190	1.078964
##	fruits}				
## [544]	{sandwich bags}	=> {vegetables}	0.2932397	0.7971360	1.078311
## [545]	{soap,				
##	toilet paper}	=> {vegetables}	0.1308165	0.7967914	1.077845
## [546]	{cheeses,				
##	flour}	=> {vegetables}	0.1273047	0.7967033	1.077726
## [547]	{coffee/tea,				
##	pasta}	=> {vegetables}	0.1237928	0.7966102	1.077600
## [548]	{beef,				
##	pasta}	=> {vegetables}	0.1167691	0.7964072	1.077325
## [549]	{all- purpose,				
##	flour}	=> {vegetables}	0.1132572	0.7962963	1.077175
## [550]	{individual meals,				
##	ketchup}	=> {vegetables}	0.1132572	0.7962963	1.077175
## [551]	{hand soap,				
##	tortillas}	=> {vegetables}	0.1097454	0.7961783	1.077016
## [552]	{pork,				
##	toilet paper}	=> {vegetables}	0.1097454	0.7961783	1.077016
## [553]	{cheeses,				
##	poultry}	=> {vegetables}	0.1439860	0.7961165	1.076932
## [554]	{coffee/tea,				
##	waffles}	=> {vegetables}	0.1369622	0.7959184	1.076664
## [555]	{ice cream,				
##	pasta}	=> {vegetables}	0.1334504	0.7958115	1.076519
## [556]	{cheeses,				
##	coffee/tea}	=> {vegetables}	0.1334504	0.7958115	1.076519
## [557]	{all- purpose,				
##	soap}	=> {vegetables}	0.1299385	0.7956989	1.076367
## [558]	{milk,				
##	toilet paper}	=> {vegetables}	0.1299385	0.7956989	1.076367
## [559]	{coffee/tea,				
##	soap}	=> {vegetables}	0.1264267	0.7955801	1.076206
## [560]	{coffee/tea,				
##	dinner rolls}	=> {vegetables}	0.1264267	0.7955801	1.076206
## [561]	{butter,				
##	soda}	=> {vegetables}	0.1229148	0.7954545	1.076036
## [562]	{spaghetti sauce}	=> {vegetables}	0.2967515	0.7952941	1.075819
## [563]	{sandwich bags,				
##	soda}	=> {vegetables}	0.1290606	0.7945946	1.074873
## [564]	{ice cream,				
##	individual meals}	=> {vegetables}	0.1290606	0.7945946	1.074873
## [565]	{milk,				
##	sandwich bags}	=> {vegetables}	0.1255487	0.7944444	1.074670
## [566]	{butter,				
##	ice cream}	=> {vegetables}	0.1220369	0.7942857	1.074455
## [567]	{all- purpose,				

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##      juice}                                => {vegetables} 0.1220369  0.7942857  1.074455
## [568] {coffee/tea,
##      dishwashing liquid/detergent} => {vegetables} 0.1220369  0.7942857  1.074455
## [569] {pork,
##      soap}                                => {vegetables} 0.1150132  0.7939394  1.073987
## [570] {beef,
##      poultry}                              => {vegetables} 0.1352063  0.7938144  1.073818
## [571] {cereals,
##      ice cream}                            => {vegetables} 0.1316945  0.7936508  1.073597
## [572] {cereals,
##      fruits}                              => {vegetables} 0.1281826  0.7934783  1.073363
## [573] {dishwashing liquid/detergent,
##      pasta}                              => {vegetables} 0.1281826  0.7934783  1.073363
## [574] {beef,
##      toilet paper}                        => {vegetables} 0.1246708  0.7932961  1.073117
## [575] {coffee/tea,
##      mixes}                              => {vegetables} 0.1176471  0.7928994  1.072580
## [576] {beef,
##      hand soap}                          => {vegetables} 0.1141352  0.7926829  1.072287
## [577] {all- purpose,
##      individual meals}                    => {vegetables} 0.1106234  0.7924528  1.071976
## [578] {dinner rolls}                          => {vegetables} 0.3081651  0.7923251  1.071803
## [579] {beef,
##      flour}                              => {vegetables} 0.1071115  0.7922078  1.071645
## [580] {cheeses,
##      milk}                              => {vegetables} 0.1237928  0.7921348  1.071546
## [581] {pork,
##      waffles}                            => {vegetables} 0.1202809  0.7919075  1.071238
## [582] {all- purpose,
##      mixes}                              => {vegetables} 0.1202809  0.7919075  1.071238
## [583] {bagels,
##      coffee/tea}                          => {vegetables} 0.1202809  0.7919075  1.071238
## [584] {milk,
##      soda}                              => {vegetables} 0.1369622  0.7918782  1.071199
## [585] {pasta,
##      sandwich bags}                      => {vegetables} 0.1167691  0.7916667  1.070913
## [586] {beef,
##      cereals}                            => {vegetables} 0.1334504  0.7916667  1.070913
## [587] {ice cream,
##      soda}                              => {vegetables} 0.1334504  0.7916667  1.070913
## [588] {milk,
##      pork}                              => {vegetables} 0.1132572  0.7914110  1.070567
## [589] {all- purpose,
##      lunch meat}                        => {vegetables} 0.1264267  0.7912088  1.070293
## [590] {cereals,
##      individual meals}                    => {vegetables} 0.1264267  0.7912088  1.070293
## [591] {hand soap,
##      soda}                              => {vegetables} 0.1097454  0.7911392  1.070199
## [592] {cheeses,
##      hand soap}                        => {vegetables} 0.1097454  0.7911392  1.070199
## [593] {cheeses}                              => {vegetables} 0.3090430  0.7910112  1.070026
## [594] {mixes,
##      pork}                              => {vegetables} 0.1229148  0.7909605  1.069957
## [595] {bagels,

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##	pork}	=> {vegetables}	0.1229148	0.7909605	1.069957
##	[596] {shampoo,	=> {vegetables}	0.1062335	0.7908497	1.069807
##	tortillas}				
##	[597] {juice,	=> {vegetables}	0.1360843	0.7908163	1.069762
##	toilet paper}				
##	[598] {all- purpose,	=> {vegetables}	0.1325724	0.7905759	1.069437
##	waffles}				
##	[599] {aluminum foil,	=> {vegetables}	0.1158911	0.7904192	1.069225
##	pork}				
##	[600] {butter,	=> {vegetables}	0.1158911	0.7904192	1.069225
##	tortillas}				
##	[601] {pork,	=> {vegetables}	0.1123793	0.7901235	1.068825
##	shampoo}				
##	[602] {flour,	=> {vegetables}	0.1123793	0.7901235	1.068825
##	tortillas}				
##	[603] {cereals,	=> {vegetables}	0.1255487	0.7900552	1.068733
##	tortillas}				
##	[604] {dishwashing liquid/detergent,	=> {vegetables}	0.1255487	0.7900552	1.068733
##	individual meals}				
##	[605] {coffee/tea,	=> {vegetables}	0.1255487	0.7900552	1.068733
##	soda}				
##	[606] {all- purpose,	=> {vegetables}	0.1387182	0.7900000	1.068658
##	poultry}				
##	[607] {hand soap,	=> {vegetables}	0.1220369	0.7897727	1.068351
##	poultry}				
##	[608] {individual meals,	=> {vegetables}	0.1220369	0.7897727	1.068351
##	paper towels}				
##	[609] {dishwashing liquid/detergent}	=> {vegetables}	0.3064091	0.7895928	1.068107
##	[610] {ice cream,				
##	juice}	=> {vegetables}	0.1316945	0.7894737	1.067946
##	[611] {butter,	=> {vegetables}	0.1150132	0.7891566	1.067517
##	shampoo}				
##	[612] {cereals,	=> {vegetables}	0.1378402	0.7889447	1.067230
##	cheeses}	=> {vegetables}	0.3116769	0.7888889	1.067155
##	[613] {lunch meat}				
##	[614] {fruits,	=> {vegetables}	0.1115013	0.7888199	1.067062
##	tortillas}				
##	[615] {ketchup,	=> {vegetables}	0.1211589	0.7885714	1.066725
##	pork}				
##	[616] {milk,	=> {vegetables}	0.1273047	0.7880435	1.066011
##	soap}				
##	[617] {fruits,	=> {vegetables}	0.1141352	0.7878788	1.065789
##	individual meals}				
##	[618] {all- purpose,	=> {vegetables}	0.1141352	0.7878788	1.065789
##	beef}				
##	[619] {juice,	=> {vegetables}	0.1237928	0.7877095	1.065560
##	soda}				
##	[620] {fruits,	=> {vegetables}	0.1009658	0.7876712	1.065508
##	pork}				
##	[621] {beef,	=> {vegetables}	0.1009658	0.7876712	1.065508
##	butter}	=> {vegetables}	0.3318701	0.7875000	1.065276
##	[622] {poultry}				
##	[623] {butter,	=> {vegetables}	0.1106234	0.7875000	1.065276
##	pasta}				

## [624] {mixes}	=> {vegetables}	0.2958736	0.7873832	1.065118
## [625] {coffee/tea, sandwich bags}	=> {vegetables}	0.1202809	0.7873563	1.065082
## [626] {coffee/tea, individual meals}	=> {vegetables}	0.1202809	0.7873563	1.065082
## [627] {individual meals, toilet paper}	=> {vegetables}	0.1202809	0.7873563	1.065082
## [628] {all- purpose, hand soap}	=> {vegetables}	0.1071115	0.7870968	1.064731
## [629] {hand soap, milk}	=> {vegetables}	0.1167691	0.7869822	1.064576
## [630] {coffee/tea, pork}	=> {vegetables}	0.1167691	0.7869822	1.064576
## [631] {coffee/tea, fruits}	=> {vegetables}	0.1132572	0.7865854	1.064039
## [632] {beef, sandwich bags}	=> {vegetables}	0.1229148	0.7865169	1.063946
## [633] {all- purpose, pasta}	=> {vegetables}	0.1255487	0.7857143	1.062861
## [634] {fruits, poultry}	=> {vegetables}	0.1316945	0.7853403	1.062355
## [635] {cheeses, toilet paper}	=> {vegetables}	0.1316945	0.7853403	1.062355
## [636] {cereals}	=> {vegetables}	0.3107989	0.7849224	1.061789
## [637] {ketchup, shampoo}	=> {vegetables}	0.1185250	0.7848837	1.061737
## [638] {ketchup}	=> {vegetables}	0.2914838	0.7848700	1.061718
## [639] {hand soap, sandwich bags}	=> {vegetables}	0.1088674	0.7848101	1.061637
## [640] {fruits, toilet paper}	=> {vegetables}	0.1088674	0.7848101	1.061637
## [641] {fruits}	=> {vegetables}	0.2906058	0.7843602	1.061029
## [642] {flour, individual meals}	=> {vegetables}	0.1115013	0.7839506	1.060475
## [643] {fruits, soda}	=> {vegetables}	0.1176471	0.7836257	1.060035
## [644] {flour}	=> {vegetables}	0.2765584	0.7835821	1.059976
## [645] {bagels, shampoo}	=> {vegetables}	0.1237928	0.7833333	1.059640
## [646] {all- purpose, pork}	=> {vegetables}	0.1202809	0.7828571	1.058996
## [647] {individual meals, pork}	=> {vegetables}	0.1106234	0.7826087	1.058660
## [648] {butter, dishwashing liquid/detergent}	=> {vegetables}	0.1167691	0.7823529	1.058314
## [649] {shampoo, toilet paper}	=> {vegetables}	0.1229148	0.7821229	1.058002
## [650] {soda}	=> {vegetables}	0.3055312	0.7820225	1.057867
## [651] {individual meals, milk}	=> {vegetables}	0.1132572	0.7818182	1.057590
## [652] {hand soap}	=> {vegetables}	0.2704126	0.7817259	1.057465
## [653] {toilet paper, waffles}	=> {vegetables}	0.1352063	0.7817259	1.057465
## [654] {soap,				

##	tortillas}	=> {vegetables}	0.1158911	0.7810651	1.056571
## [655]	{shampoo}	=> {vegetables}	0.2879719	0.7809524	1.056419
## [656]	{juice}	=> {vegetables}	0.2941176	0.7808858	1.056329
## [657]	{pork,				
##	poultry}	=> {vegetables}	0.1281826	0.7807487	1.056143
## [658]	{lunch meat,				
##	toilet paper}	=> {vegetables}	0.1281826	0.7807487	1.056143
## [659]	{butter,				
##	lunch meat}	=> {vegetables}	0.1246708	0.7802198	1.055428
## [660]	{butter,				
##	cheeses}	=> {vegetables}	0.1246708	0.7802198	1.055428
## [661]	{ice cream,				
##	toilet paper}	=> {vegetables}	0.1246708	0.7802198	1.055428
## [662]	{bagels,				
##	cheeses}	=> {vegetables}	0.1308165	0.7801047	1.055272
## [663]	{butter,				
##	hand soap}	=> {vegetables}	0.1027217	0.7800000	1.055131
## [664]	{bagels}	=> {vegetables}	0.3002634	0.7790433	1.053836
## [665]	{aluminum foil,				
##	individual meals}	=> {vegetables}	0.1264267	0.7783784	1.052937
## [666]	{milk}	=> {vegetables}	0.2958736	0.7782910	1.052819
## [667]	{soap}	=> {vegetables}	0.2949956	0.7777778	1.052125
## [668]	{pork,				
##	sandwich bags}	=> {vegetables}	0.1167691	0.7777778	1.052125
## [669]	{cheeses,				
##	pork}	=> {vegetables}	0.1167691	0.7777778	1.052125
## [670]	{flour,				
##	toilet paper}	=> {vegetables}	0.1106234	0.7777778	1.052125
## [671]	{cereals,				
##	milk}	=> {vegetables}	0.1352063	0.7777778	1.052125
## [672]	{beef}	=> {vegetables}	0.2914838	0.7775176	1.051773
## [673]	{beef,				
##	tortillas}	=> {vegetables}	0.1097454	0.7763975	1.050257
## [674]	{cheeses,				
##	tortillas}	=> {vegetables}	0.1123793	0.7757576	1.049392
## [675]	{ketchup,				
##	pasta}	=> {vegetables}	0.1211589	0.7752809	1.048747
## [676]	{coffee/tea,				
##	toilet paper}	=> {vegetables}	0.1211589	0.7752809	1.048747
## [677]	{milk,				
##	tortillas}	=> {vegetables}	0.1176471	0.7745665	1.047781
## [678]	{fruits,				
##	juice}	=> {vegetables}	0.1053556	0.7741935	1.047276
## [679]	{individual meals,				
##	juice}	=> {vegetables}	0.1202809	0.7740113	1.047030
## [680]	{ice cream,				
##	tortillas}	=> {vegetables}	0.1141352	0.7738095	1.046757
## [681]	{hand soap,				
##	ice cream}	=> {vegetables}	0.1106234	0.7730061	1.045670
## [682]	{bagels,				
##	tortillas}	=> {vegetables}	0.1255487	0.7729730	1.045625
## [683]	{soda,				
##	toilet paper}	=> {vegetables}	0.1255487	0.7729730	1.045625
## [684]	{all- purpose}	=> {vegetables}	0.2897278	0.7728337	1.045437

## [685] {coffee/tea,	=> {vegetables} 0.1194030	0.7727273	1.045293
## tortillas}			
## [686] {beef,	=> {vegetables} 0.1194030	0.7727273	1.045293
## dinner rolls}			
## [687] {mixes,	=> {vegetables} 0.1132572	0.7724551	1.044924
## pasta}			
## [688] {beef,	=> {vegetables} 0.1158911	0.7719298	1.044214
## pork}			
## [689] {all- purpose,	=> {vegetables} 0.1123793	0.7710843	1.043070
## tortillas}			
## [690] {ketchup,	=> {vegetables} 0.1123793	0.7710843	1.043070
## tortillas}			
## [691] {butter}	=> {vegetables} 0.2835821	0.7708831	1.042798
## [692] {pasta}	=> {vegetables} 0.2862160	0.7706856	1.042531
## [693] {pasta,			
## toilet paper}	=> {vegetables} 0.1150132	0.7705882	1.042399
## [694] {beef,			
## mixes}	=> {vegetables} 0.1115013	0.7696970	1.041193
## [695] {juice,			
## pork}	=> {vegetables} 0.1202809	0.7696629	1.041147
## [696] {pork,			
## soda}	=> {vegetables} 0.1141352	0.7692308	1.040563
## [697] {all- purpose,			
## shampoo}	=> {vegetables} 0.1167691	0.7687861	1.039961
## [698] {all- purpose,			
## butter}	=> {vegetables} 0.1132572	0.7678571	1.038705
## [699] {tortillas}	=> {vegetables} 0.2835821	0.7672209	1.037844
## [700] {cereals,			
## pork}	=> {vegetables} 0.1150132	0.7660819	1.036303
## [701] {coffee/tea,			
## ice cream}	=> {vegetables} 0.1264267	0.7659574	1.036135
## [702] {ice cream,			
## mixes}	=> {vegetables} 0.1176471	0.7657143	1.035806
## [703] {toilet paper}	=> {vegetables} 0.2897278	0.7656613	1.035734
## [704] {sandwich bags,			
## tortillas}	=> {vegetables} 0.1229148	0.7650273	1.034877
## [705] {coffee/tea}	=> {vegetables} 0.2897278	0.7638889	1.033337
## [706] {soda,			
## tortillas}	=> {vegetables} 0.1185250	0.7627119	1.031744
## [707] {mixes,			
## tortillas}	=> {vegetables} 0.1237928	0.7621622	1.031001
## [708] {butter,			
## toilet paper}	=> {vegetables} 0.1176471	0.7613636	1.029921
## [709] {pork}	=> {vegetables} 0.2704126	0.7604938	1.028744
## [710] {ice cream}	=> {vegetables} 0.3028973	0.7599119	1.027957
## [711] {individual meals}	=> {vegetables} 0.2853380	0.7593458	1.027191
## [712] {ice cream,			
## pork}	=> {vegetables} 0.1062335	0.7562500	1.023003
## [713] {pork,			
## tortillas}	=> {vegetables} 0.1115013	0.7559524	1.022601
## [714] {pasta,			
## tortillas}	=> {vegetables} 0.1150132	0.7528736	1.018436
## [715] {butter,			
## individual meals}	=> {vegetables} 0.1106234	0.7500000	1.014549



```
## [716] {} => {vegetables} 0.7392450 0.7392450 1.000000
```

```
inspect(subset(rules1, !(rhs %in% "vegetables")))
```

	lhs	rhs	support	confidence	lift
## [1]	{soda, vegetables}	=> {eggs}	0.1580334	0.5172414	1.326887
## [2]	{dinner rolls, vegetables}	=> {eggs}	0.1562774	0.5071225	1.300929
## [3]	{pasta, vegetables}	=> {eggs}	0.1439860	0.5030675	1.290527
## [4]	{dishwashing liquid/detergent, vegetables}	=> {eggs}	0.1536435	0.5014327	1.286333
## [5]	{lunch meat, vegetables}	=> {waffles}	0.1571554	0.5042254	1.279093
## [6]	{individual meals, vegetables}	=> {lunch meat}	0.1431080	0.5015385	1.269450
## [7]	{mixes, vegetables}	=> {poultry}	0.1562774	0.5281899	1.253351
## [8]	{dinner rolls, vegetables}	=> {poultry}	0.1615452	0.5242165	1.243922
## [9]	{dishwashing liquid/detergent, vegetables}	=> {poultry}	0.1597893	0.5214900	1.237452
## [10]	{sugar, vegetables}	=> {poultry}	0.1518876	0.5103245	1.210957
## [11]	{lunch meat, vegetables}	=> {poultry}	0.1580334	0.5070423	1.203169
## [12]	{dinner rolls}	=> {poultry}	0.1949078	0.5011287	1.189137
## [13]	{sandwich loaves, vegetables}	=> {poultry}	0.1413521	0.5000000	1.186458

```
basket2 <- dcast(basket, user_id ~ pdt)
```

```
## Using month as value column: use value.var to override.
```

```
## Aggregation function missing: defaulting to length
```

```
basket2 <- basket2 %>% select(-c(user_id,vegetables))
```

```
basket2 <- data.matrix(basket2)
```

```
basket_txn2 <- as(basket2, "itemMatrix")
```

```
## Warning in asMethod(object): matrix contains values other than 0 and 1!
```

```
## Setting all entries != 0 to 1.
```

```
rules2 <- apriori(basket_txn2, parameter = list(support = 0.15, confidence = 0.4))
```

```
## Apriori
```

```
##
```

```
## Parameter specification:
```

```
## confidence minval smax arem aval originalSupport maxtime support minlen
```

```
## 0.4 0.1 1 none FALSE TRUE 5 0.15 1
```

```
## maxlen target ext
```

```
## 10 rules FALSE
```

```
##
```

```
## Algorithmic control:
```

```
## filter tree heap memopt load sort verbose
```

```
##      0.1 TRUE TRUE  FALSE TRUE      2      TRUE
##
## Absolute minimum support count: 170
##
## set item appearances ...[0 item(s)] done [0.00s].
## set transactions ...[37 item(s), 1139 transaction(s)] done [0.00s].
## sorting and recoding items ... [37 item(s)] done [0.00s].
## creating transaction tree ... done [0.00s].
## checking subsets of size 1 2 3 done [0.00s].
## writing ... [831 rule(s)] done [0.00s].
## creating S4 object ... done [0.00s].
```

```
rules2 <- sort(rules2, by = "lift", decreasing = TRUE)
inspect(rules2[10:40])
```

	lhs	rhs	support	confidence
## [1]	{pasta}	=> {paper towels}	0.1641791	0.4420804
## [2]	{juice}	=> {yogurt}	0.1764706	0.4685315
## [3]	{yogurt}	=> {juice}	0.1764706	0.4589041
## [4]	{sandwich loaves}	=> {individual meals}	0.1597893	0.4572864
## [5]	{individual meals}	=> {sandwich loaves}	0.1597893	0.4252336
## [6]	{toilet paper}	=> {juice}	0.1720808	0.4547564
## [7]	{juice}	=> {toilet paper}	0.1720808	0.4568765
## [8]	{ketchup}	=> {sandwich bags}	0.1641791	0.4420804
## [9]	{sandwich bags}	=> {ketchup}	0.1641791	0.4463007
## [10]	{aluminum foil}	=> {yogurt}	0.1773486	0.4611872
## [11]	{yogurt}	=> {aluminum foil}	0.1773486	0.4611872
## [12]	{pasta}	=> {dinner rolls}	0.1729587	0.4657210
## [13]	{dinner rolls}	=> {pasta}	0.1729587	0.4446953
## [14]	{fruits}	=> {beef}	0.1659350	0.4478673
## [15]	{beef}	=> {fruits}	0.1659350	0.4426230
## [16]	{individual meals}	=> {lunch meat}	0.1773486	0.4719626
## [17]	{lunch meat}	=> {individual meals}	0.1773486	0.4488889
## [18]	{sandwich loaves}	=> {soap}	0.1580334	0.4522613
## [19]	{soap}	=> {sandwich loaves}	0.1580334	0.4166667
## [20]	{mixes}	=> {aluminum foil}	0.1720808	0.4579439
## [21]	{aluminum foil}	=> {mixes}	0.1720808	0.4474886
## [22]	{dinner rolls}	=> {poultry}	0.1949078	0.5011287
## [23]	{poultry}	=> {dinner rolls}	0.1949078	0.4625000
## [24]	{juice}	=> {aluminum foil}	0.1720808	0.4568765
## [25]	{aluminum foil}	=> {juice}	0.1720808	0.4474886
## [26]	{spaghetti sauce}	=> {dinner rolls}	0.1720808	0.4611765
## [27]	{dinner rolls}	=> {spaghetti sauce}	0.1720808	0.4424379
## [28]	{lunch meat}	=> {waffles}	0.1843723	0.4666667
## [29]	{waffles}	=> {lunch meat}	0.1843723	0.4677060
## [30]	{ketchup}	=> {mixes}	0.1650571	0.4444444
## [31]	{mixes}	=> {ketchup}	0.1650571	0.4392523
##	lift			
## [1]	1.219200			
## [2]	1.218396			
## [3]	1.218396			
## [4]	1.216937			
## [5]	1.216937			
## [6]	1.207383			
## [7]	1.207383			

```
## [8] 1.201741
## [9] 1.201741
## [10] 1.199297
## [11] 1.199297
## [12] 1.197418
## [13] 1.197418
## [14] 1.194662
## [15] 1.194662
## [16] 1.194590
## [17] 1.194590
## [18] 1.192420
## [19] 1.192420
## [20] 1.190863
## [21] 1.190863
## [22] 1.189137
## [23] 1.189137
## [24] 1.188087
## [25] 1.188087
## [26] 1.185734
## [27] 1.185734
## [28] 1.183816
## [29] 1.183816
## [30] 1.182762
## [31] 1.182762
```