

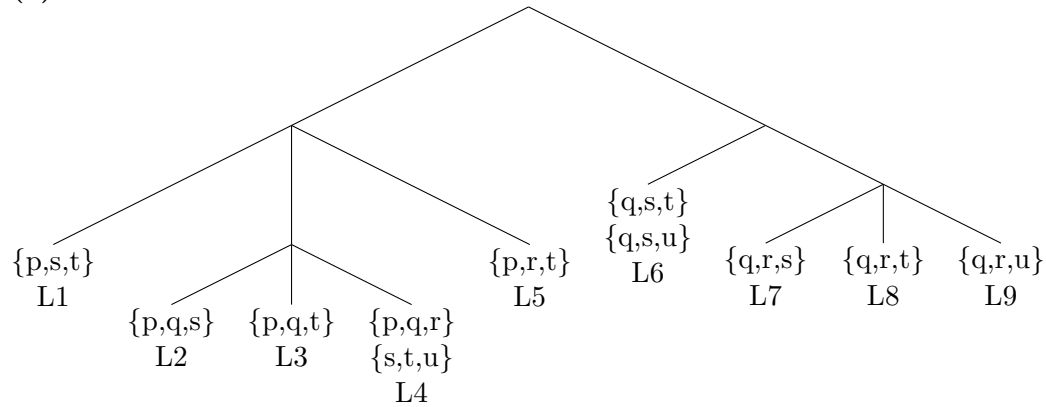
CSE881 HW6

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Problem 1

(a)



(b)

6 leaf nodes (L1,L2,L4,L5,L6,{L7,L9}) will be hashed into.

(c)

{p,q,r,s},{p,q,r,t},{p,q,s,t},{q,r,s,u},{q,r,t,u},{q,s,t,u}

(d)

{p,q,r,t},{p,q,s,t}

Problem 2

(a)

ii,iv

(b)

All of them are wrong.

(c)

iii

(d)

All of them are wrong.

(e)

i)

{A,B}

ii)

{A,B}

Problem 3

(b-1)

apriori.exe -s30 -n1 -ts votes.tab votes.out1.txt

(b-2)

33 frequent items were found.

(b-3)

republican (38.6207)

democrat (61.3793)

Democrat Party has more representatives in the data.

(b-4)

```
1 synfuels-corporation-cutback=y (34.4828)
2 religious-groups-in-schools=n (34.9425)
3 republican (38.6207)
4 crime=n (39.0805)
5 education-spending=y (39.3103)
6 adoption-of-the-budget-resolution=n (39.3103)
7 duty-free-exports=y (40)
8 physician-fee-freeze=y (40.6897)
9 aid-to-nicaraguan-contras=n (40.9195)
10 anti-satellite-test-ban=n (41.8391)
11 handicapped-infants=y (42.9885)
12 water-project-cost-sharing=n (44.1379)
13 water-project-cost-sharing=y (44.8276)
14 superfund-right-to-sue=n (46.2069)
15 mx-missile=n (47.3563)
16 mx-missile=y (47.5862)
17 el-salvador-aid=n (47.8161)
18 superfund-right-to-sue=y (48.046)
19 immigration=n (48.7356)
20 el-salvador-aid=y (48.7356)
21 immigration=y (49.6552)
22 education-spending=n (53.5632)
23 duty-free-exports=n (53.5632)
24 handicapped-infants=n (54.2529)
25 anti-satellite-test-ban=y (54.9425)
26 aid-to-nicaraguan-contras=y (55.6322)
27 physician-fee-freeze=n (56.7816)
28 crime=y (57.0115)
29 adoption-of-the-budget-resolution=y (58.1609)
30 synfuels-corporation-cutback=n (60.6897)
31 democrat (61.3793)
32 export-administration-act-south-africa=y (61.8391)
33 religious-groups-in-schools=y (62.5287)
```

(c)

in

democrat head

republican head

(d-1)

apriori.exe -s30 -c70 -n2 -tr -R"votes.app" votes.tab vote.out3.txt

(d-2)

19 rules are generated.

(d-3)

```
1 republican——vote yes——education—spending
2 democrat——vote yes——adoption—of—the—budget—resolution
3 republican——vote yes——physician—fee—freeze
4 democrat——vote yes——aid—to—nicaraguan—contras
5 democrat——vote yes——mx—missile
6 republican——vote yes——el—salvador—aid
```

(d-4)

The 19 rules generated in 3d

Rule	Support	Confidence
synfuels-corporation-cutback=y → democrat	34.4828	86
religious-groups-in-schools=n → democrat	34.9425	88.8158
adoption-of-the-budget-resolution=n → republican	39.3103	83.0409
education-spending=y → republican	39.3103	78.9474
physician-fee-freeze=y → republican	40.6897	92.0904
aid-to-nicaraguan-contras=n → republican	40.9195	74.7191
mx-missile=n → republican	47.3563	70.8738
el-salvador-aid=y → republican	48.7356	74.0566
crime=n → democrat	39.0805	98.2353
duty-free-exports=y → democrat	40	91.954
handicapped-infants=y → democrat	42.9885	83.4225
superfund-right-to-sue=n → democrat	46.2069	89.0547
mx-missile=y → democrat	47.5862	90.8213
el-salvador-aid=n → democrat	47.8161	96.1538
education-spending=n → democrat	53.5632	91.4163
anti-satellite-test-ban=y → democrat	54.9425	83.682
aid-to-nicaraguan-contras=y → democrat	55.6322	90.0826
physician-fee-freeze=n → democrat	56.7816	99.1903
adoption-of-the-budget-resolution=y → democrat	58.1609	91.3043

(e-1)

33 rules are generated.

(There're 34 rules generated, but the last one is a null one.)

(e-2)

Representatives do not vote along their party lines on the following bills:

```
1 religious—groups—in—school
2 synfuels—corporation—cutback
```

The 33 rules generated in 3e

Rule	Support	Confidence
religious-groups-in-schools=y → democrat	62.5287	45.2206
synfuels-corporation-cutback=n → democrat	60.6897	47.7273
synfuels-corporation-cutback=n → republican	60.6897	52.2727
religious-groups-in-schools=y → republican	62.5287	54.7794
handicapped-infants=n → republican	54.2529	56.7797
immigration=y → democrat	49.6552	57.4074
duty-free-exports=n → republican	53.5632	60.9442
water-project-cost-sharing=y → democrat	44.8276	61.5385
water-project-cost-sharing=n → democrat	44.1379	61.9792
crime=y → republican	57.0115	63.7097
export-administration-act-south-africa=y → democrat	61.8391	64.3123
superfund-right-to-sue=y → republican	48.046	65.0718
immigration=n → democrat	48.7356	65.566
anti-satellite-test-ban=n → republican	41.8391	67.5824
mx-missile=n → republican	47.3563	70.8738
el-salvador-aid=y → republican	48.7356	74.0566
aid-to-nicaraguan-contras=n → republican	40.9195	74.7191
education-spending=y → republican	39.3103	78.9474
adoption-of-the-budget-resolution=n → republican	39.3103	83.0409
handicapped-infants=y → democrat	42.9885	83.4225
anti-satellite-test-ban=y → democrat	54.9425	83.682
synfuels-corporation-cutback=y → democrat	34.4828	86
religious-groups-in-schools=n → democrat	34.9425	88.8158
superfund-right-to-sue=n → democrat	46.2069	89.0547
aid-to-nicaraguan-contras=y → democrat	55.6322	90.0826
mx-missile=y → democrat	47.5862	90.8213
adoption-of-the-budget-resolution=y → democrat	58.1609	91.3043
education-spending=n → democrat	53.5632	91.4163
duty-free-exports=y → democrat	40	91.954
physician-fee-freeze=y → republican	40.6897	92.0904
el-salvador-aid=n → democrat	47.8161	96.1538
crime=n → democrat	39.0805	98.2353
physician-fee-freeze=n → democrat	56.7816	99.1903