**I.Chạy apriori(Mô tả chi tiết)**

|  |  |  |
| --- | --- | --- |
| Với minsup=65%((65\*20/100)=13)  C1. | Yes/democrat | No/republican |
| handicapped-infants | 9 | 11 |
| water-project-cost-sharing | 8 | 11 |
| adoption-of-the-budget-resolution | 14 | 6 |
| physician-fee-freeze | 10 | 10 |
| el-salvador-aid | 13 | 7 |
| religious-groups-in-schools | 13 | 7 |
| anti-satellite-test-ban | 9 | 11 |
| aid-to-nicaraguan-contras | 8 | 12 |
| mx-missile | 9 | 10 |
| Immigration | 15 | 5 |
| synfuels-corporation-cutback | 10 | 10 |
| education-spending | 11 | 9 |
| superfund-right-to-sue | 14 | 6 |
| Crime | 17 | 3 |
| duty-free-exports | 4 | 16 |
| export-administration-act-south-africa | 10 | 6 |
| Class Name | 12 | 8 |

|  |  |  |
| --- | --- | --- |
| L1. | Yes/democrat | No/republican |
| adoption-of-the-budget-resolution | 14 |  |
| el-salvador-aid | 13 |  |
| religious-groups-in-schools | 13 |  |
| Immigration | 15 |  |
| superfund-right-to-sue | 14 |  |
| Crime | 17 |  |
| duty-free-exports |  | 16 |

**C2**

|  |  |
| --- | --- |
| adoption-of-the-budget-resolution Y / el-salvador-aid Y | 6 |
| adoption-of-the-budget-resolution Y / religious-groups-in-schools Y | 8 |
| adoption-of-the-budget-resolution Y / immigration Y | 11 |
| adoption-of-the-budget-resolution Y / superfund-right-to-sue Y | 8 |
| adoption-of-the-budget-resolution Y / crime Y | 11 |
| adoption-of-the-budget-resolution Y / duty-free-exports N | 10 |
| el-salvador-aid Y / religious-groups-in-schools Y | 11 |
| el-salvador-aid Y / immigration Y | 11 |
| el-salvador-aid Y / superfund-right-to-sue Y | 13 |
| el-salvador-aid Y /crime Y | 13 |
| el-salvador-aid Y / duty-free-exports N | 13 |
| religious-groups-in-schools Y / immigration Y | 11 |
| religious-groups-in-schools Y / superfund-right-to-sue Y | 11 |
| religious-groups-in-schools Y / crime Y | 13 |
| religious-groups-in-schools Y / duty-free-exports N | 12 |
| immigration Y / superfund-right-to-sue Y | 11 |
| immigration Y / crime Y | 15 |
| immigration Y / duty-free-exports N | 14 |
| superfund-right-to-sue Y / crime Y | 13 |
| superfund-right-to-sue Y / duty-free-exports N | 13 |
| crime Y / duty-free-exports N | 16 |

**L2**

|  |  |
| --- | --- |
| el-salvador-aid Y / superfund-right-to-sue Y | 13 |
| el-salvador-aid Y /crime Y | 13 |
| el-salvador-aid Y / duty-free-exports N | 13 |
| religious-groups-in-schools Y / crime Y | 13 |
| immigration Y / crime Y | 15 |
| immigration Y / duty-free-exports N | 14 |
| superfund-right-to-sue Y / crime Y | 13 |
| superfund-right-to-sue Y / duty-free-exports N | 13 |
| crime Y / duty-free-exports N | 16 |

**C3**

|  |  |
| --- | --- |
| el-salvador-aid Y / superfund-right-to-sue Y / crime Y | 13 |
| el-salvador-aid Y / superfund-right-to-sue Y / duty-free-exports N | 13 |
| el-salvador-aid Y /crime Y / duty-free-exports N | 13 |
| immigration Y / crime Y / duty-free-exports N | 14 |
| superfund-right-to-sue Y / crime Y / duty-free-exports N | 13 |

**L3**

|  |  |
| --- | --- |
| el-salvador-aid Y / superfund-right-to-sue Y / crime Y | 13 |
| el-salvador-aid Y / superfund-right-to-sue Y / duty-free-exports N | 13 |
| el-salvador-aid Y /crime Y / duty-free-exports N | 13 |
| immigration Y / crime Y / duty-free-exports N | 14 |
| superfund-right-to-sue Y / crime Y / duty-free-exports N | 13 |

**C4**

|  |  |
| --- | --- |
| el-salvador-aid Y / superfund-right-to-sue Y / crime Y / duty-free-exports N | 13 |

**L4**

|  |  |
| --- | --- |
| el-salvador-aid Y / superfund-right-to-sue Y / crime Y / duty-free-exports N | 13 |

**C5 Không có**

**Kết luận:** các tập phổ biến thỏa ngưỡng minsup=65%

L1: { {adoption-of-the-budget-resolution,el-salvador-aid,religious-groups-in-schools,immigration,superfund-right-to-sue,crime,duty-free-exports}}

L2:{ {el-salvador-aid Y / superfund-right-to-sue Y,el-salvador-aid Y /crime Y,el-salvador-aid Y / duty-free-exports N,religious-groups-in-schools Y / crime Y,immigration Y / crime Y,immigration Y / duty-free-exports N,superfund-right-to-sue Y / crime Y,superfund-right-to-sue Y / duty-free-exports N,crime Y / duty-free-exports N}}

L3:{ {el-salvador-aid Y / superfund-right-to-sue Y / crime Y,el-salvador-aid Y / superfund-right-to-sue Y / duty-free-exports N,el-salvador-aid Y /crime Y / duty-free-exports N,immigration Y / crime Y / duty-free-exports N,superfund-right-to-sue Y / crime Y / duty-free-exports N}}

L4:{ {el-salvador-aid Y / superfund-right-to-sue Y / crime Y / duty-free-exports N}}

Ngưỡng minsup=65% và minconf=90%

+ **L4:** el-salvador-aid Y / superfund-right-to-sue Y / crime Y / duty-free-exports N

|  |  |  |  |
| --- | --- | --- | --- |
| el-salvador-aid Y => superfund-right-to-sue Y / crime Y / duty-free-exports N | conf=13/13 | 100% |  |
| superfund-right-to-sue Y => el-salvador-aid Y / crime Y / duty-free-exports N | conf=13/14 | 93% |  |
| crime Y => el-salvador-aid Y / superfund-right-to-sue Y / duty-free-exports N | conf=13/17 | 76% | L |
| duty-free-exports N => el-salvador-aid Y / superfund-right-to-sue Y / crime Y | conf=13/16 | 81% | L |
| el-salvador-aid Y / superfund-right-to-sue Y => crime Y / duty-free-exports N | conf=13/13 | 100% |  |
| el-salvador-aid Y / crime Y => superfund-right-to-sue Y / duty-free-exports N | conf=13/13 | 100% |  |
| el-salvador-aid Y / duty-free-exports N => superfund-right-to-sue Y / crime Y | conf=13/13 | 100% |  |
| superfund-right-to-sue Y / crime Y => el-salvador-aid Y / duty-free-exports N | conf=13/13 | 100% |  |
| superfund-right-to-sue Y / duty-free-exports N => el-salvador-aid Y / crime Y | conf=13/13 | 100% |  |
| crime Y / duty-free-exports N => el-salvador-aid Y / superfund-right-to-sue Y | conf=13/16 | 81% | L |
| el-salvador-aid Y / superfund-right-to-sue Y / crime Y => duty-free-exports N | conf=13/13 | 100% |  |
| el-salvador-aid Y / superfund-right-to-sue Y / duty-free-exports N => crime Y | conf=13/13 | 100% |  |
| el-salvador-aid Y / crime Y / duty-free-exports N => superfund-right-to-sue Y | conf=13/13 | 100% |  |
| superfund-right-to-sue Y / crime Y / duty-free-exports N => el-salvador-aid Y | conf=13/13 | 100% |  |

**+L3:**

|  |  |  |  |
| --- | --- | --- | --- |
| el-salvador-aid Y => superfund-right-to-sue Y / crime Y | conf=13/13 | 100% |  |
| superfund-right-to-sue Y => el-salvador-aid Y / crime Y | conf=13/14 | 93% |  |
| crime Y => el-salvador-aid Y / superfund-right-to-sue Y | conf=13/17 | 76% | L |
| el-salvador-aid Y / superfund-right-to-sue Y => crime Y | conf=13/13 | 100% |  |
| el-salvador-aid Y / crime Y => superfund-right-to-sue Y | conf=13/13 | 100% |  |
| superfund-right-to-sue Y / crime Y => el-salvador-aid Y | conf=13/13 | 100% |  |

**. el-salvador-aid Y / superfund-right-to-sue Y / crime Y**

**. el-salvador-aid Y / superfund-right-to-sue Y / duty-free-exports N**

|  |  |  |  |
| --- | --- | --- | --- |
| el-salvador-aid Y => superfund-right-to-sue Y / duty-free-exports N | conf=13/13 | 100% |  |
| superfund-right-to-sue Y => el-salvador-aid Y / duty-free-exports N | conf=13/14 | 93% |  |
| duty-free-exports N => el-salvador-aid Y / superfund-right-to-sue Y | conf=13/16 | 81% | L |
| el-salvador-aid Y / superfund-right-to-sue Y => duty-free-exports N | conf=13/13 | 100% |  |
| el-salvador-aid Y / duty-free-exports N => superfund-right-to-sue Y | conf=13/13 | 100% |  |
| superfund-right-to-sue Y / duty-free-exports N => el-salvador-aid Y | conf=13/13 | 100% |  |

**. el-salvador-aid Y /crime Y / duty-free-exports N**

|  |  |  |  |
| --- | --- | --- | --- |
| el-salvador-aid Y => crime Y / duty-free-exports N | conf=13/13 | 100% |  |
| crime Y => el-salvador-aid Y / duty-free-exports N | conf=13/17 | 76% | L |
| duty-free-exports N => el-salvador-aid Y /crime Y | conf=13/16 | 81% | L |
| el-salvador-aid Y /crime Y => duty-free-exports N | conf=13/13 | 100% |  |
| el-salvador-aid Y / duty-free-exports N => crime Y | conf=13/13 | 100% |  |
| crime Y / duty-free-exports N => el-salvador-aid Y | conf=13/16 | 81% | L |

**. immigration Y / crime Y / duty-free-exports N**

|  |  |  |  |
| --- | --- | --- | --- |
| immigration Y => crime Y / duty-free-exports N | conf=14/15 | 93% |  |
| crime Y => immigration Y / duty-free-exports N | conf=14/17 | 82% | L |
| duty-free-exports N => immigration Y / crime Y | conf=14/16 | 88% | L |
| immigration Y / crime Y => duty-free-exports N | conf=14/15 | 93% |  |
| immigration Y / duty-free-exports N => crime Y | conf=14/14 | 100% |  |
| crime Y / duty-free-exports N => immigration Y | conf=14/16 | 88% | L |

**. superfund-right-to-sue Y / crime Y / duty-free-exports N**

|  |  |  |  |
| --- | --- | --- | --- |
| superfund-right-to-sue Y => crime Y / duty-free-exports N | conf=13/14 | 93% |  |
| crime Y => superfund-right-to-sue Y / duty-free-exports N | conf=13/17 | 76% | L |
| duty-free-exports N => superfund-right-to-sue Y / crime Y | conf=13/16 | 81% | L |
| superfund-right-to-sue Y / crime Y => duty-free-exports N | conf=13/13 | 100% |  |
| superfund-right-to-sue Y / duty-free-exports N => crime Y | conf=13/13 | 100% |  |
| crime Y / duty-free-exports N => superfund-right-to-sue Y | conf=13/16 | 81% | L |

**L2**

**. el-salvador-aid Y / superfund-right-to-sue Y**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| el-salvador-aid Y => superfund-right-to-sue Y | 13 | conf=13/13 | 100% |  |
| superfund-right-to-sue Y=>el-salvador-aid Y | 13 | conf=13/14 | 93% |  |

**.** **crime Y / el-salvador-aid Y**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| crime Y=> el-salvador-aid Y | 13 | conf=13/17 | 76% | L |
| el-salvador-aid Y =>crime Y | 13 | conf=13/13 | 100% |  |

**.** **duty-free-exports N=>el-salvador-aid Y**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| duty-free-exports N=>el-salvador-aid Y | 13 | conf=13/16 | 81% | L |
| el-salvador-aid Y => duty-free-exports N | 13 | conf=13/13 | 100% |  |

**.** **crime Y=>religious-groups-in-schools Y**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| crime Y=>religious-groups-in-schools Y | 13 | conf=13/17 | 76% | L |
| religious-groups-in-schools Y => crime Y | 13 | conf=13/13 | 100% |  |

**.** **crime Y=>immigration Y**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| crime Y=>immigration Y | 15 | conf=15/17 | 86% | L |
| immigration Y => crime Y | 15 | conf=15/15 | 100% |  |

**.** **duty-free-exports N=>immigration Y**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| duty-free-exports N=>immigration Y | 14 | conf=14/14 | 100% |  |
| immigration Y => duty-free-exports N | 14 | conf=14/15 | 93% |  |

**.** **superfund-right-to-sue Y => crime Y**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| superfund-right-to-sue Y => crime Y | 13 | conf=13/14 | 93% |  |
| crime Y=>superfund-right-to-sue Y | 13 | conf=13/17 | 76% | L |

**.** **superfund-right-to-sue Y => duty-free-exports N**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| superfund-right-to-sue Y => duty-free-exports N | 13 | conf=13/14 | 93% |  |
| duty-free-exports N=>superfund-right-to-sue Y | 13 | conf=13/16 | 81% | L |

**. crime Y => duty-free-exports N**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| crime Y => duty-free-exports N | 16 | conf=16/17 | 94% |  |
| duty-free-exports N=>crime Y | 16 | conf=16/16 | 100% |  |

**=>Kết luận:** các luật kết hợp thỏa mãng ngưỡng minsup=65%, minconf=90%

|  |
| --- |
| el-salvador-aid Y => superfund-right-to-sue Y / crime Y / duty-free-exports N |
| superfund-right-to-sue Y => el-salvador-aid Y / crime Y / duty-free-exports N |
| el-salvador-aid Y / superfund-right-to-sue Y => crime Y / duty-free-exports N |
| el-salvador-aid Y / crime Y => superfund-right-to-sue Y / duty-free-exports N |
| el-salvador-aid Y / duty-free-exports N => superfund-right-to-sue Y / crime Y |
| superfund-right-to-sue Y / crime Y => el-salvador-aid Y / duty-free-exports N |
| superfund-right-to-sue Y / duty-free-exports N => el-salvador-aid Y / crime Y |
| el-salvador-aid Y / superfund-right-to-sue Y / crime Y => duty-free-exports N |
| el-salvador-aid Y / superfund-right-to-sue Y / duty-free-exports N => crime Y |
| el-salvador-aid Y / crime Y / duty-free-exports N => superfund-right-to-sue Y |
| superfund-right-to-sue Y / crime Y / duty-free-exports N => el-salvador-aid Y |
| el-salvador-aid Y => superfund-right-to-sue Y / crime Y |
| superfund-right-to-sue Y => el-salvador-aid Y / crime Y |
| el-salvador-aid Y / superfund-right-to-sue Y => crime Y |
| el-salvador-aid Y / crime Y => superfund-right-to-sue Y |
| superfund-right-to-sue Y / crime Y => el-salvador-aid Y |
| el-salvador-aid Y => superfund-right-to-sue Y / duty-free-exports N |
| superfund-right-to-sue Y => el-salvador-aid Y / duty-free-exports N |
| el-salvador-aid Y / superfund-right-to-sue Y => duty-free-exports N |
| el-salvador-aid Y / duty-free-exports N => superfund-right-to-sue Y |
| superfund-right-to-sue Y / duty-free-exports N => el-salvador-aid Y |
| el-salvador-aid Y => crime Y / duty-free-exports N |
| el-salvador-aid Y /crime Y => duty-free-exports N |
| el-salvador-aid Y / duty-free-exports N => crime Y |
| immigration Y => crime Y / duty-free-exports N |
| immigration Y / crime Y => duty-free-exports N |
| immigration Y / duty-free-exports N => crime Y |
| superfund-right-to-sue Y => crime Y / duty-free-exports N |
| superfund-right-to-sue Y / crime Y => duty-free-exports N |
| superfund-right-to-sue Y / duty-free-exports N => crime Y |
|  |
| el-salvador-aid Y => superfund-right-to-sue Y |
| superfund-right-to-sue Y=>el-salvador-aid Y |
| el-salvador-aid Y =>crime Y |
| el-salvador-aid Y => duty-free-exports N |
| religious-groups-in-schools Y => crime Y |
| immigration Y => crime Y |
| duty-free-exports N=>immigration Y |
| immigration Y => duty-free-exports N |
| superfund-right-to-sue Y => crime Y |
| superfund-right-to-sue Y => duty-free-exports N |
| crime Y => duty-free-exports N |
| duty-free-exports N=>crime Y |

**II.Chạy apriori(Weka)**

**1.weka**

=== Run information ===

Scheme: weka.associations.Apriori -N 50 -T 0 -C 0.9 -D 0.05 -U 0.9 -M 0.65 -S -1.0 -c -1

Relation: apriori

Instances: 20

Attributes: 17

handicapped-infants

water-project-cost-sharing

adoption-of-the-budget-resolution

physician-fee-freeze

el-salvador-aid

religious-groups-in-schools

anti-satellite-test-ban

aid-to-nicaraguan-contras

mx-missile

immigration

synfuels-corporation-cutback

education-spending

superfund-right-to-sue

crime

duty-free-exports

export-administration-act-south-africa

Class-Name

=== Associator model (full training set) ===

Apriori

=======

Minimum support: 0.65 (13 instances)

Minimum metric <confidence>: 0.9

Number of cycles performed: 5

Generated sets of large itemsets:

Size of set of large itemsets L(1): 7

Size of set of large itemsets L(2): 9

Size of set of large itemsets L(3): 5

Size of set of large itemsets L(4): 1

Best rules found:

1. duty-free-exports=n 16 ==> crime=y 16 conf:(1)

2. immigration=y 15 ==> crime=y 15 conf:(1)

3. immigration=y duty-free-exports=n 14 ==> crime=y 14 conf:(1)

4. el-salvador-aid=y 13 ==> superfund-right-to-sue=y 13 conf:(1)

5. el-salvador-aid=y 13 ==> crime=y 13 conf:(1)

6. el-salvador-aid=y 13 ==> duty-free-exports=n 13 conf:(1)

7. religious-groups-in-schools=y 13 ==> crime=y 13 conf:(1)

8. superfund-right-to-sue=y crime=y 13 ==> el-salvador-aid=y 13 conf:(1)

9. el-salvador-aid=y crime=y 13 ==> superfund-right-to-sue=y 13 conf:(1)

10. el-salvador-aid=y superfund-right-to-sue=y 13 ==> crime=y 13 conf:(1)

11. el-salvador-aid=y 13 ==> superfund-right-to-sue=y crime=y 13 conf:(1)

12. superfund-right-to-sue=y duty-free-exports=n 13 ==> el-salvador-aid=y 13 conf:(1)

13. el-salvador-aid=y duty-free-exports=n 13 ==> superfund-right-to-sue=y 13 conf:(1)

14. el-salvador-aid=y superfund-right-to-sue=y 13 ==> duty-free-exports=n 13 conf:(1)

15. el-salvador-aid=y 13 ==> superfund-right-to-sue=y duty-free-exports=n 13 conf:(1)

16. el-salvador-aid=y duty-free-exports=n 13 ==> crime=y 13 conf:(1)

17. el-salvador-aid=y crime=y 13 ==> duty-free-exports=n 13 conf:(1)

18. el-salvador-aid=y 13 ==> crime=y duty-free-exports=n 13 conf:(1)

19. superfund-right-to-sue=y duty-free-exports=n 13 ==> crime=y 13 conf:(1)

20. superfund-right-to-sue=y crime=y 13 ==> duty-free-exports=n 13 conf:(1)

21. superfund-right-to-sue=y crime=y duty-free-exports=n 13 ==> el-salvador-aid=y 13 conf:(1)

22. el-salvador-aid=y crime=y duty-free-exports=n 13 ==> superfund-right-to-sue=y 13 conf:(1)

23. el-salvador-aid=y superfund-right-to-sue=y duty-free-exports=n 13 ==> crime=y 13 conf:(1)

24. el-salvador-aid=y superfund-right-to-sue=y crime=y 13 ==> duty-free-exports=n 13 conf:(1)

25. superfund-right-to-sue=y duty-free-exports=n 13 ==> el-salvador-aid=y crime=y 13 conf:(1)

26. superfund-right-to-sue=y crime=y 13 ==> el-salvador-aid=y duty-free-exports=n 13 conf:(1)

27. el-salvador-aid=y duty-free-exports=n 13 ==> superfund-right-to-sue=y crime=y 13 conf:(1)

28. el-salvador-aid=y crime=y 13 ==> superfund-right-to-sue=y duty-free-exports=n 13 conf:(1)

29. el-salvador-aid=y superfund-right-to-sue=y 13 ==> crime=y duty-free-exports=n 13 conf:(1)

30. el-salvador-aid=y 13 ==> superfund-right-to-sue=y crime=y duty-free-exports=n 13 conf:(1)

31. crime=y 17 ==> duty-free-exports=n 16 conf:(0.94)

32. immigration=y 15 ==> duty-free-exports=n 14 conf:(0.93)

33. immigration=y crime=y 15 ==> duty-free-exports=n 14 conf:(0.93)

34. immigration=y 15 ==> crime=y duty-free-exports=n 14 conf:(0.93)

35. superfund-right-to-sue=y 14 ==> el-salvador-aid=y 13 conf:(0.93)

36. superfund-right-to-sue=y 14 ==> crime=y 13 conf:(0.93)

37. superfund-right-to-sue=y 14 ==> duty-free-exports=n 13 conf:(0.93)

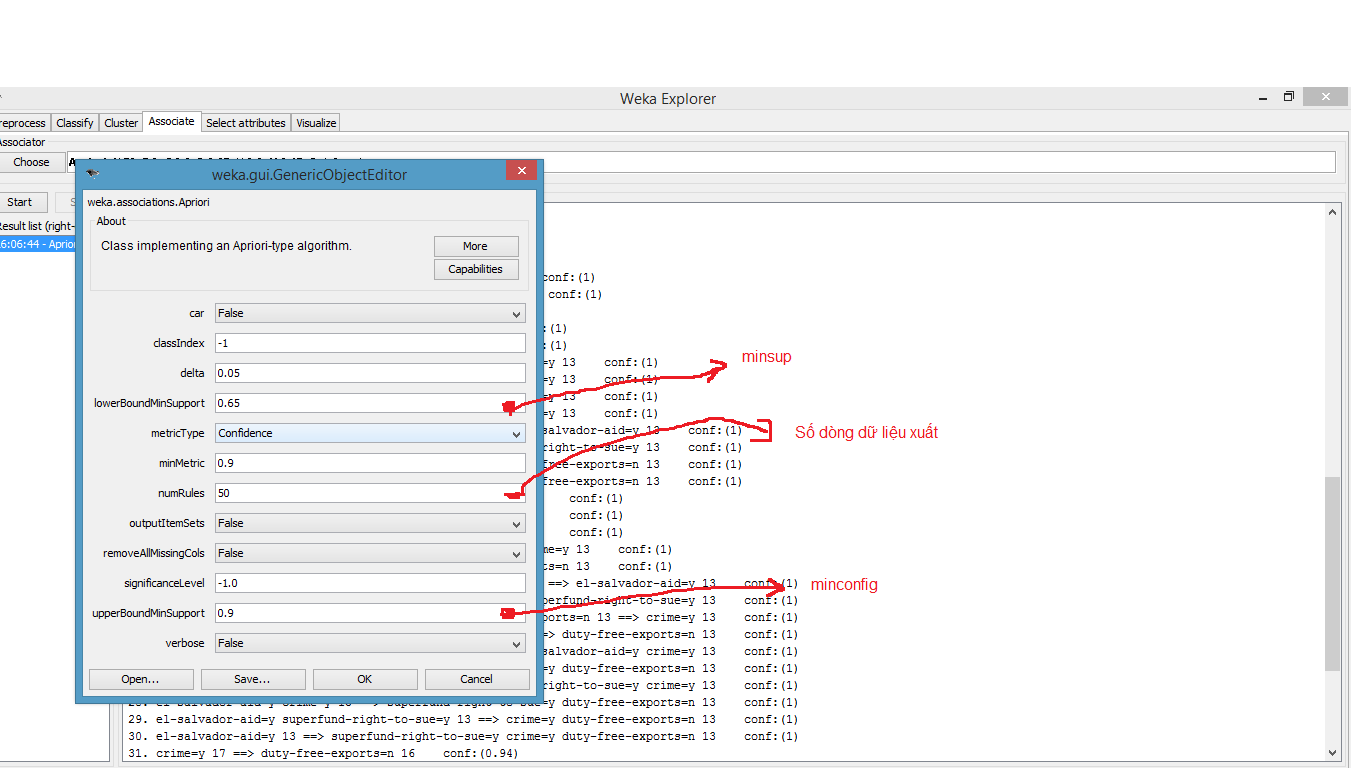
38. superfund-right-to-sue=y 14 ==> el-salvador-aid=y crime=y 13 conf:(0.93)

39. superfund-right-to-sue=y 14 ==> el-salvador-aid=y duty-free-exports=n 13 conf:(0.93)

40. superfund-right-to-sue=y 14 ==> crime=y duty-free-exports=n 13 conf:(0.93)

41. superfund-right-to-sue=y 14 ==> el-salvador-aid=y crime=y duty-free-exports=n 13 conf:(0.93)

**2. ý nghĩa thông số cài đặt**

****