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<b>Program</b>	Computer Engineering
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<b>Division</b>	A
<b>Subject</b>	DMPM – L [BTECCE 21608]
<b>Assignment No</b>	<b>6</b>

## DMPM Lab Assignment:- 6\_Decision Tree

### Code:-

```
library(arules)

library(arulesViz)

library(RColorBrewer)

# Load data

data <- read.csv(choose.files())

View(data)

# (a) Minimum support = 1% and confidence = 30%

rules_a <- apriori(data, parameter = list(supp = 0.01, conf = 0.3))

# (b) Minimum support = 2% and confidence = 40%

rules_b <- apriori(data, parameter = list(supp = 0.02, conf = 0.4))

# (c) Minimum support = 3% and confidence = 50%

rules_c <- apriori(data, parameter = list(supp = 0.03, conf = 0.5))

# Display first 5 rules for each case

cat("First 5 rules for case (a):\n")

inspect(rules_a[1:5])

cat("\nFirst 5 rules for case (b):\n")

inspect(rules_b[1:5])

cat("\nFirst 5 rules for case (c):\n")

inspect(rules_c[1:5])

# Sort all rules based on "lift" and display first 5 rules

sorted_rules_a <- sort(rules_a, by = "lift")

sorted_rules_b <- sort(rules_b, by = "lift")

sorted_rules_c <- sort(rules_c, by = "lift")

cat("\nFirst 5 rules sorted by lift for case (a):\n")

inspect(sorted_rules_a[1:5])

cat("\nFirst 5 rules sorted by lift for case (b):\n")

inspect(sorted_rules_b[1:5])
```

```

cat("\nFirst 5 rules sorted by lift for case (c):\n")

inspect(sorted_rules_c[1:5])

# Interpretation of confidence value for two rules from each case

cat("\nInterpretation of confidence value for two rules from case (a):\n")

inspect(rules_a[1:2])

cat("\nInterpretation of confidence value for two rules from case (b):\n")

inspect(rules_b[1:2])

cat("\nInterpretation of confidence value for two rules from case (c):\n")

inspect(rules_c[1:2])

# Plot the rules

plot(rules_a, method = "graph", control = list(type = "items"))

plot(rules_b, method = "graph", control = list(type = "items"))

plot(rules_c, method = "graph", control = list(type = "items"))

# Plot the rules using group method

plot(rules_a, method = "grouped")

plot(rules_b, method = "grouped")

plot(rules_c, method = "grouped")

# First 5 rules with minimum length 5 for case (a):

cat("\nFirst 5 rules with minimum length 5 for case (a):\n")

long_rules_a <- subset(rules_a, subset = length(lhs) >= 5 & length(rhs) >= 5)

inspect(long_rules_a[1:5])

# First 5 rules with minimum length 5 for case (b):

cat("\nFirst 5 rules with minimum length 5 for case (b):\n")

long_rules_b <- subset(rules_b, subset = length(lhs) >= 5 & length(rhs) >= 5)

inspect(long_rules_b[1:5])

# First 5 rules with minimum length 5 for case (c):

cat("\nFirst 5 rules with minimum length 5 for case (c):\n")

long_rules_c <- subset(rules_c, subset = length(lhs) >= 5 & length(rhs) >= 5)

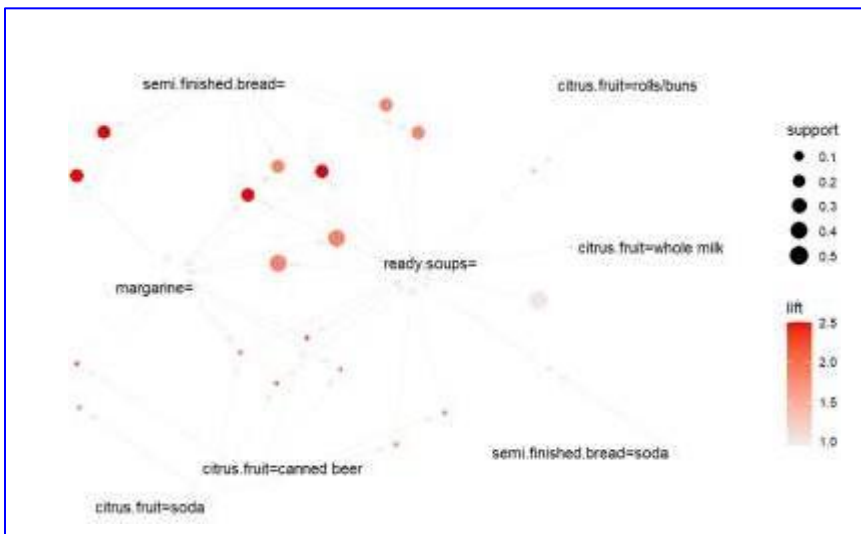
inspect(long_rules_c[1:5])

```

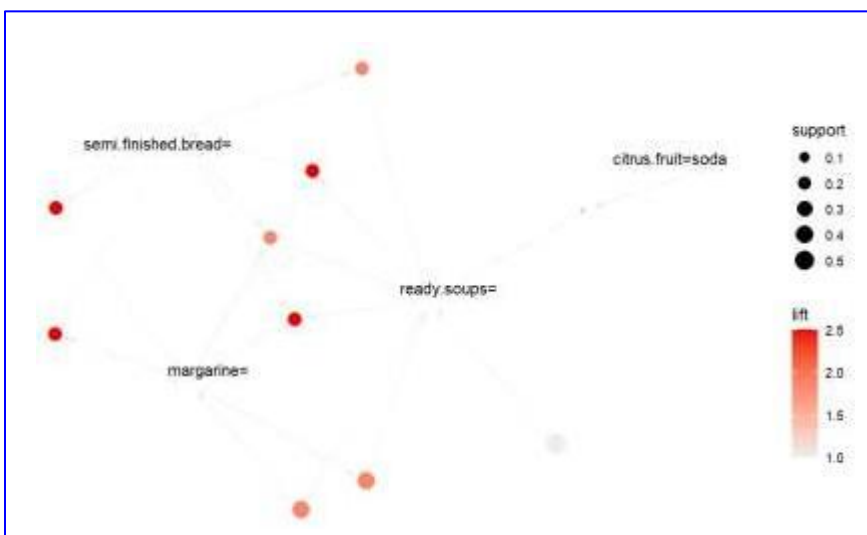
plot(rules\_a)



plot(rules-b)



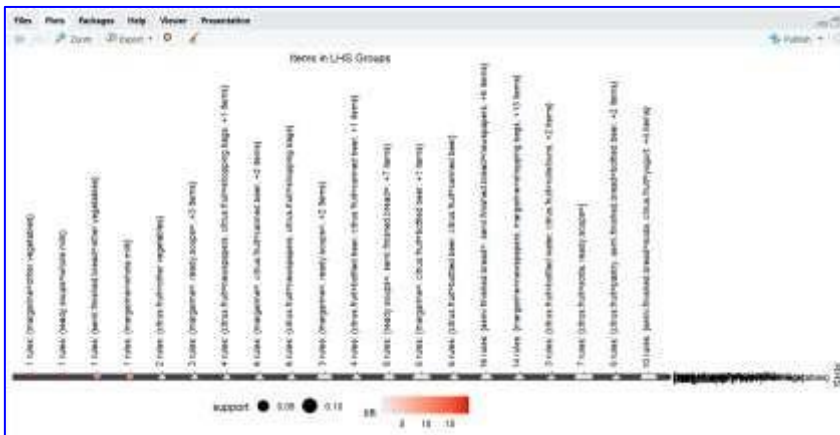
plot(rules\_c)



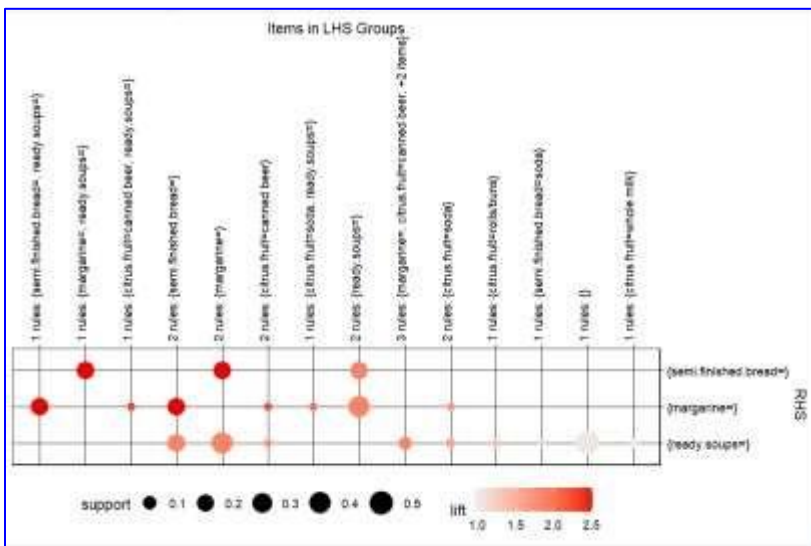


## # Plot the rules using group method

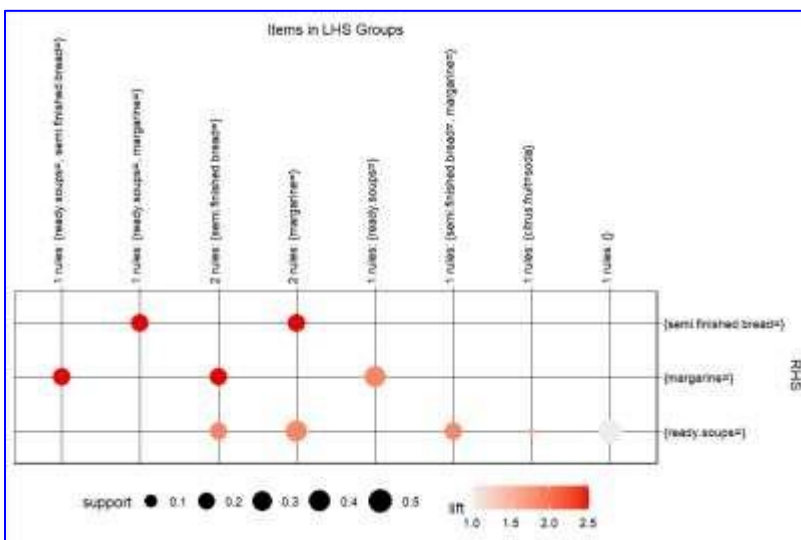
A)



B)



C)





```
# First 5 rules with minimum length 5 for case (a):> cat("\nFirst 5 rules with minimum length 5 for case (a):\n")
First 5 rules with minimum length 5 for case (a):> long_rules_a <- subset(rules_a, subset = length(lhs) >= 5 & length(rhs) >= 5)> inspect
(long_rules_a[1:5])      lhs      rhs      support      confidence
[1] {} => {margarine=} 0.39980386 0.3998039
[2] {} => {ready.soups=} 0.53723439 0.5372344
[3] {semi.finished.bread=newspapers} => {margarine=} 0.01157241 0.8894472
[4] {semi.finished.bread=newspapers} => {ready.soups=} 0.01294541 0.9949749
[5] {semi.finished.bread=bottled beer} => {ready.soups=} 0.01026479 0.7733990
coverage lift count
[1] 1.00000000 1.000000 6115
[2] 1.00000000 1.000000 8217
[3] 0.01301079 2.224709 177
[4] 0.01301079 1.852031 198
[5] 0.01327231 1.439593 157 > # First 5 rules with minimum length 5 for case (b):> cat("\nFirst 5 rules with minimum length 5 for case
(b):\n")
First 5 rules with minimum length 5 for case (b):> long_rules_b <- subset(rules_b, subset = length(lhs) >= 5 & length(rhs) >= 5)> inspect
(long_rules_b[1:5])      lhs      rhs      support      confidence      coverage
[1] {} => {ready.soups=} 0.53723439 0.5372344 1.00000000
[2] {citrus.fruit=canned beer} => {margarine=} 0.02262177 0.8917526 0.02536777
[3] {citrus.fruit=canned beer} => {ready.soups=} 0.02451782 0.9664948 0.02536777
[4] {semi.finished.bread=soda} => {ready.soups=} 0.02000654 0.6270492 0.03190585
[5] {citrus.fruit=soda} => {margarine=} 0.02451782 0.6818182 0.03595946
lift count
[1] 1.0000000 8217
[2] 2.230475 346
[3] 1.799019 375
[4] 1.167180 306
[5] 1.705382 375 > # First 5 rules with minimum length 5 for case (c):> cat("\nFirst 5 rules with minimum length 5 for case (c):\n")
First 5 rules with minimum length 5 for case (c):> long_rules_c <- subset(rules_c, subset = length(lhs) >= 5 & length(rhs) >= 5)> inspect
(long_rules_c[1:5])      lhs      rhs      support      confidence
[1] {} => {ready.soups=} 0.53723439 0.5372344
[2] {citrus.fruit=soda} => {ready.soups=} 0.03059823 0.8509091
[3] {semi.finished.bread=} => {margarine=} 0.22785224 1.0000000
[4] {margarine=} => {semi.finished.bread=} 0.22785224 0.5699101
[5] {semi.finished.bread=} => {ready.soups=} 0.22785224 1.0000000
coverage lift count
[1] 1.00000000 1.000000 8217
[2] 0.03595946 1.583869 468
[3] 0.22785224 2.501226 3485
[4] 0.39980386 2.501226 3485
[5] 0.22785224 1.861385 3485
```

	citrus.fruit	semi.finished.bread	margarine	ready.soups
1	tropical fruit	yogurt	coffee	
2	whole milk			
3	pip fruit	yogurt	cream cheese	meat spreads
4	other vegetables	whole milk	condensed milk	long life bakery product
5	whole milk	butter	yogurt	rice
6	abrasive cleaner			
7	rolls/buns			
8	other vegetables	UHT-milk	rolls/buns	bottled beer
9	liquor (appetizer)			
10	potted plants			
11	whole milk	cereals		
12	tropical fruit	other vegetables	white bread	bottled water
13	chocolate			
14	citrus fruit	tropical fruit	whole milk	butter
15	curd	yogurt	flour	bottled water
16	dishes			
17	beef			
18	frankfurter	rolls/buns	soda	
19	chicken	tropical fruit		
20	butter	sugar	fruit/vegetable juice	newspapers

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