R Notebook

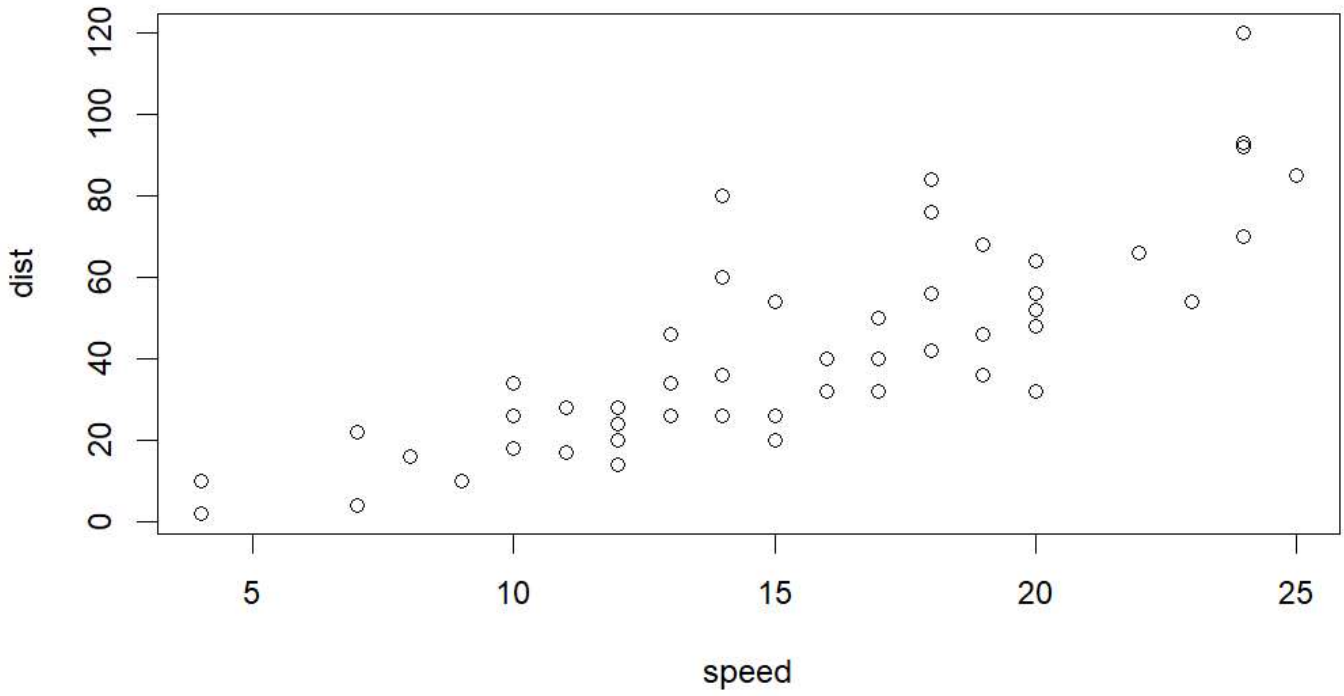
Code

This is an R Markdown (http://rmarkdown.rstudio.com) Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

Hide

```
plot(cars)
```



Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Ctrl+Alt+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Ctrl+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.

Hide

```
c <- 1+78
c
```

```
[1] 79
```

Hide

```
b <- 85+25
b
```

```
[1] 110
```

Hide

```
library(arules)
```

```
Loading required package: Matrix

Attaching package: ‘arules’

The following objects are masked from ‘package:base’:

    abbreviate, write
```

Hide

```
library(arulesViz)
```

Hide

```
market_basket<- read.transactions(

  file= "C:/PRASAD wORKS/R Studiio Works/data set in r-20231213T060837Z-001/data set in r/market
_basket.csv",
  sep=',',
  quote="",
  format = 'basket',
  rm.duplicates =TRUE,
  skip=1

)
```

```
distribution of transactions with duplicates:
items
   1    2    3    4    5    6    7    8    9   10   11   12
1029  473  266  159   83   61   52   32   16   15   10   11
  13   14   15   16   17   18   20   22   23   25   27   34
   4    3    2    1    5    1    1    1    2    1    1    1
  52
   1
```

Hide

```
summary(market_basket)
```

```
transactions as itemMatrix in sparse format with
 18440 rows (elements/itemsets/transactions) and
 22346 columns (items) and a density of 0.0009915565

most frequent items:
WHITE HANGING HEART T-LIGHT HOLDER
                             1971
          REGENCY CAKESTAND 3 TIER
                             1703
           JUMBO BAG RED RETROSPOT
                             1598
                     PARTY BUNTING
                             1379
     ASSORTED COLOUR BIRD ORNAMENT
                             1375
                           (Other)
                            400555

element (itemset/transaction) length distribution:
sizes
   2    3    4    5    6    7    8    9   10   11   12   13
1359  715  602  616  660  588  568  584  608  508  542  499
  14   15   16   17   18   19   20   21   22   23   24   25
 475  509  543  544  466  433  477  420  409  341  327  311
  26   27   28   29   30   31   32   33   34   35   36   37
 239  266  250  216  264  232  196  170  165  170  144  124
  38   39   40   41   42   43   44   45   46   47   48   49
 128  110  123  121  111  106   94   92   83   89   82   79
  50   51   52   53   54   55   56   57   58   59   60   61
  73   79   62   55   64   67   62   48   53   46   47   37
  62   63   64   65   66   67   68   69   70   71   72   73
  45   35   31   33   32   39   38   34   23   30   30   14
  74   75   76   77   78   79   80   81   82   83   84   85
  25   32   24   20   18   16    9   16   18   19   16   18
  86   87   88   89   90   91   92   93   94   95   96   97
  15   11   14   13    9    8   11   15   12    9    5    8
  98   99  100  101  102  103  104  105  106  107  108  109
  10   10    3    7   11    3    9    7    2    3    3    6
 110  111  112  113  114  115  116  117  118  119  120  121
   4    3    3    2    5    4    4    8    5    5    5    5
 122  123  124  125  126  127  128  129  131  133  134  135
   4    8    5    1    4    5    3    4    2    1    4    1
 136  137  138  139  140  141  142  143  144  145  147  149
   1    3    2    2    1    2    2    2    2    1    5    1
 150  151  152  153  156  158  159  160  165  166  167  168
   1    1    2    1    1    1    1    1    1    1    1    1
 170  171  172  178  179  181  182  186  188  194  195  197
   1    1    1    2    2    1    2    1    1    1    1    1
 205  206  209  212  221  231  251  260  264  274  284  334
   1    1    1    1    1    1    1    1    1    1    1    1
 340  352  357  367  380  423  441  443  530  534  548
   1    1    1    1    1    1    1    1    1    1    1
```

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
   2.00    8.00   16.00   22.16   28.00  548.00 
```

includes extended item information - examples:

	labels <chr>
1	"ASSORTED FLOWER COLOUR ""LEIS"""
2	"CHARLIE+LOLA""EXTREMELY BUSY"" SIGN"
3	"FLOWER GLASS GARLAND NECKL.36""BLACK"

3 rows

Hide

```
library(dplyr)
```

```
Attaching package: ‘dplyr’

The following objects are masked from ‘package:arules’:

    intersect, recode, setdiff, setequal, union

The following objects are masked from ‘package:stats’:

    filter, lag

The following objects are masked from ‘package:base’:

    intersect, setdiff, setequal, union
```

Hide

```
market_basket %>% head(n=5) %>% inspect()
```

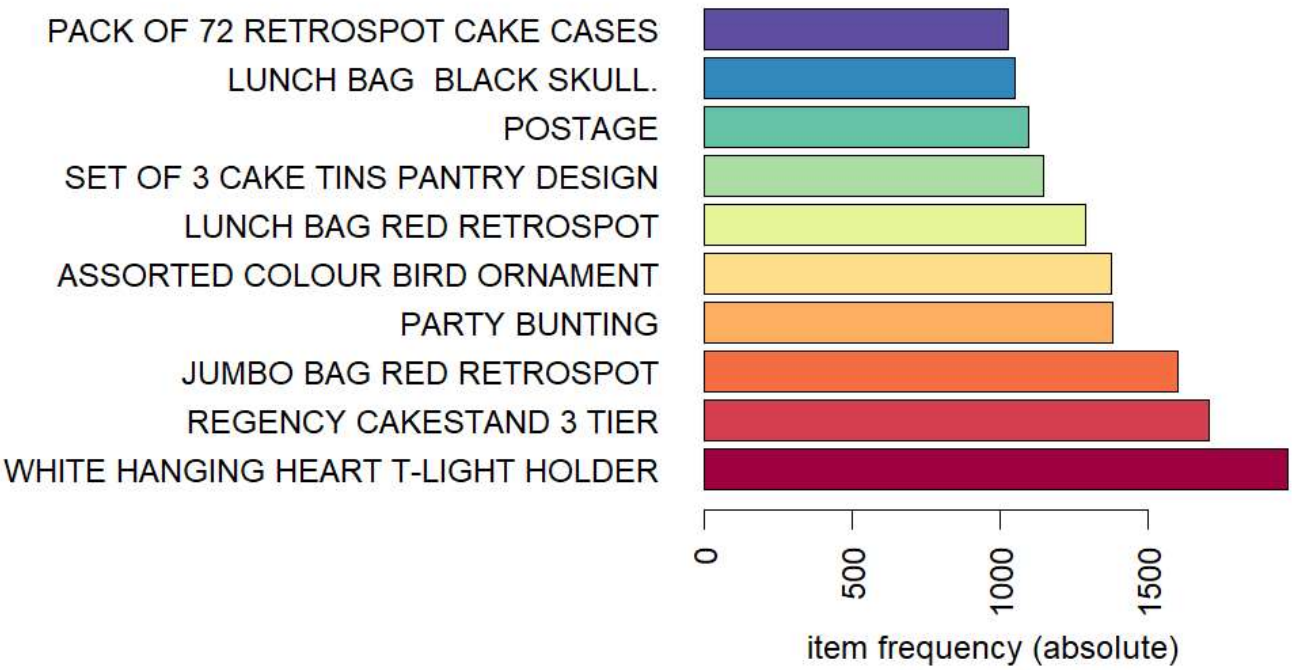
```
    items
[1] {1,
     MEDIUM CERAMIC TOP STORAGE JAR}
[2] {2,
     3D DOG PICTURE PLAYING CARDS,
     AIRLINE BAG VINTAGE JET SET BROWN,
     ALARM CLOCK BAKELIKE CHOCOLATE,
     ALARM CLOCK BAKELIKE GREEN,
     ALARM CLOCK BAKELIKE ORANGE,
     ALARM CLOCK BAKELIKE PINK,
     ALARM CLOCK BAKELIKE RED,
     BATHROOM METAL SIGN,
     BLACK CANDELABRA T-LIGHT HOLDER,
     BLACK EAR MUFF HEADPHONES,
     BLACK GRAND BAROQUE PHOTO FRAME,
     BLUE 3 PIECE POLKADOT CUTLERY SET,
     BLUE DRAWER KNOB ACRYLIC EDWARDIAN,
     BOOM BOX SPEAKER BOYS,
     BOX OF 6 ASSORTED COLOUR TEASPOONS,
     CAMOUFLAGE EAR MUFF HEADPHONES,
     CLEAR DRAWER KNOB ACRYLIC EDWARDIAN,
     COLOUR GLASS. STAR T-LIGHT HOLDER,
     EMERGENCY FIRST AID TIN,
     FOUR HOOK  WHITE LOVEBIRDS,
     GREEN DRAWER KNOB ACRYLIC EDWARDIAN,
     LARGE HEART MEASURING SPOONS,
     MINI PAINT SET VINTAGE,
     PINK 3 PIECE POLKADOT CUTLERY SET,
     PINK DRAWER KNOB ACRYLIC EDWARDIAN,
     PURPLE DRAWERKNOB ACRYLIC EDWARDIAN,
     RED 3 PIECE RETROSPOT CUTLERY SET,
     RED DRAWER KNOB ACRYLIC EDWARDIAN,
     RED TOADSTOOL LED NIGHT LIGHT,
     SET OF 2 TINS VINTAGE BATHROOM,
     SET/3 DECOUPAGE STACKING TINS}
[3] {3,
     3D DOG PICTURE PLAYING CARDS,
     60 TEATIME FAIRY CAKE CASES,
     72 SWEETHEART FAIRY CAKE CASES,
     AIRLINE BAG VINTAGE JET SET BROWN,
     AIRLINE BAG VINTAGE JET SET WHITE,
     ALARM CLOCK BAKELIKE CHOCOLATE,
     ALARM CLOCK BAKELIKE GREEN,
     ALARM CLOCK BAKELIKE ORANGE,
     ALARM CLOCK BAKELIKE PINK,
     ALARM CLOCK BAKELIKE RED,
     BLACK CANDELABRA T-LIGHT HOLDER,
     BLUE NEW BAROQUE CANDLESTICK CANDLE,
     BOX OF 6 ASSORTED COLOUR TEASPOONS,
     CHOCOLATE CALCULATOR,
     MINI LADLE LOVE HEART RED,
     PACK OF 60 MUSHROOM CAKE CASES,
```

     PACK OF 60 SPACEBOY CAKE CASES,
     PINK NEW BAROQUECANDLESTICK CANDLE,
     RED RETROSPOT OVEN GLOVE,
     RED RETROSPOT OVEN GLOVE DOUBLE,
     RED TOADSTOOL LED NIGHT LIGHT,
     REGENCY CAKESTAND 3 TIER,
     SANDWICH BATH SPONGE,
     SET OF 2 TINS VINTAGE BATHROOM,
     SET/2 RED RETROSPOT TEA TOWELS,
     SMALL HEART MEASURING SPOONS,
     TEA TIME OVEN GLOVE,
     TOOTHPASTE TUBE PEN,
     WOODLAND CHARLOTTE BAG}
[4] {3D SHEET OF CAT STICKERS,
     3D SHEET OF DOG STICKERS,
     4,
     AIRLINE BAG VINTAGE JET SET BROWN,
     AIRLINE BAG VINTAGE JET SET RED,
     AIRLINE BAG VINTAGE JET SET WHITE,
     AIRLINE BAG VINTAGE TOKYO 78,
     GIFT BAG PSYCHEDELIC APPLES,
     HOLIDAY FUN LUDO,
     ICE CREAM SUNDAE LIP GLOSS,
     LARGE HEART MEASURING SPOONS,
     MINI PAINT SET VINTAGE,
     PACK OF 60 DINOSAUR CAKE CASES,
     RED DRAWER KNOB ACRYLIC EDWARDIAN,
     RED RETROSPOT OVEN GLOVE DOUBLE,
     RED RETROSPOT PURSE,
     RED TOADSTOOL LED NIGHT LIGHT,
     REGENCY CAKESTAND 3 TIER,
     ROSES REGENCY TEACUP AND SAUCER,
     SET OF 2 TINS VINTAGE BATHROOM,
     SMALL FOLDING SCISSOR(POINTED EDGE),
     SMALL HEART MEASURING SPOONS,
     TREASURE ISLAND BOOK BOX,
     VINTAGE HEADS AND TAILS CARD GAME,
     WATERING CAN PINK BUNNY}
[5] {3D DOG PICTURE PLAYING CARDS,
     5,
     AIRLINE BAG VINTAGE JET SET BROWN,
     AIRLINE BAG VINTAGE TOKYO 78,
     ALARM CLOCK BAKELIKE CHOCOLATE,
     ALARM CLOCK BAKELIKE RED,
     COAL BLACK,
     FEATHER PEN,
     NAMASTE SWAGAT INCENSE,
     RABBIT NIGHT LIGHT,
     REGENCY MILK JUG PINK,
     REGENCY SUGAR BOWL GREEN,
     REGENCY TEA PLATE GREEN,
     REGENCY TEA PLATE PINK,

```
REGENCY TEA PLATE ROSES,
REGENCY TEA STRAINER,
REGENCY TEAPOT ROSES,
SMALL HEART MEASURING SPOONS,
TRIPLE HOOK ANTIQUE IVORY ROSE,
VICTORIAN SEWING KIT}
```

Hide

```
library(RColorBrewer)
library(arules)
itemFrequencyPlot(x     = market_basket,
                  topN   =10,
                  type = 'absolute',
                  horiz = TRUE,
                  col = brewer.pal(10,'Spectral')
                  )
```



Hide

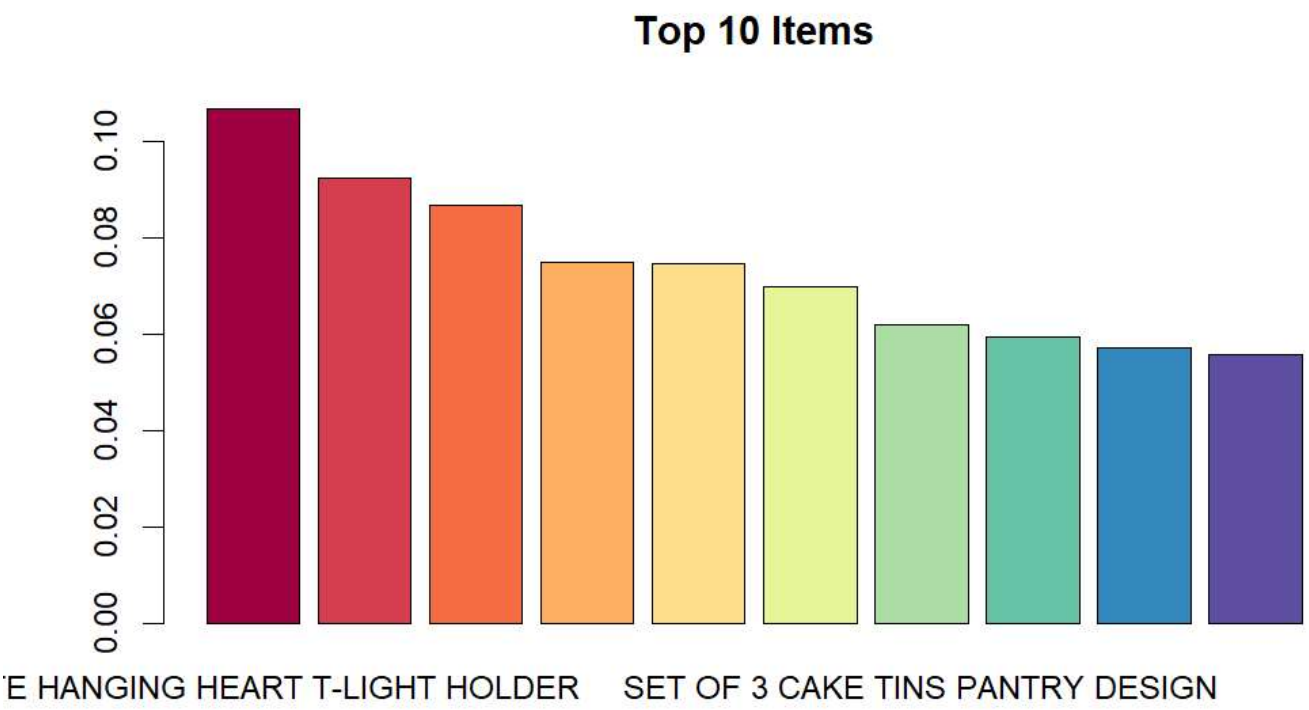
```
library(RColorBrewer)
library(arules)

# Assuming market_basket is your transaction data

# Calculate item frequencies
item_freq <- itemFrequency(market_basket)

# Get top N items
top_items <- head(sort(item_freq, decreasing = TRUE), 10)

# Create a bar plot with colors
barplot(top_items, col = brewer.pal(10, 'Spectral'), main = 'Top 10 Items')
```



Hide

```
rule1 <- market_basket %>%
  apriori(parameter = list(supp=0.005, conf =0.8)) %>%
  sort(by = "confidence")
```

```
Apriori

Parameter specification:
```

confidence <dbl>	minval <dbl>	s… <dbl>	ar… <chr>	aval <lgl>	originalSupport <lgl>	maxtime <dbl>	support <dbl>	minlen <int>
0.8	0.1	1	none	FALSE	TRUE	5	0.005	1

1 row | 1-10 of 12 columns

```
Algorithmic control:
```

filter <dbl>	tree <lgl>	heap <lgl>	memopt <lgl>	load <lgl>	sort <int>	verbose <lgl>
0.1	TRUE	TRUE	FALSE	TRUE	2	TRUE

1 row

```
Absolute minimum support count: 92

set item appearances ...[0 item(s)] done [0.00s].
set transactions ...[22346 item(s), 18440 transaction(s)] done [0.23s].
sorting and recoding items ... [1257 item(s)] done [0.02s].
creating transaction tree ... done [0.01s].
checking subsets of size 1 2 3 4 5 6 done [0.07s].
writing ... [561 rule(s)] done [0.01s].
creating S4 object  ... done [0.00s].
```

Hide

```
summary(rule1)
```

```
set of 561 rules

rule length distribution (lhs + rhs):sizes
  2   3   4   5   6
 64 201 211  79   6

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  2.000   3.000   4.000   3.576   4.000   6.000

summary of quality measures:
    support           confidence        coverage
 Min.   :0.005043   Min.   :0.8000   Min.   :0.005152
 1st Qu.:0.005477   1st Qu.:0.8362   1st Qu.:0.006345
 Median :0.006562   Median :0.8962   Median :0.007538
 Mean   :0.007055   Mean   :0.8936   Mean   :0.007899
 3rd Qu.:0.007972   3rd Qu.:0.9412   3rd Qu.:0.008677
 Max.   :0.024946   Max.   :1.0000   Max.   :0.030152
      lift             count
 Min.   :  8.036   Min.   : 93.0
 1st Qu.: 25.003   1st Qu.:101.0
 Median : 57.604   Median :121.0
 Mean   : 58.506   Mean   :130.1
 3rd Qu.: 91.274   3rd Qu.:147.0
 Max.   :126.817   Max.   :460.0

mining info:
```

data <chr>	ntransactions <int>	support <dbl>	confidence <dbl>
.	18440	0.005	0.8

1 row | 1-5 of 5 columns

Hide

```
rule1 %>% head(n=5) %>% inspect
```

	lhs <chr>		rhs <chr>	support <dbl>	confidence <dbl>	coverage <dbl>	lift <dbl>	co <</dbl>
[1]	{GARAGE DESIGN}	=>	{KEY FOB}	0.005585683	1	0.005585683	49.17333	
[2]	{ELEPHANT}	=>	{BIRTHDAY CARD}	0.006832972	1	0.006832972	76.19835	
[3]	{COAL BLACK}	=>	{FEATHER PEN}	0.005965293	1	0.005965293	77.15481	
[4]	{LIGHT PINK}	=>	{FEATHER PEN}	0.005694143	1	0.005694143	77.15481	
[5]	{RETRO SPOT}	=>	{BIRTHDAY CARD}	0.006832972	1	0.006832972	76.19835	

5 rows

Hide

```
rule1 %>% tail(n=5) %>% inspect()
```

```
    lhs                                     rhs                                       support co
nfidence    coverage     lift count
[1] {SET OF 3 WOODEN HEART DECORATIONS,
     SET OF 3 WOODEN SLEIGH DECORATIONS} => {SET OF 3 WOODEN STOCKING DECORATION} 0.006561822
0.8013245 0.008188720 53.92855   121
[2] {REGENCY MILK JUG PINK,
     REGENCY SUGAR BOWL GREEN}           => {REGENCY TEAPOT ROSES}                0.008947939
0.8009709 0.011171367 41.84108   165
[3] {PINK POLKADOT BOWL,
     RED RETROSPOT BOWL}                 => {BLUE POLKADOT BOWL}                  0.005422993
0.8000000 0.006778742 66.15247   100
[4] {SET OF 12 FAIRY CAKE BAKING CASES,
     SET OF 6 SNACK LOAF BAKING CASES,
     SET OF 6 TEA TIME BAKING CASES}     => {SET OF 12 MINI LOAF BAKING CASES}    0.005856833
0.8000000 0.007321041 41.09192   108
[5] {LUNCH BAG APPLE DESIGN,
     LUNCH BAG PINK POLKADOT,
     LUNCH BAG WOODLAND}                 => {LUNCH BAG RED RETROSPOT}             0.006290672
0.8000000 0.007863341 11.45342   116
```

Hide

```
rule1 <- rule1 %>% sort(by ="lift")
```

Hide

```
rule1 %>% head(n=5) %>% inspect()
```

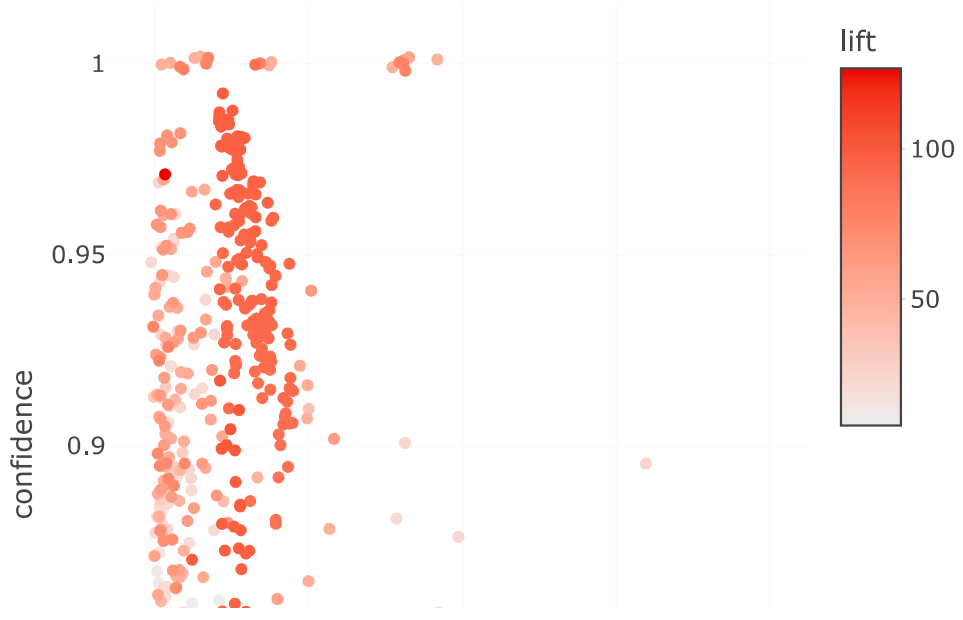
```
    lhs                             rhs                            support confidence    covera
ge     lift count
[1] {DOLLY GIRL CHILDRENS CUP,
     SPACEBOY CHILDRENS BOWL}    => {DOLLY GIRL CHILDRENS BOWL} 0.005206074  0.9696970 0.0053687
64 126.8171    96
[2] {DOLLY GIRL CHILDRENS BOWL}  => {DOLLY GIRL CHILDRENS CUP}  0.006344902  0.8297872 0.0076464
21 106.2589   117
[3] {DOLLY GIRL CHILDRENS CUP}   => {DOLLY GIRL CHILDRENS BOWL} 0.006344902  0.8125000 0.0078091
11 106.2589   117
[4] {DOLLY GIRL CHILDRENS BOWL,
     SPACEBOY CHILDRENS BOWL}    => {DOLLY GIRL CHILDRENS CUP}  0.005206074  0.8135593 0.0063991
32 104.1808    96
[5] {HERB MARKER BASIL,
     HERB MARKER MINT,
     HERB MARKER PARSLEY,
     HERB MARKER ROSEMARY,
     HERB MARKER THYME}          => {HERB MARKER CHIVES}        0.007158351  0.9166667 0.0078091
11 101.8273   132
```

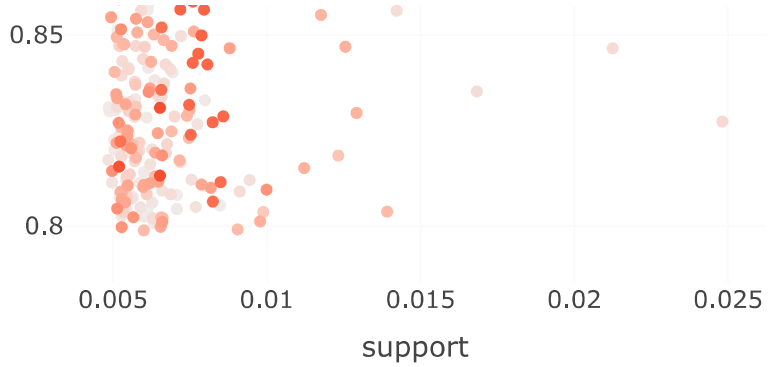
#Plotting

Hide

```
plot(rule1,engine= "htmlwidget")
```

```
To reduce overplotting, jitter is added! Use jitter = 0 to prevent jitter.
Registered S3 method overwritten by 'data.table':
  method           from
  print.data.table
Registered S3 method overwritten by 'htmlwidgets':
  method           from
  print.htmlwidget tools:rstudio
```

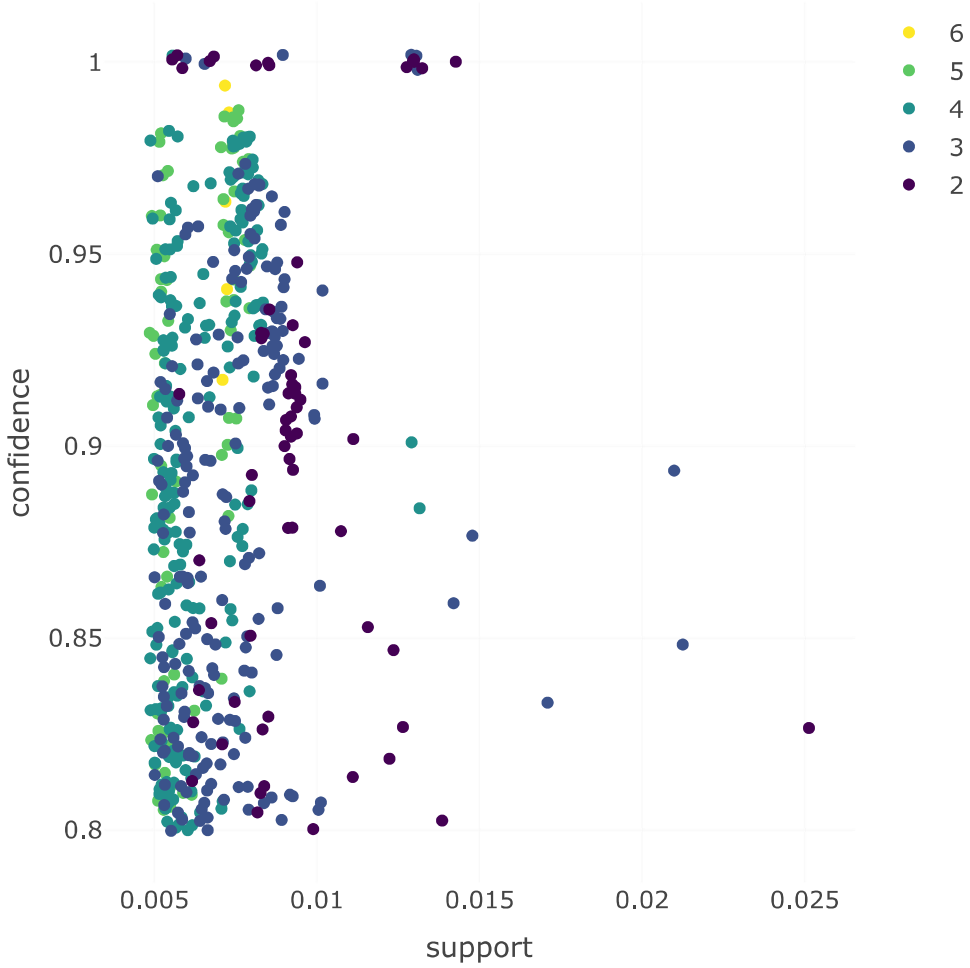




Hide

```
plot(rule1, method = "two-key", engine="htmlwidget")
```

```
To reduce overplotting, jitter is added! Use jitter = 0 to prevent jitter.
```

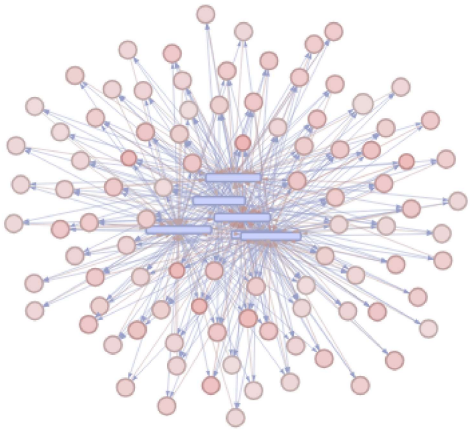


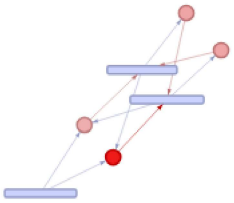
Hide

```
plot(rule1, method="graph",engine="htmlwidget")
```

```
Warning: Too many rules supplied. Only plotting the best 100 using 'lift' (change control parame
ter max if needed).
```

Select by id





	lhs		rhs	support	confidence	coverage
	<chr>		<chr>	<dbl>	<dbl>	<dbl>
[1]	{SET 3 RETROSPOT TEA}	=>	{SUGAR}	0.01306941	1	0.01306941
[2]	{SUGAR}	=>	{SET 3 RETROSPOT TEA}	0.01306941	1	0.01306941
[3]	{SET 3 RETROSPOT TEA}	=>	{COFFEE}	0.01306941	1	0.01306941
[4]	{SUGAR}	=>	{COFFEE}	0.01306941	1	0.01306941
[5]	{BACK DOOR}	=>	{KEY FOB}	0.01268980	1	0.01268980

5 rows

Hide

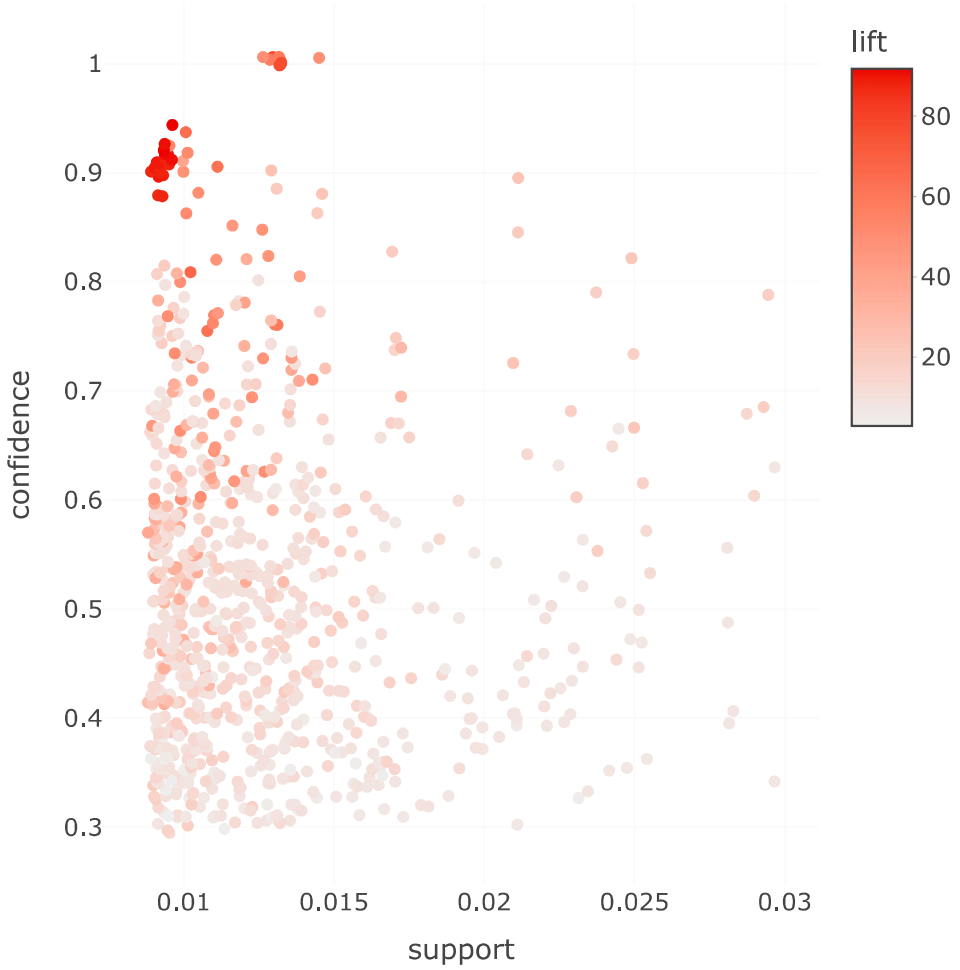
```
rule2 %>% tail(n=5) %>% inspect
```

```
    lhs                                    rhs                                    support conf
idence   coverage      lift count
[1] {HOME BUILDING BLOCK WORD}          => {WHITE HANGING HEART T-LIGHT HOLDER} 0.011334056  0.3
024602 0.03747289  2.829714   209
[2] {LUNCH BAG RED RETROSPOT}           => {LUNCH BAG APPLE DESIGN}             0.021095445  0.3
020186 0.06984816  6.430974   389
[3] {CHARLOTTE BAG SUKI DESIGN}         => {CHARLOTTE BAG APPLES DESIGN}        0.009544469  0.3
008547 0.03172451 13.053555   176
[4] {IVORY KITCHEN SCALES}              => {MINT KITCHEN SCALES}                0.010086768  0.3
000000 0.03362256 18.197368   186
[5] {JUMBO SHOPPER VINTAGE RED PAISLEY} => {JUMBO  BAG BAROQUE BLACK WHITE}     0.012852495  0.3
000000 0.04284165  8.523883   237
```

Hide

```
plot(rule2,engine= "htmlwidget")
```

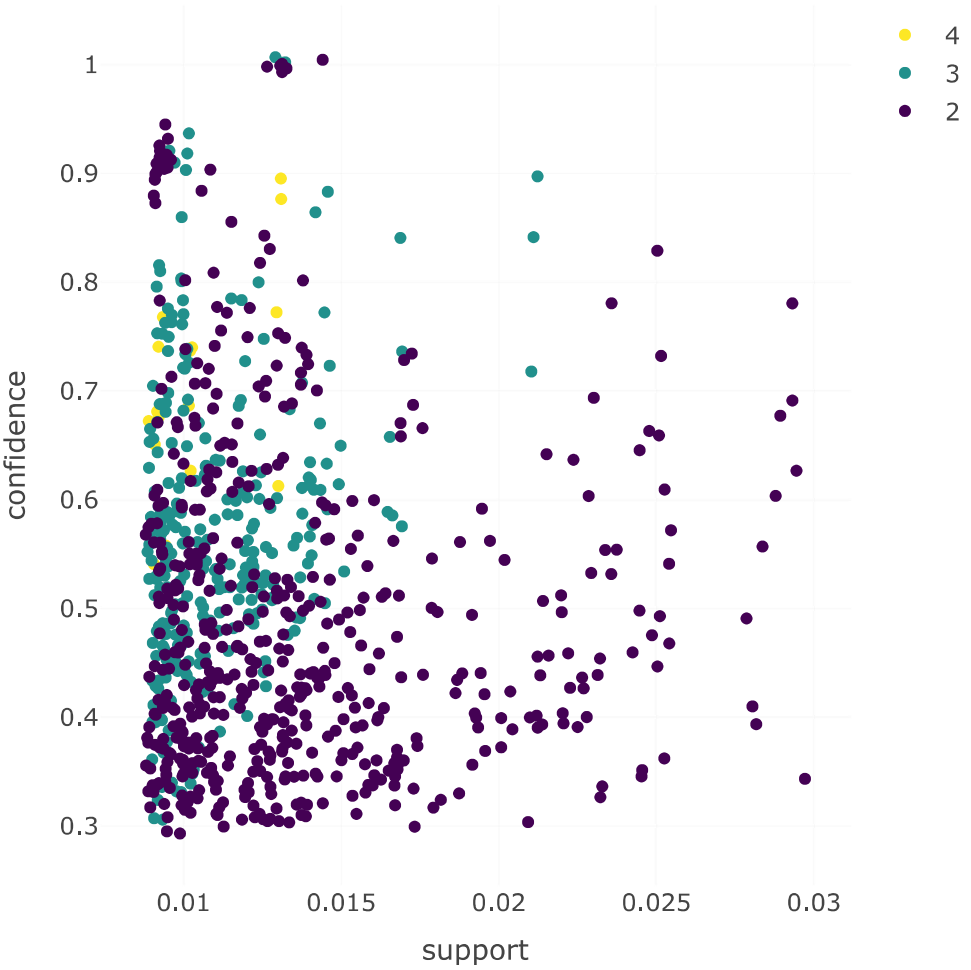
```
To reduce overplotting, jitter is added! Use jitter = 0 to prevent jitter.
```



Hide

```
plot(rule2,method = "two-key",engine= "htmlwidget")
```

```
To reduce overplotting, jitter is added! Use jitter = 0 to prevent jitter.
```

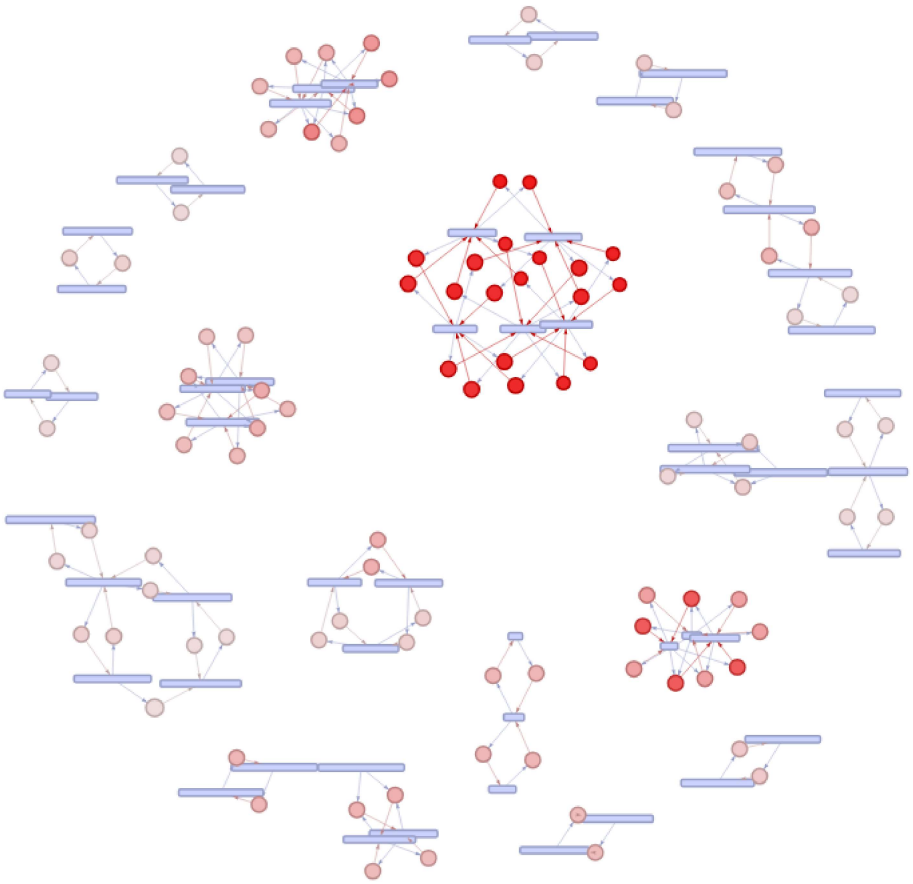


Hide

```
plot(rule2, method="graph",engine= "htmlwidget")
```

```
Warning: Too many rules supplied. Only plotting the best 100 using ‘lift’ (change control parame
ter max if needed).
```

Select by id



Hide

```
rule3 <- market_basket %>%
  apriori(parameter = list(supp = 0.02, conf = 0.5)) %>%
  sort(by = 'support')
```

```
Apriori

Parameter specification:
```

confidence <dbl>	minval <dbl>	s… <dbl>	ar… <chr>	aval <lgl>	originalSupport <lgl>	maxtime <dbl>	support <dbl>	minlen <int>
0.5	0.1	1	none	FALSE	TRUE	5	0.02	1

1 row | 1-10 of 12 columns

```
Algorithmic control:
```

filter <dbl>	tree <lgl>	heap <lgl>	memopt <lgl>	load <lgl>	sort <int>	verbose <lgl>
0.1	TRUE	TRUE	FALSE	TRUE	2	TRUE

1 row

```
Absolute minimum support count: 368

set item appearances ...[0 item(s)] done [0.00s].
set transactions ...[22346 item(s), 18440 transaction(s)] done [0.19s].
sorting and recoding items ... [208 item(s)] done [0.01s].
creating transaction tree ... done [0.01s].
checking subsets of size 1 2 3 done [0.01s].
writing ... [29 rule(s)] done [0.00s].
creating S4 object  ... done [0.00s].
```

Hide

```
summary(rule3)
```

```
set of 29 rules

rule length distribution (lhs + rhs):sizes
 2  3
26  3

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  2.000   2.000   2.000   2.103   2.000   3.000

summary of quality measures:
    support          confidence        coverage
 Min.   :0.02028   Min.   :0.5025   Min.   :0.02364
 1st Qu.:0.02251   1st Qu.:0.5594   1st Qu.:0.03444
 Median :0.02364   Median :0.6355   Median :0.03812
 Mean   :0.02442   Mean   :0.6467   Mean   :0.03863
 3rd Qu.:0.02538   3rd Qu.:0.6909   3rd Qu.:0.04284
 Max.   :0.02956   Max.   :0.8945   Max.   :0.05049
      lift            count
 Min.   : 5.799   Min.   :374.0
 1st Qu.: 7.552   1st Qu.:415.0
 Median :14.151   Median :436.0
 Mean   :13.995   Mean   :450.3
 3rd Qu.:18.438   3rd Qu.:468.0
 Max.   :23.909   Max.   :545.0

mining info:
```

data	ntransactions	support	confidence
<chr>	<int>	<dbl>	<dbl>
.	18440	0.02	0.5

1 row | 1-5 of 5 columns

Hide

```
rule3 %>% head(n=5) %>% inspect
```

```
    lhs                                 rhs                                   support confidence
coverage     lift count
[1] {JUMBO BAG PINK POLKADOT}         => {JUMBO BAG RED RETROSPOT}         0.02955531  0.6264368
0.04718004  7.22872   545
[2] {GREEN REGENCY TEACUP AND SAUCER} => {ROSES REGENCY TEACUP AND SAUCER} 0.02933839  0.7829233
0.03747289 18.43819   541
[3] {ROSES REGENCY TEACUP AND SAUCER} => {GREEN REGENCY TEACUP AND SAUCER} 0.02933839  0.6909323
0.04246204 18.43819   541
[4] {ALARM CLOCK BAKELIKE GREEN}      => {ALARM CLOCK BAKELIKE RED}        0.02879610  0.6730038
0.04278742 14.15073   531
[5] {ALARM CLOCK BAKELIKE RED}        => {ALARM CLOCK BAKELIKE GREEN}      0.02879610  0.6054732
0.04755965 14.15073   531
```

Hide

```
rule3 %>% head(n=5) %>% inspect
```

```
    lhs                                 rhs                                   support confidence
coverage     lift count
[1] {JUMBO BAG PINK POLKADOT}         => {JUMBO BAG RED RETROSPOT}         0.02955531  0.6264368
0.04718004  7.22872   545
[2] {GREEN REGENCY TEACUP AND SAUCER} => {ROSES REGENCY TEACUP AND SAUCER} 0.02933839  0.7829233
0.03747289 18.43819   541
[3] {ROSES REGENCY TEACUP AND SAUCER} => {GREEN REGENCY TEACUP AND SAUCER} 0.02933839  0.6909323
0.04246204 18.43819   541
[4] {ALARM CLOCK BAKELIKE GREEN}      => {ALARM CLOCK BAKELIKE RED}        0.02879610  0.6730038
0.04278742 14.15073   531
[5] {ALARM CLOCK BAKELIKE RED}        => {ALARM CLOCK BAKELIKE GREEN}      0.02879610  0.6054732
0.04755965 14.15073   531
```

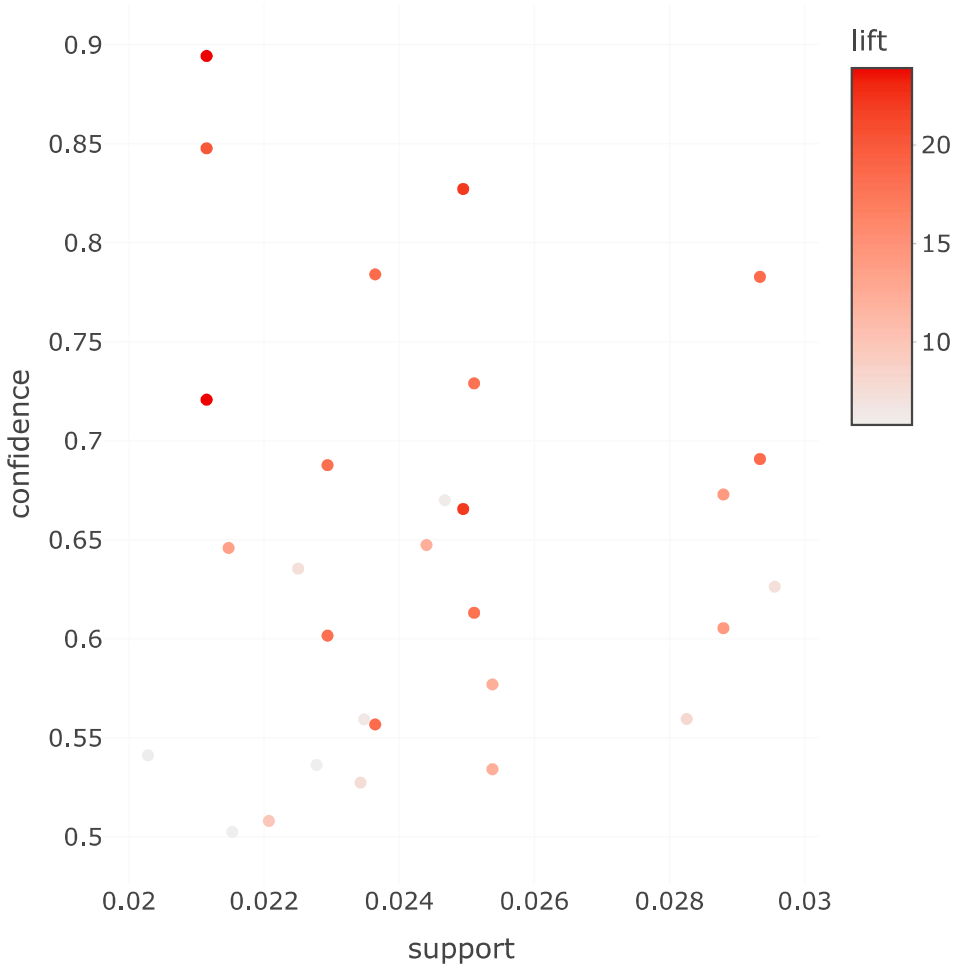
Hide

```
rule3 %>% tail(n=5) %>% inspect
```

```
    lhs                                   rhs                                    support confidenc
e   coverage     lift count
[1] {ALARM CLOCK BAKELIKE PINK}        => {ALARM CLOCK BAKELIKE RED}         0.02147505  0.646003
3 0.03324295 13.58301   396
[2] {GREEN REGENCY TEACUP AND SAUCER,
     PINK REGENCY TEACUP AND SAUCER}   => {ROSES REGENCY TEACUP AND SAUCER} 0.02114967  0.847826
1 0.02494577 19.96668   390
[3] {PINK REGENCY TEACUP AND SAUCER,
     ROSES REGENCY TEACUP AND SAUCER}  => {GREEN REGENCY TEACUP AND SAUCER} 0.02114967  0.894495
4 0.02364425 23.87047   390
[4] {GREEN REGENCY TEACUP AND SAUCER,
     ROSES REGENCY TEACUP AND SAUCER}  => {PINK REGENCY TEACUP AND SAUCER}  0.02114967  0.720887
2 0.02933839 23.90856   390
[5] {GREEN REGENCY TEACUP AND SAUCER}  => {REGENCY CAKESTAND 3 TIER}         0.02028200  0.541244
6 0.03747289  5.86057   374
```

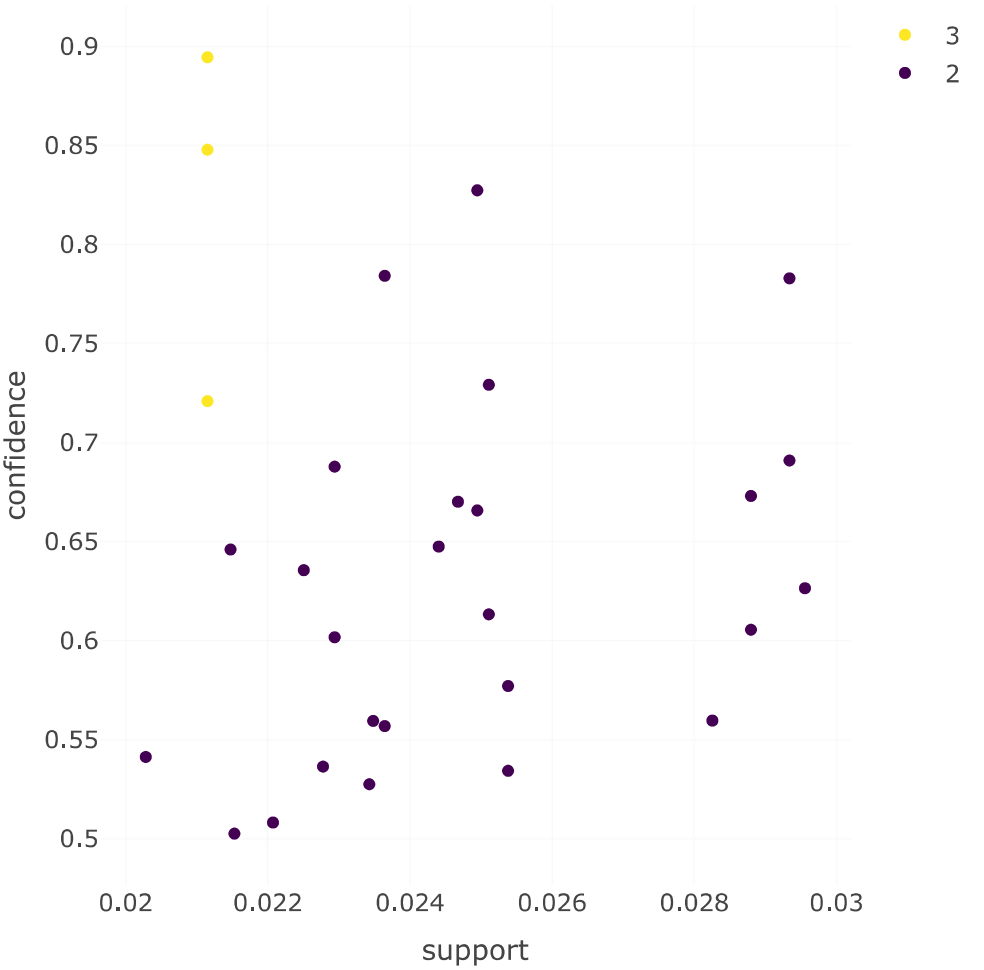
Hide

```
plot(rule3,engine= "htmlwidget")
```



Hide

```
plot(rule3,method="two-key",engine= "htmlwidget")
```



Hide

```
plot(rule3,method="graph",engine= "htmlwidget")
```

Select by id