**BOOKS DATASETS**

**> book <- read.csv(file.choose())**

**> View(book)**

**> summary(book)**

ChildBks YouthBks CookBks DoItYBks RefBks ArtBks

Min. :0.000 Min. :0.0000 Min. :0.000 Min. :0.000 Min. :0.0000 Min. :0.000

1st Qu.:0.000 1st Qu.:0.0000 1st Qu.:0.000 1st Qu.:0.000 1st Qu.:0.0000 1st Qu.:0.000

Median :0.000 Median :0.0000 Median :0.000 Median :0.000 Median :0.0000 Median :0.000

Mean :0.423 Mean :0.2475 Mean :0.431 Mean :0.282 Mean :0.2145 Mean :0.241

3rd Qu.:1.000 3rd Qu.:0.0000 3rd Qu.:1.000 3rd Qu.:1.000 3rd Qu.:0.0000 3rd Qu.:0.000

Max. :1.000 Max. :1.0000 Max. :1.000 Max. :1.000 Max. :1.0000 Max. :1.000

GeogBks ItalCook ItalAtlas ItalArt Florence

Min. :0.000 Min. :0.0000 Min. :0.000 Min. :0.0000 Min. :0.0000

1st Qu.:0.000 1st Qu.:0.0000 1st Qu.:0.000 1st Qu.:0.0000 1st Qu.:0.0000

Median :0.000 Median :0.0000 Median :0.000 Median :0.0000 Median :0.0000

Mean :0.276 Mean :0.1135 Mean :0.037 Mean :0.0485 Mean :0.1085

3rd Qu.:1.000 3rd Qu.:0.0000 3rd Qu.:0.000 3rd Qu.:0.0000 3rd Qu.:0.0000

Max. :1.000 Max. :1.0000 Max. :1.000 Max. :1.0000 Max. :1.0000

> describe(book)

vars n mean sd median trimmed mad min max range skew kurtosis se

ChildBks 1 2000 0.42 0.49 0 0.40 0 0 1 1 0.31 -1.90 0.01

YouthBks 2 2000 0.25 0.43 0 0.18 0 0 1 1 1.17 -0.63 0.01

CookBks 3 2000 0.43 0.50 0 0.41 0 0 1 1 0.28 -1.92 0.01

DoItYBks 4 2000 0.28 0.45 0 0.23 0 0 1 1 0.97 -1.06 0.01

RefBks 5 2000 0.21 0.41 0 0.14 0 0 1 1 1.39 -0.07 0.01

ArtBks 6 2000 0.24 0.43 0 0.18 0 0 1 1 1.21 -0.54 0.01

GeogBks 7 2000 0.28 0.45 0 0.22 0 0 1 1 1.00 -1.00 0.01

ItalCook 8 2000 0.11 0.32 0 0.02 0 0 1 1 2.44 3.93 0.01

ItalAtlas 9 2000 0.04 0.19 0 0.00 0 0 1 1 4.90 22.04 0.00

ItalArt 10 2000 0.05 0.21 0 0.00 0 0 1 1 4.20 15.65 0.00

Florence 11 2000 0.11 0.31 0 0.01 0 0 1 1 2.52 4.33 0.01

> ggpairs(book)

> corrplot(cor(book),method = "square",type = "lower")

> sum(is.na(book))

[1] 0

> # applying apriorimalgorithm

> # apriori algorithm with support =0.02 , confi =0.5 & minlen = 3

> rules\_book <- apriori(as.matrix(book),parameter = list(support =0.02,confidence=0.5,minlen=3))

Apriori

Parameter specification:

confidence minval smax arem aval originalSupport maxtime support minlen maxlen target ext

0.5 0.1 1 none FALSE TRUE 5 0.02 3 10 rules TRUE

Algorithmic control:

filter tree heap memopt load sort verbose

0.1 TRUE TRUE FALSE TRUE 2 TRUE

Absolute minimum support count: 40

set item appearances ...[0 item(s)] done [0.00s].

set transactions ...[11 item(s), 2000 transaction(s)] done [0.00s].

sorting and recoding items ... [11 item(s)] done [0.00s].

creating transaction tree ... done [0.00s].

checking subsets of size 1 2 3 4 5 6 done [0.00s].

writing ... [641 rule(s)] done [0.00s].

creating S4 object ... done [0.00s].

> rules\_book

set of 641 rules



> inspect(head(sort(rules\_book,by="lift")))

lhs rhs support confidence coverage lift count

[1] {DoItYBks,ArtBks,ItalCook} => {ItalArt} 0.0250 0.6849315 0.0365 14.12230 50

[2] {CookBks,DoItYBks,ArtBks,ItalCook} => {ItalArt} 0.0250 0.6849315 0.0365 14.12230 50

[3] {ArtBks,GeogBks,ItalCook} => {ItalArt} 0.0240 0.6666667 0.0360 13.74570 48

[4] {CookBks,ArtBks,GeogBks,ItalCook} => {ItalArt} 0.0240 0.6666667 0.0360 13.74570 48

[5] {ArtBks,ItalCook} => {ItalArt} 0.0375 0.6637168 0.0565 13.68488 75

[6] {CookBks,ArtBks,ItalCook} => {ItalArt} 0.0375 0.6637168 0.0565 13.68488 75

> inspect(head(sort(rules\_book,by="confidence")))

lhs rhs support confidence coverage lift count

[1] {ItalCook,ItalAtlas} => {RefBks} 0.0230 1 0.0230 4.662005 46

[2] {ItalCook,ItalAtlas} => {CookBks} 0.0230 1 0.0230 2.320186 46

[3] {GeogBks,ItalAtlas} => {RefBks} 0.0205 1 0.0205 4.662005 41

[4] {ChildBks,ItalAtlas} => {RefBks} 0.0285 1 0.0285 4.662005 57

[5] {CookBks,ItalAtlas} => {RefBks} 0.0285 1 0.0285 4.662005 57

[6] {ItalCook,ItalArt} => {ArtBks} 0.0375 1 0.0375 4.149378 75

> inspect(head(sort(rules\_book,by="support")))

lhs rhs support confidence coverage lift count

[1] {ChildBks,GeogBks} => {CookBks} 0.1495 0.7666667 0.1950 1.778809 299

[2] {CookBks,GeogBks} => {ChildBks} 0.1495 0.7766234 0.1925 1.835989 299

[3] {ChildBks,CookBks} => {GeogBks} 0.1495 0.5839844 0.2560 2.115885 299

[4] {ChildBks,DoItYBks} => {CookBks} 0.1460 0.7934783 0.1840 1.841017 292

[5] {CookBks,DoItYBks} => {ChildBks} 0.1460 0.7786667 0.1875 1.840820 292

[6] {ChildBks,CookBks} => {DoItYBks} 0.1460 0.5703125 0.2560 2.022385 292

> inspect(head(sort(rules\_book,by=c("count","lift")))) #maximum count = 299

lhs rhs support confidence coverage lift count

[1] {ChildBks,CookBks} => {GeogBks} 0.1495 0.5839844 0.2560 2.115885 299

[2] {CookBks,GeogBks} => {ChildBks} 0.1495 0.7766234 0.1925 1.835989 299

[3] {ChildBks,GeogBks} => {CookBks} 0.1495 0.7666667 0.1950 1.778809 299

[4] {ChildBks,CookBks} => {DoItYBks} 0.1460 0.5703125 0.2560 2.022385 292

[5] {ChildBks,DoItYBks} => {CookBks} 0.1460 0.7934783 0.1840 1.841017 292

[6] {CookBks,DoItYBks} => {ChildBks} 0.1460 0.7786667 0.1875 1.840820 292

> # visualisation

> colfunction <- colorRampPalette(c("red","blue","yellow"))

>



> plot(rules\_book,method = "paracoord")

>



> plot(head(sort(rules\_book,by="lift"),n=10),method = "graph")

> plot(rules\_book,method = "matrix")

Itemsets in Antecedent (LHS)

[1] "{CookBks,ArtBks,GeogBks,ItalArt}" "{ChildBks,CookBks,RefBks,ItalAtlas}"

[3] "{CookBks,GeogBks,ItalArt}" "{ChildBks,CookBks,ItalAtlas}"

[5] "{CookBks,DoItYBks,ArtBks,ItalCook}" "{ChildBks,CookBks,ArtBks,ItalArt}"

[7] "{DoItYBks,ArtBks,ItalCook}" "{CookBks,ArtBks,GeogBks,ItalCook}"

[9] "{ChildBks,CookBks,ItalArt}" "{CookBks,DoItYBks,ArtBks,ItalArt}"

[11] "{ChildBks,CookBks,ArtBks,ItalCook}" "{CookBks,DoItYBks,ItalArt}"

[13] "{GeogBks,ItalAtlas}" "{ChildBks,CookBks,ItalCook,ItalAtlas}"

[15] "{CookBks,ItalAtlas}" "{CookBks,RefBks,ItalAtlas}"

[17] "{ArtBks,GeogBks,ItalCook}" "{CookBks,ArtBks,ItalCook}"

[19] "{ChildBks,ArtBks,ItalCook}" "{ChildBks,ItalAtlas}"

[21] "{RefBks,ItalArt}" "{YouthBks,ItalArt}"

[23] "{ChildBks,GeogBks,ItalArt}" "{CookBks,DoItYBks,ItalCook,ItalArt}"

[25] "{CookBks,GeogBks,ItalCook,ItalArt}" "{ChildBks,CookBks,ItalCook,ItalArt}"

[27] "{ChildBks,CookBks,DoItYBks,ItalArt}" "{ArtBks,ItalCook}"

[29] "{ChildBks,RefBks,ItalAtlas}" "{DoItYBks,ItalArt}"

[31] "{GeogBks,ItalArt}" "{DoItYBks,ArtBks,ItalArt}"

[33] "{CookBks,ItalArt}" "{ArtBks,GeogBks,ItalArt}"

[35] "{CookBks,ArtBks,ItalArt}" "{ChildBks,ItalArt}"

[37] "{ChildBks,ItalCook,ItalAtlas}" "{CookBks,ItalCook,ItalAtlas}"

[39] "{ChildBks,ArtBks,ItalArt}" "{DoItYBks,ItalCook,ItalArt}"

[41] "{GeogBks,ItalCook,ItalArt}" "{ChildBks,ItalCook,ItalArt}"

[43] "{ChildBks,DoItYBks,ItalArt}" "{ItalCook,ItalAtlas}"

[45] "{ArtBks,ItalArt}" "{ChildBks,CookBks,Florence}"

[47] "{RefBks,ItalAtlas}" "{CookBks,ItalCook,ItalArt}"

[49] "{ItalCook,ItalArt}" "{ChildBks,YouthBks,CookBks,DoItYBks,ArtBks}"

[51] "{ChildBks,GeogBks,Florence}" "{ChildBks,YouthBks,CookBks,DoItYBks,GeogBks}"

[53] "{CookBks,GeogBks,Florence}" "{ChildBks,YouthBks,CookBks,ArtBks}"

[55] "{ChildBks,CookBks,DoItYBks,GeogBks}" "{ChildBks,YouthBks,CookBks,ArtBks,GeogBks}"

[57] "{ChildBks,YouthBks,DoItYBks,GeogBks}" "{ChildBks,CookBks,DoItYBks,ArtBks,GeogBks}"

[59] "{ChildBks,YouthBks,CookBks,DoItYBks}" "{ChildBks,YouthBks,CookBks,GeogBks}"

[61] "{ChildBks,CookBks,DoItYBks,RefBks,ArtBks}" "{ChildBks,RefBks,ItalCook,ItalAtlas}"

[63] "{DoItYBks,ArtBks,ItalCook,ItalArt}" "{ArtBks,GeogBks,ItalCook,ItalArt}"

[65] "{ChildBks,ArtBks,ItalCook,ItalArt}" "{ChildBks,YouthBks,RefBks,ItalCook}"

[67] "{ChildBks,RefBks,ArtBks,ItalCook}" "{ChildBks,DoItYBks,RefBks,ItalCook}"

[69] "{ChildBks,RefBks,GeogBks,ItalCook}" "{YouthBks,ArtBks,GeogBks,ItalCook}"

[71] "{ChildBks,YouthBks,ArtBks,ItalCook}" "{ChildBks,YouthBks,DoItYBks,ItalCook}"

[73] "{ChildBks,YouthBks,GeogBks,ItalCook}" "{DoItYBks,ArtBks,GeogBks,ItalCook}"

[75] "{ChildBks,DoItYBks,ArtBks,ItalCook}" "{ChildBks,ArtBks,GeogBks,ItalCook}"

[77] "{ChildBks,DoItYBks,GeogBks,ItalCook}" "{ChildBks,CookBks,DoItYBks,RefBks,GeogBks}"

[79] "{ChildBks,YouthBks,CookBks}" "{ChildBks,CookBks,DoItYBks}"

[81] "{ChildBks,YouthBks,CookBks,RefBks,ArtBks}" "{ChildBks,DoItYBks,ItalCook}"

[83] "{ChildBks,CookBks,DoItYBks,RefBks}" "{YouthBks,CookBks,DoItYBks,GeogBks}"

[85] "{ChildBks,CookBks,DoItYBks,ItalCook}" "{ChildBks,CookBks,GeogBks}"

[87] "{YouthBks,CookBks,DoItYBks,ArtBks}" "{ChildBks,YouthBks,ArtBks}"

[89] "{ChildBks,CookBks,DoItYBks,ArtBks}" "{ChildBks,CookBks,ArtBks}"

[91] "{ChildBks,YouthBks,DoItYBks,ArtBks}" "{CookBks,DoItYBks,RefBks,GeogBks}"

[93] "{ChildBks,YouthBks,ItalCook}" "{ChildBks,CookBks,RefBks,ArtBks}"

[95] "{RefBks,ArtBks,ItalCook}" "{CookBks,Florence}"

[97] "{ChildBks,CookBks,ArtBks,GeogBks}" "{CookBks,ArtBks,Florence}"

[99] "{RefBks,GeogBks,ItalCook}" "{YouthBks,GeogBks,ItalCook}"

[101] "{ChildBks,YouthBks,CookBks,ItalCook}" "{YouthBks,CookBks,ArtBks}"

[103] "{YouthBks,RefBks,ItalCook}" "{DoItYBks,GeogBks,ItalCook}"

[105] "{YouthBks,CookBks,DoItYBks}" "{ChildBks,Florence}"

[107] "{ChildBks,YouthBks,DoItYBks}" "{ChildBks,GeogBks,ItalCook}"

[109] "{CookBks,DoItYBks,RefBks,ArtBks}" "{ChildBks,CookBks,RefBks}"

[111] "{ChildBks,YouthBks,CookBks,RefBks}" "{ChildBks,RefBks,ItalCook}"

[113] "{YouthBks,CookBks,GeogBks,ItalCook}" "{ChildBks,CookBks,GeogBks,ItalCook}"

[115] "{YouthBks,ArtBks,ItalCook}" "{DoItYBks,RefBks,ItalCook}"

[117] "{ChildBks,YouthBks,CookBks,DoItYBks,RefBks}" "{CookBks,DoItYBks,GeogBks}"

[119] "{CookBks,RefBks,ArtBks}" "{CookBks,DoItYBks,GeogBks,ItalCook}"

[121] "{ChildBks,DoItYBks,GeogBks}" "{ChildBks,CookBks,RefBks,ItalCook}"

[123] "{DoItYBks,Florence}" "{CookBks,RefBks,ArtBks,ItalCook}"

[125] "{DoItYBks,ItalCook}" "{YouthBks,CookBks,GeogBks}"

[127] "{CookBks,RefBks,GeogBks,ItalCook}" "{YouthBks,CookBks,DoItYBks,RefBks,GeogBks}"

[129] "{ArtBks,ItalCook,ItalArt}" "{YouthBks,CookBks,RefBks,ArtBks}"

[131] "{YouthBks,DoItYBks,ArtBks}" "{RefBks,ItalCook,ItalAtlas}"

[133] "{YouthBks,CookBks,RefBks,ItalCook}" "{CookBks,DoItYBks,ItalCook}"

[135] "{ChildBks,DoItYBks,ArtBks,GeogBks}" "{ChildBks,ItalCook}"

[137] "{YouthBks,CookBks,ArtBks,ItalCook}" "{ChildBks,YouthBks,GeogBks}"

[139] "{ChildBks,CookBks,RefBks,ArtBks,GeogBks}" "{YouthBks,CookBks,RefBks,GeogBks}"

[141] "{RefBks,ItalCook}" "{YouthBks,CookBks,RefBks}"

[143] "{CookBks,ArtBks,ItalCook,ItalArt}" "{ChildBks,DoItYBks,RefBks,GeogBks}"

[145] "{ChildBks,RefBks,ArtBks}" "{CookBks,DoItYBks,RefBks}"

[147] "{YouthBks,CookBks,ArtBks,GeogBks}" "{DoItYBks,RefBks,GeogBks}"

[149] "{ChildBks,YouthBks,CookBks,RefBks,GeogBks}" "{CookBks,RefBks,ArtBks,GeogBks}"

[151] "{ChildBks,YouthBks,DoItYBks,ArtBks,GeogBks}" "{ChildBks,DoItYBks,ArtBks}"

[153] "{ChildBks,CookBks,RefBks,GeogBks}" "{ChildBks,CookBks,ItalCook}"

[155] "{YouthBks,DoItYBks,GeogBks}" "{GeogBks,ItalCook}"

[157] "{YouthBks,CookBks,DoItYBks,RefBks}" "{CookBks,RefBks,ItalCook}"

[159] "{ChildBks,YouthBks,RefBks}" "{ChildBks,DoItYBks,RefBks}"

[161] "{CookBks,DoItYBks,RefBks,ItalCook}" "{YouthBks,DoItYBks,RefBks,GeogBks}"

[163] "{ChildBks,YouthBks,RefBks,ArtBks}" "{CookBks,DoItYBks,ArtBks,GeogBks}"

[165] "{ChildBks,DoItYBks,RefBks,ArtBks}" "{ChildBks,ArtBks,Florence}"

[167] "{ChildBks,DoItYBks,ArtBks,ItalArt}" "{CookBks,ArtBks,GeogBks}"

[169] "{CookBks,DoItYBks,ArtBks}" "{GeogBks,Florence}"

[171] "{ChildBks,RefBks}" "{YouthBks,DoItYBks}"

[173] "{CookBks,RefBks,GeogBks}" "{YouthBks,DoItYBks,ItalCook}"

[175] "{ChildBks,YouthBks}" "{CookBks,GeogBks,ItalCook}"

[177] "{YouthBks,DoItYBks,ArtBks,GeogBks}" "{RefBks,ArtBks}"

[179] "{ChildBks,YouthBks,DoItYBks,RefBks,GeogBks}" "{YouthBks,RefBks,ArtBks}"

[181] "{YouthBks,CookBks,RefBks,ArtBks,GeogBks}" "{YouthBks,RefBks,GeogBks}"

[183] "{ChildBks,RefBks,GeogBks}" "{DoItYBks,RefBks,ArtBks}"

[185] "{ChildBks,YouthBks,RefBks,GeogBks}" "{YouthBks,DoItYBks,RefBks}"

[187] "{CookBks,ArtBks}" "{CookBks,DoItYBks,RefBks,ArtBks,GeogBks}"

[189] "{ChildBks,YouthBks,ArtBks,GeogBks}" "{DoItYBks,ArtBks,GeogBks}"

[191] "{ChildBks,CookBks}" "{YouthBks,ItalCook}"

[193] "{CookBks,DoItYBks}" "{CookBks,RefBks,ItalCook,ItalAtlas}"

[195] "{YouthBks,RefBks}" "{YouthBks,CookBks}"

[197] "{YouthBks,ArtBks,GeogBks}" "{ChildBks,ArtBks}"

[199] "{ChildBks,ArtBks,GeogBks}" "{YouthBks,ArtBks}"

[201] "{DoItYBks,RefBks}" "{RefBks,ArtBks,GeogBks}"

[203] "{ChildBks,DoItYBks}" "{DoItYBks,GeogBks}"

[205] "{YouthBks,CookBks,DoItYBks,RefBks,ArtBks}" "{CookBks,GeogBks}"

[207] "{ChildBks,DoItYBks,RefBks,ArtBks,GeogBks}" "{ChildBks,RefBks,ArtBks,GeogBks}"

[209] "{ChildBks,YouthBks,DoItYBks,RefBks}" "{YouthBks,RefBks,ArtBks,GeogBks}"

[211] "{DoItYBks,RefBks,ArtBks,GeogBks}" "{YouthBks,GeogBks}"

[213] "{CookBks,RefBks}" "{RefBks,GeogBks}"

[215] "{YouthBks,CookBks,ItalCook}" "{YouthBks,DoItYBks,RefBks,ArtBks}"

[217] "{YouthBks,CookBks,DoItYBks,ArtBks,GeogBks}" "{ChildBks,GeogBks}"

[219] "{ArtBks,GeogBks}" "{DoItYBks,ArtBks}"

[221] "{RefBks,Florence}" "{CookBks,ItalCook}"

[223] "{ChildBks,YouthBks,RefBks,ArtBks,GeogBks}" "{YouthBks,CookBks,DoItYBks,ItalCook}"

[225] "{ChildBks,YouthBks,DoItYBks,RefBks,ArtBks}" "{YouthBks,Florence}"

[227] "{ArtBks,GeogBks,Florence}" "{ArtBks,Florence}"

Itemsets in Consequent (RHS)

[1] "{ChildBks}" "{CookBks}" "{DoItYBks}" "{YouthBks}" "{GeogBks}" "{ArtBks}" "{RefBks}" "{ItalCook}"

[9] "{ItalArt}"

> 

> plot(rules\_book,method = "matrix")

Itemsets in Antecedent (LHS)

[1] "{CookBks,ArtBks,GeogBks,ItalArt}" "{ChildBks,CookBks,RefBks,ItalAtlas}"

[3] "{CookBks,GeogBks,ItalArt}" "{ChildBks,CookBks,ItalAtlas}"

[5] "{CookBks,DoItYBks,ArtBks,ItalCook}" "{ChildBks,CookBks,ArtBks,ItalArt}"

[7] "{DoItYBks,ArtBks,ItalCook}" "{CookBks,ArtBks,GeogBks,ItalCook}"

[9] "{ChildBks,CookBks,ItalArt}" "{CookBks,DoItYBks,ArtBks,ItalArt}"

[11] "{ChildBks,CookBks,ArtBks,ItalCook}" "{CookBks,DoItYBks,ItalArt}"

[13] "{GeogBks,ItalAtlas}" "{ChildBks,CookBks,ItalCook,ItalAtlas}"

[15] "{CookBks,ItalAtlas}" "{CookBks,RefBks,ItalAtlas}"

[17] "{ArtBks,GeogBks,ItalCook}" "{CookBks,ArtBks,ItalCook}"

[19] "{ChildBks,ArtBks,ItalCook}" "{ChildBks,ItalAtlas}"

[21] "{RefBks,ItalArt}" "{YouthBks,ItalArt}"

[23] "{ChildBks,GeogBks,ItalArt}" "{CookBks,DoItYBks,ItalCook,ItalArt}"

[25] "{CookBks,GeogBks,ItalCook,ItalArt}" "{ChildBks,CookBks,ItalCook,ItalArt}"

[27] "{ChildBks,CookBks,DoItYBks,ItalArt}" "{ArtBks,ItalCook}"

[29] "{ChildBks,RefBks,ItalAtlas}" "{DoItYBks,ItalArt}"

[31] "{GeogBks,ItalArt}" "{DoItYBks,ArtBks,ItalArt}"

[33] "{CookBks,ItalArt}" "{ArtBks,GeogBks,ItalArt}"

[35] "{CookBks,ArtBks,ItalArt}" "{ChildBks,ItalArt}"

[37] "{ChildBks,ItalCook,ItalAtlas}" "{CookBks,ItalCook,ItalAtlas}"

[39] "{ChildBks,ArtBks,ItalArt}" "{DoItYBks,ItalCook,ItalArt}"

[41] "{GeogBks,ItalCook,ItalArt}" "{ChildBks,ItalCook,ItalArt}"

[43] "{ChildBks,DoItYBks,ItalArt}" "{ItalCook,ItalAtlas}"

[45] "{ArtBks,ItalArt}" "{ChildBks,CookBks,Florence}"

[47] "{RefBks,ItalAtlas}" "{CookBks,ItalCook,ItalArt}"

[49] "{ItalCook,ItalArt}" "{ChildBks,YouthBks,CookBks,DoItYBks,ArtBks}"

[51] "{ChildBks,GeogBks,Florence}" "{ChildBks,YouthBks,CookBks,DoItYBks,GeogBks}"

[53] "{CookBks,GeogBks,Florence}" "{ChildBks,YouthBks,CookBks,ArtBks}"

[55] "{ChildBks,CookBks,DoItYBks,GeogBks}" "{ChildBks,YouthBks,CookBks,ArtBks,GeogBks}"

[57] "{ChildBks,YouthBks,DoItYBks,GeogBks}" "{ChildBks,CookBks,DoItYBks,ArtBks,GeogBks}"

[59] "{ChildBks,YouthBks,CookBks,DoItYBks}" "{ChildBks,YouthBks,CookBks,GeogBks}"

[61] "{ChildBks,CookBks,DoItYBks,RefBks,ArtBks}" "{ChildBks,RefBks,ItalCook,ItalAtlas}"

[63] "{DoItYBks,ArtBks,ItalCook,ItalArt}" "{ArtBks,GeogBks,ItalCook,ItalArt}"

[65] "{ChildBks,ArtBks,ItalCook,ItalArt}" "{ChildBks,YouthBks,RefBks,ItalCook}"

[67] "{ChildBks,RefBks,ArtBks,ItalCook}" "{ChildBks,DoItYBks,RefBks,ItalCook}"

[69] "{ChildBks,RefBks,GeogBks,ItalCook}" "{YouthBks,ArtBks,GeogBks,ItalCook}"

[71] "{ChildBks,YouthBks,ArtBks,ItalCook}" "{ChildBks,YouthBks,DoItYBks,ItalCook}"

[73] "{ChildBks,YouthBks,GeogBks,ItalCook}" "{DoItYBks,ArtBks,GeogBks,ItalCook}"

[75] "{ChildBks,DoItYBks,ArtBks,ItalCook}" "{ChildBks,ArtBks,GeogBks,ItalCook}"

[77] "{ChildBks,DoItYBks,GeogBks,ItalCook}" "{ChildBks,CookBks,DoItYBks,RefBks,GeogBks}"

[79] "{ChildBks,YouthBks,CookBks}" "{ChildBks,CookBks,DoItYBks}"

[81] "{ChildBks,YouthBks,CookBks,RefBks,ArtBks}" "{ChildBks,DoItYBks,ItalCook}"

[83] "{ChildBks,CookBks,DoItYBks,RefBks}" "{YouthBks,CookBks,DoItYBks,GeogBks}"

[85] "{ChildBks,CookBks,DoItYBks,ItalCook}" "{ChildBks,CookBks,GeogBks}"

[87] "{YouthBks,CookBks,DoItYBks,ArtBks}" "{ChildBks,YouthBks,ArtBks}"

[89] "{ChildBks,CookBks,DoItYBks,ArtBks}" "{ChildBks,CookBks,ArtBks}"

[91] "{ChildBks,YouthBks,DoItYBks,ArtBks}" "{CookBks,DoItYBks,RefBks,GeogBks}"

[93] "{ChildBks,YouthBks,ItalCook}" "{ChildBks,CookBks,RefBks,ArtBks}"

[95] "{RefBks,ArtBks,ItalCook}" "{CookBks,Florence}"

[97] "{ChildBks,CookBks,ArtBks,GeogBks}" "{CookBks,ArtBks,Florence}"

[99] "{RefBks,GeogBks,ItalCook}" "{YouthBks,GeogBks,ItalCook}"

[101] "{ChildBks,YouthBks,CookBks,ItalCook}" "{YouthBks,CookBks,ArtBks}"

[103] "{YouthBks,RefBks,ItalCook}" "{DoItYBks,GeogBks,ItalCook}"

[105] "{YouthBks,CookBks,DoItYBks}" "{ChildBks,Florence}"

[107] "{ChildBks,YouthBks,DoItYBks}" "{ChildBks,GeogBks,ItalCook}"

[109] "{CookBks,DoItYBks,RefBks,ArtBks}" "{ChildBks,CookBks,RefBks}"

[111] "{ChildBks,YouthBks,CookBks,RefBks}" "{ChildBks,RefBks,ItalCook}"

[113] "{YouthBks,CookBks,GeogBks,ItalCook}" "{ChildBks,CookBks,GeogBks,ItalCook}"

[115] "{YouthBks,ArtBks,ItalCook}" "{DoItYBks,RefBks,ItalCook}"

[117] "{ChildBks,YouthBks,CookBks,DoItYBks,RefBks}" "{CookBks,DoItYBks,GeogBks}"

[119] "{CookBks,RefBks,ArtBks}" "{CookBks,DoItYBks,GeogBks,ItalCook}"

[121] "{ChildBks,DoItYBks,GeogBks}" "{ChildBks,CookBks,RefBks,ItalCook}"

[123] "{DoItYBks,Florence}" "{CookBks,RefBks,ArtBks,ItalCook}"

[125] "{DoItYBks,ItalCook}" "{YouthBks,CookBks,GeogBks}"

[127] "{CookBks,RefBks,GeogBks,ItalCook}" "{YouthBks,CookBks,DoItYBks,RefBks,GeogBks}"

[129] "{ArtBks,ItalCook,ItalArt}" "{YouthBks,CookBks,RefBks,ArtBks}"

[131] "{YouthBks,DoItYBks,ArtBks}" "{RefBks,ItalCook,ItalAtlas}"

[133] "{YouthBks,CookBks,RefBks,ItalCook}" "{CookBks,DoItYBks,ItalCook}"

[135] "{ChildBks,DoItYBks,ArtBks,GeogBks}" "{ChildBks,ItalCook}"

[137] "{YouthBks,CookBks,ArtBks,ItalCook}" "{ChildBks,YouthBks,GeogBks}"

[139] "{ChildBks,CookBks,RefBks,ArtBks,GeogBks}" "{YouthBks,CookBks,RefBks,GeogBks}"

[141] "{RefBks,ItalCook}" "{YouthBks,CookBks,RefBks}"

[143] "{CookBks,ArtBks,ItalCook,ItalArt}" "{ChildBks,DoItYBks,RefBks,GeogBks}"

[145] "{ChildBks,RefBks,ArtBks}" "{CookBks,DoItYBks,RefBks}"

[147] "{YouthBks,CookBks,ArtBks,GeogBks}" "{DoItYBks,RefBks,GeogBks}"

[149] "{ChildBks,YouthBks,CookBks,RefBks,GeogBks}" "{CookBks,RefBks,ArtBks,GeogBks}"

[151] "{ChildBks,YouthBks,DoItYBks,ArtBks,GeogBks}" "{ChildBks,DoItYBks,ArtBks}"

[153] "{ChildBks,CookBks,RefBks,GeogBks}" "{ChildBks,CookBks,ItalCook}"

[155] "{YouthBks,DoItYBks,GeogBks}" "{GeogBks,ItalCook}"

[157] "{YouthBks,CookBks,DoItYBks,RefBks}" "{CookBks,RefBks,ItalCook}"

[159] "{ChildBks,YouthBks,RefBks}" "{ChildBks,DoItYBks,RefBks}"

[161] "{CookBks,DoItYBks,RefBks,ItalCook}" "{YouthBks,DoItYBks,RefBks,GeogBks}"

[163] "{ChildBks,YouthBks,RefBks,ArtBks}" "{CookBks,DoItYBks,ArtBks,GeogBks}"

[165] "{ChildBks,DoItYBks,RefBks,ArtBks}" "{ChildBks,ArtBks,Florence}"

[167] "{ChildBks,DoItYBks,ArtBks,ItalArt}" "{CookBks,ArtBks,GeogBks}"

[169] "{CookBks,DoItYBks,ArtBks}" "{GeogBks,Florence}"

[171] "{ChildBks,RefBks}" "{YouthBks,DoItYBks}"

[173] "{CookBks,RefBks,GeogBks}" "{YouthBks,DoItYBks,ItalCook}"

[175] "{ChildBks,YouthBks}" "{CookBks,GeogBks,ItalCook}"

[177] "{YouthBks,DoItYBks,ArtBks,GeogBks}" "{RefBks,ArtBks}"

[179] "{ChildBks,YouthBks,DoItYBks,RefBks,GeogBks}" "{YouthBks,RefBks,ArtBks}"

[181] "{YouthBks,CookBks,RefBks,ArtBks,GeogBks}" "{YouthBks,RefBks,GeogBks}"

[183] "{ChildBks,RefBks,GeogBks}" "{DoItYBks,RefBks,ArtBks}"

[185] "{ChildBks,YouthBks,RefBks,GeogBks}" "{YouthBks,DoItYBks,RefBks}"

[187] "{CookBks,ArtBks}" "{CookBks,DoItYBks,RefBks,ArtBks,GeogBks}"

[189] "{ChildBks,YouthBks,ArtBks,GeogBks}" "{DoItYBks,ArtBks,GeogBks}"

[191] "{ChildBks,CookBks}" "{YouthBks,ItalCook}"

[193] "{CookBks,DoItYBks}" "{CookBks,RefBks,ItalCook,ItalAtlas}"

[195] "{YouthBks,RefBks}" "{YouthBks,CookBks}"

[197] "{YouthBks,ArtBks,GeogBks}" "{ChildBks,ArtBks}"

[199] "{ChildBks,ArtBks,GeogBks}" "{YouthBks,ArtBks}"

[201] "{DoItYBks,RefBks}" "{RefBks,ArtBks,GeogBks}"

[203] "{ChildBks,DoItYBks}" "{DoItYBks,GeogBks}"

[205] "{YouthBks,CookBks,DoItYBks,RefBks,ArtBks}" "{CookBks,GeogBks}"

[207] "{ChildBks,DoItYBks,RefBks,ArtBks,GeogBks}" "{ChildBks,RefBks,ArtBks,GeogBks}"

[209] "{ChildBks,YouthBks,DoItYBks,RefBks}" "{YouthBks,RefBks,ArtBks,GeogBks}"

[211] "{DoItYBks,RefBks,ArtBks,GeogBks}" "{YouthBks,GeogBks}"

[213] "{CookBks,RefBks}" "{RefBks,GeogBks}"

[215] "{YouthBks,CookBks,ItalCook}" "{YouthBks,DoItYBks,RefBks,ArtBks}"

[217] "{YouthBks,CookBks,DoItYBks,ArtBks,GeogBks}" "{ChildBks,GeogBks}"

[219] "{ArtBks,GeogBks}" "{DoItYBks,ArtBks}"

[221] "{RefBks,Florence}" "{CookBks,ItalCook}"

[223] "{ChildBks,YouthBks,RefBks,ArtBks,GeogBks}" "{YouthBks,CookBks,DoItYBks,ItalCook}"

[225] "{ChildBks,YouthBks,DoItYBks,RefBks,ArtBks}" "{YouthBks,Florence}"

[227] "{ArtBks,GeogBks,Florence}" "{ArtBks,Florence}"

Itemsets in Consequent (RHS)

[1] "{ChildBks}" "{CookBks}" "{DoItYBks}" "{YouthBks}" "{GeogBks}" "{ArtBks}" "{RefBks}" "{ItalCook}"

[9] "{ItalArt}"

>



In plot.rules(rules\_book, method = "matrix3D") :

method 'matrix3D' is deprecated use method 'matrix' with engine '3d'

>



# using differnt support and confidence

> rules\_book2 <- apriori(as.matrix(book),parameter = list(support = 0.01,confidence =0.7, minlen = 4))

Apriori

Parameter specification:

confidence minval smax arem aval originalSupport maxtime support minlen maxlen target ext

0.7 0.1 1 none FALSE TRUE 5 0.01 4 10 rules TRUE

Algorithmic control:

filter tree heap memopt load sort verbose

0.1 TRUE TRUE FALSE TRUE 2 TRUE

Absolute minimum support count: 20

set item appearances ...[0 item(s)] done [0.00s].

set transactions ...[11 item(s), 2000 transaction(s)] done [0.00s].

sorting and recoding items ... [11 item(s)] done [0.00s].

creating transaction tree ... done [0.00s].

checking subsets of size 1 2 3 4 5 6 7 done [0.00s].

writing ... [776 rule(s)] done [0.00s].

creating S4 object ... done [0.00s].

>

> rules\_book2

set of 776 rules

> inspect(head(sort(rules\_book2,by="lift")))

lhs rhs support confidence coverage lift count

[1] {RefBks,GeogBks,ItalArt} => {ItalAtlas} 0.0115 0.8518519 0.0135 23.02302 23

[2] {RefBks,ArtBks,GeogBks,ItalArt} => {ItalAtlas} 0.0115 0.8518519 0.0135 23.02302 23

[3] {ChildBks,RefBks,GeogBks,ItalArt} => {ItalAtlas} 0.0100 0.8333333 0.0120 22.52252 20

[4] {ChildBks,RefBks,ArtBks,GeogBks,ItalArt} => {ItalAtlas} 0.0100 0.8333333 0.0120 22.52252 20

[5] {RefBks,ArtBks,ItalArt} => {ItalAtlas} 0.0165 0.8250000 0.0200 22.29730 33

[6] {ChildBks,RefBks,ItalArt} => {ItalAtlas} 0.0145 0.8055556 0.0180 21.77177 29

>

> inspect(head(sort(rules\_book2,by="confidence")))

lhs rhs support confidence coverage lift count

[1] {ItalCook,ItalAtlas,ItalArt} => {RefBks} 0.0125 1 0.0125 4.662005 25

[2] {ItalCook,ItalAtlas,ItalArt} => {ArtBks} 0.0125 1 0.0125 4.149378 25

[3] {ItalCook,ItalAtlas,ItalArt} => {CookBks} 0.0125 1 0.0125 2.320186 25

[4] {RefBks,ItalAtlas,ItalArt} => {ArtBks} 0.0165 1 0.0165 4.149378 33

[5] {ArtBks,ItalAtlas,ItalArt} => {RefBks} 0.0165 1 0.0165 4.662005 33

[6] {GeogBks,ItalAtlas,ItalArt} => {RefBks} 0.0115 1 0.0115 4.662005 23

> inspect(head(sort(rules\_book2,by="support"))) # max count =178

lhs rhs support confidence coverage lift count

[1] {ChildBks,DoItYBks,GeogBks} => {CookBks} 0.0890 0.8516746 0.1045 1.976043 178

[2] {CookBks,DoItYBks,GeogBks} => {ChildBks} 0.0890 0.8202765 0.1085 1.939188 178

[3] {ChildBks,ArtBks,GeogBks} => {CookBks} 0.0835 0.8186275 0.1020 1.899368 167

[4] {CookBks,ArtBks,GeogBks} => {ChildBks} 0.0835 0.8067633 0.1035 1.907242 167

[5] {ChildBks,YouthBks,GeogBks} => {CookBks} 0.0830 0.8383838 0.0990 1.945206 166

[6] {YouthBks,CookBks,GeogBks} => {ChildBks} 0.0830 0.8556701 0.0970 2.022861 166

>

> inspect(head(sort(rules\_book2,by=c("count","lift"))))

lhs rhs support confidence coverage lift count

[1] {ChildBks,DoItYBks,GeogBks} => {CookBks} 0.0890 0.8516746 0.1045 1.976043 178

[2] {CookBks,DoItYBks,GeogBks} => {ChildBks} 0.0890 0.8202765 0.1085 1.939188 178

[3] {CookBks,ArtBks,GeogBks} => {ChildBks} 0.0835 0.8067633 0.1035 1.907242 167

[4] {ChildBks,ArtBks,GeogBks} => {CookBks} 0.0835 0.8186275 0.1020 1.899368 167

[5] {YouthBks,CookBks,GeogBks} => {ChildBks} 0.0830 0.8556701 0.0970 2.022861 166

[6] {ChildBks,YouthBks,GeogBks} => {CookBks} 0.0830 0.8383838 0.0990 1.945206 166

>

> plot(rules\_book2,method = "two-key plot",jitter=0)



> plot(head(sort(Book\_apriori),n=10), method="grouped", control=list(cex=0.2))

