

نظام الكتروني لتوزيع طلبة التدريب الصيفي على المنظمات مع حالة مقارنة لخوارزميات قواعد الارتباط

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المستخلص :-

يُعد تدريب الطلبة خلال الإجازة الصيفية أحد أشكال التدريب الهادفة إلى تعريف الطلاب بواقع البيئة العملية وما تحتاج إليه من جد وانضباط ، كما أنه من جهة أخرى يتيح الفرصة لمؤسسات القطاع العام والخاص للتعرف على إمكانيات الطلاب ومهاراتهم ، هذا بالإضافة إلى فوائده فيما يتعلق بتوجيه الشباب نحو الاستفادة من الإجازة الصيفية .ولحل مشكلة توزيع الطلاب على المنظمات ولضمان التوافقية بين رغبات الطلبة واستيعاب الدوائر الحكومية والأهلية تم استخدام بعض من خوارزميات تنقيب البيانات (Aprior, Predictive) لدعم تطبيقات متنوعة تتعلق بالأعمال ولاكتشاف علاقات هامة مخفية في مجموعة بيانات ضخمة ، فضلاً عن استخدام مستودع البيانات (DW) لغرض إعداد تقارير يتضح من خلالها أعداد الطلبة المطلوب تدريبهم في المنظمات وحسب التخصصات لكل قسم من أقسام كلية الإدارة والاقتصاد (بيئة التطبيق) مع أعداد الطلبة المرشحين للتدريب في كل قسم باستخدام برنامج (Oracle 10g.) مع البرمجية الجاهزة Weka.

Organizations with Comparative Study of Association Rule Algorithms

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Abstract :-

The training of students is considered as one of the most promising forms of training to inform students with the reality of practical environment and the what they require from serious and exact work. It may give the chance to other public sector organizations to be acquainted with the students' abilities and skills, in addition to the benefits of informing youths to join summer vocation.

In order to solve the problem of students distribution to organizations and guarantee the equivalency between students desires and the capacity of governmental and privates offices, some algorithms were used to mine up data to support miscellaneous applications related to the works and uncover essential hidden relationships with huge data.

The data mining were also used to set reports that may refer to the delicate number of students required for training according to the specializations in the departments of the College of Administration and Economics (application environments) with the number of nominee students for training in each department using (oracle 10g.) with software programming, Weka.

Keyword: Data mining ,Apriori Algorithm, Data Warehouse.

1. Introduction

The practicum center of University of Mosul responsible with the placement of students in the industry for the internship program, it is experiencing difficulty in matching organization's requirement with the student profile for several reasons .This situation could lead to a mismatched between organization requirement and students' background , Hence students will face problems in giving good service to the company .On the other hand, companies too could be facing difficulties in training the students and assigning them with a project.

2. Literature review

2.1 Data Warehouse (DW)

A data warehouse is a centralized and universal of all corporate information . This was to be a subject-oriented database, integrated and containing historical information from multiple data sources, nonvolatile and exclusively for the processes of strategic decision support. In general , the data warehouse is maintained separately from operational databases of the organization for several reasons. (Walid &et.al,2011:952).

A data warehouse (DW) is a special database used for storing business-oriented information for future analysis and decision-making (Lior and Shmilovici,2008:2).

2.2 OLAP

Data warehouses and OLAP are necessary elements of Decision Support Systems (DSSs). They enable business decision makers to creatively approach, analyze and understand business problems. While data warehouses are built to store very large amounts of integrated data used to assist the decision-making process, the concept of OLAP, which is first formulated in 1993 by (Joe,2006:58,62) to enable business decision makers to work with data warehouses, supports dynamic synthesis, analysis, and consolidation of large volumes of multidimensional data. Two of the most important ways to pursue high performance and usability of Data Cube computation are (Frank K., Todd and Boon ,2007:184-197).

a) Speeding Up , b) Reducing Storage Space.

2.2.1 OLAP Guidelines

Multidimensionality is at the core of a number of OLAP systems (database and front-end tools) available today. Dr. E. F. Coded, the "father" of the relational model, has formulated a list of guidelines and requirements as the basis for selecting OLAP systems:

1- Basic Features (Multidimensional Conceptual View, Intuitive Data Manipulation , Accessibility , Batch Extraction versus Interpretive Extraction , OLAP Analysis Models , Client / server architecture , Transparency , Multi-user support) .

2- Special Features (Treatment of Non normalized Data , Store OLAP Results , Treatment of Missing Values) .

3- Reporting Features (Flexible Reporting , Uniform Reporting Performance).

(Alex,Stephen,2008:205-252),(<http://www.1keydata.com>)

2.2.2 Categorization of OLAP

* **ROLAP (Relational OLAP):**

* **MOLAP (Multidimensional OLAP):**

In the MOLAP, data is extracted from the data warehouse and aggregated into a data structure, commonly referred to as a cube, for analysis (Michelle ,Arlene,2009,4) .Uses a specialized data store with preaggregated summaries to store the data. The MOLAP data store is built specifically to handle multidimensional queries and offers fast, efficient, and manageable access to multidimensional data

(Ann & Matthias,2000:44).

* **HOLAP (Hybrid OLAP):**

2.3 Association rule algorithms

Association rules are used to find the frequent pattern, association or correlation in a transaction database. Association rule mining can be used in Basket Data Analysis , Educational Data mining , Classification ,Clustering etc. The association Rule algorithm is Apriori, sampling, partitioning & Parallel Algorithm. (Sunita B. & Lobo,2011:20).

2.3.1 Apriori Association Rule

The Apriori algorithm was first proposed by Agrawal (Brown,2008:2) It uses prior knowledge of frequent tools for association rule mining . The basic idea of the Apriori Algorithm is to generate frequent item set of a given dataset and then scan the dataset to check if their counts are really large the process is iterative and candidates of any pass are generated by joining frequent item set of the proceeding pass .Apriori is a confidence-based Association Rule Mining algorithm The confidence is simply accuracy to evaluate rules ,produced by this algorithm .The rules are ranked according to the confidence value. if two or more rules share the same confidence then they are initially ordered using Their support and secondly the time of discovery .

(Mohammed M. ,A. & Kevin S.,2008:100)

Support : for the association rule $X \rightarrow y$ is the percentage of transactions in the database that contains $X \cup Y$.

Confidence: For the association rule is $X \rightarrow y$ is the ratio of the number of transactions that contains $X \cup Y$ to the number of transactions that contain X.

Figure (1) shows the generation of item sets & frequent Item sets where the minimum support count is 2.

Figure (2) shows the flow chart for the Apriori Association rule algorithm.

To generate the association rule from frequent item set we use the following rule :

- For each frequent item set L, find all nonempty subsets of L .
- For each non-empty subset of L, write the association rule $S \rightarrow (L-S)$ if support count of L/support count of S \geq Minimum Confidence .

The best rule from the item set $L = \{2,3,5\}$ are calculated as follows

Consider the minimum support is a 2 & minimum confidence is 70% all nonempty subsets of $\{2,3$ and 5 $\}$ are $\{2,3\}$, $\{3,5\}$, $\{2\}$, $\{3\}$, $\{5\}$. (Sunita B. & Lobo,2012:20)

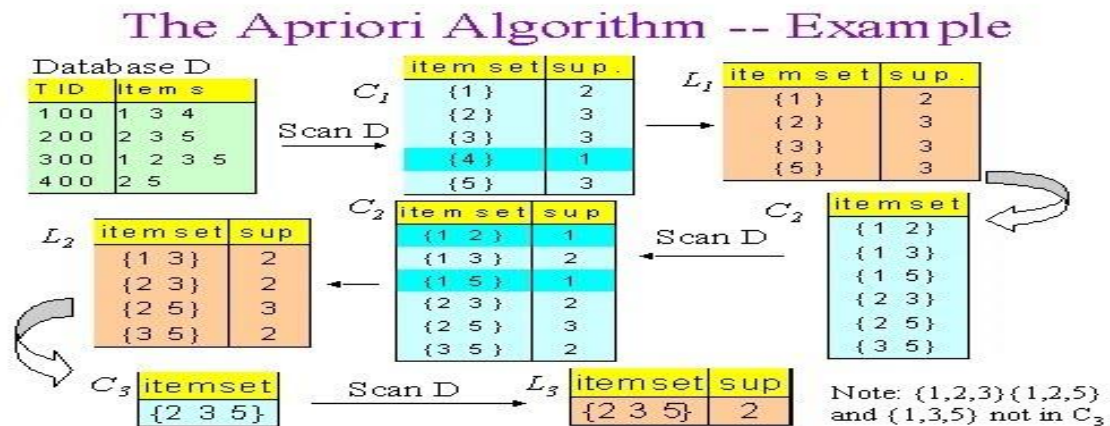


Figure (1) generation item sets & frequent item sets

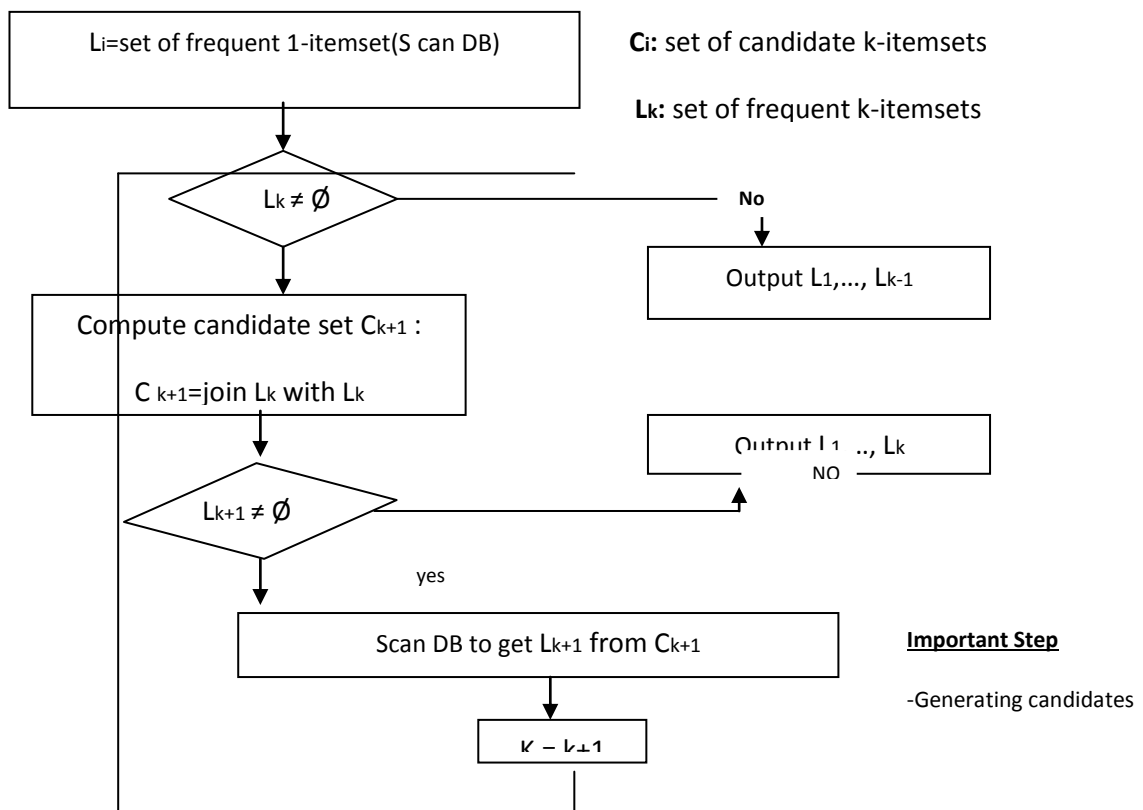


Figure (2) Flow Chart For Apriori Association Rule Algorithm

* Predictive Aprior

In the case of Apriori , every so often we can find rules with higher confidence but low support on respective items of generating rules , sometimes , rules are produced with large support but low confidence ,(T.Scheffer,2001:24-435) introduced this algorithm with the concept of "larger support has to trade against a higher confidence ". Predictive Apriori is also a confidence – based ARM algorithm . But rules ranked by this algorithm are sorted according to "expected predictive accuracy". This interestingness measure of predictive Apriori suits the requirement of a classification task (S.Mather, M. and E.,2004:38-549) it tries to maximize expected accuracy of an association rule rather than confidence in Apriori . Finding a unique association rule mining algorithm based on data characteristics.

3. Experiment Result

3.1 Appendix (1) explain the flowchart about the summer training system .

3.2 Designing

A special database has been designed for summer training for the college of Administration and Economics for all the departments concerned including all the dimensions of summer training and as follows:

1-Student : a student is regarded as one of the training operation elements (the most important element),for the prospects and attitudes he has and the relationship of that with the level of training and prior planning which is the responsibility of the Administration Departments to attain the expected benefits and the reflection of that on the training operation as a definite gain . A special Form has been designed for the student related to the table of the student existing in the database for summer training, and as explained in figure(3).

The screenshot shows a software window titled "Oracle Forms Runtime" with a menu bar (Action, Edit, Query, Block, Record, Field, Window, Help) and a toolbar. The main window is titled "WINDOW1" and contains a form titled "Personal Information of Student". The form has two columns of input fields: the left column includes "Student Number", "Student Gender" (a dropdown), "Department" (a dropdown), "In or Out City" (a dropdown), and "Study Type" (a dropdown); the right column includes "Student Name", "College", "Specilast", and "Student Address". Below these fields is a row of buttons: "ADD", "SAVE", "DELETE", "FIRST", "LAST", "PREVIOUS", "NEXT", and "EXIT". At the bottom left of the window, the status bar indicates "Record: 1/1".

Figure(3) personal Information of Student

2- A member of Teaching Staff : A member of teaching staff forms a basic foundation in the field of summer training , starting from the following up of a student at the site of training and drawing the shape of work for him ,together with the coordination of Practical supervisor at site and according to a prior prepared programme in a detailed manner and a follow up at the field of training and stating the weak and strong points in them and ruling out the weak points. And as the university lecturer acquaints himself with the nature and policy of site work which he intends to supervise and by doing that his experience and reaction with the concerned people will increase, and in turn this is reflected on the development of expertise , and so, three forms have been developed ; a form including the writing down of tasks that a student carries out inside the organization and as shown in figure No.(4), and figure No.(5) includes the following up of university lecturer (scientific supervisor) .and Practical supervisor (inside the organization) about the student through their giving the weekly merits for the student under training in that organization . and lastly ,the form that includes the name of Practical supervisor and the manager of the organization ,etc., as shown in figure No.(6).

General Evaluation

Student Number Task

Task Week1 Unupset Week1

Task Week2 Unupset Week2

Task Week3 Unupset Week3

Task Week4 Unupset Week4

General Level Indebat

Upset Sentfic Supervisor

Degree(30%) Date1

Degree(30%) Date2

Second Supervisor Date3

Degree(20%) Date4

Degree(20%) Finaldegree

ADD
SAVE
DELETE
FIRST
LAST
PREVIOUS
NEXT
EXIT

Figure(4) General Evaluation Form

Evaluation

Student Number	Task	technical level	Unupset
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Record: 1/1

Figure(5) Evaluation Form

The screenshot shows the Oracle Forms Runtime interface. The main window, titled 'WINDOW1', contains a form with the following fields:

Stud Number	<input type="text"/>	Directorate Name	<input type="text"/>
Phase	<input type="text"/>	Inti Date	<input type="text"/>
End Date	<input type="text"/>	Sentfic Supervisor	<input type="text"/>

At the bottom of the window, there is a status bar that reads 'Record: 1/1'.

Figure(6) general information student

3.3 Selection

Data used in this study was obtained from Departments of College of Admin & economics . These data have been obtain by different reports among others registered students report , student lists based on city Reports this data include all 2011-2012 Bachelor in management information & administration & Economic Department & Accounting department & Department of Banking and Financial Science . The initial data contain The performance profile gathered from a number of 194 students with 16 listed attributes which include company name , number, gender (female, male), Average, Dept/Accounting , Dept/ Banking, Dept/admin , Dept/Mis, Side, address, success stage , /first success stage /second, desire1, desire2, Class, The data contains various types of values either string or numeric value . The target is represented as the organization's name. The Organization name was grouped according to two Categories (Government , private) based on the discussion with the program coordinator , all 196 data are used in this study.

3.4MOLAP Sample Application

One instruction summer training for university students to create tables containing information on the number of students, section, site training (proposed) the training to be sent to the training unit at college and it prepared reports which include the preparation of students for each department and each department where after approaching state departments to send the number that can be taken in for the purposes of training students and then prepare a plan by the summer training unit for the purpose of

training students and then prepare a plan by the summer training unit for the distribution of students to the relevant departments and according to specialization for each section.

The following are the most important reports that have been obtained using model MOLAP through oracle 10g.

We can show:

- 1- The Dimension which contain (Dept. , Location, Time) that show The hierarchies and levels of time dimension shown in Figure (7) .
- 2- the hierarchy levels and the histogram shown in Figure (8) which represents the total number of students expected trained to be in Government Organizations and private sector for each Dept. at the College of Administration and Economics .
- 3- The number of students from each Department of the Departments expected to be trained in each of the government and private Organizations shown in Figure (9).
- 4- the installation of the dimensions of the data cube summer training, which includes three dimensions (time, department, Location) shown in Figure (10).

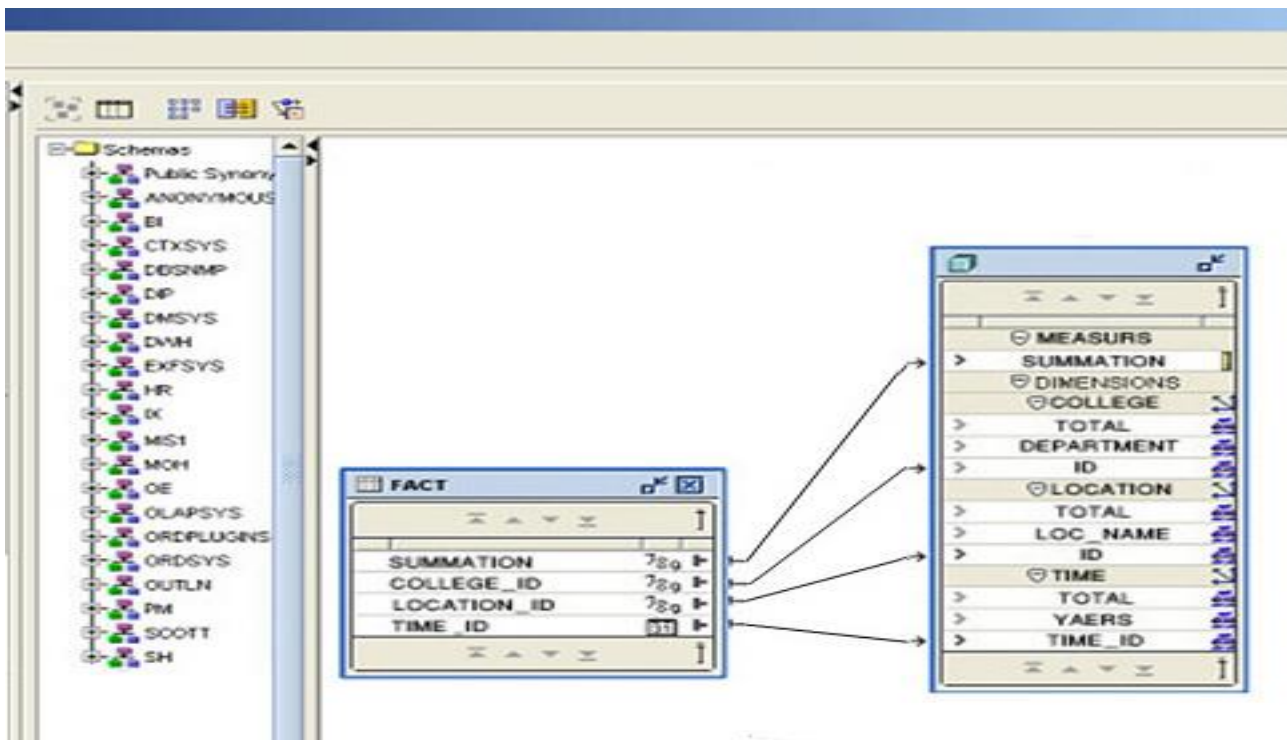


Figure (7) Fact Table

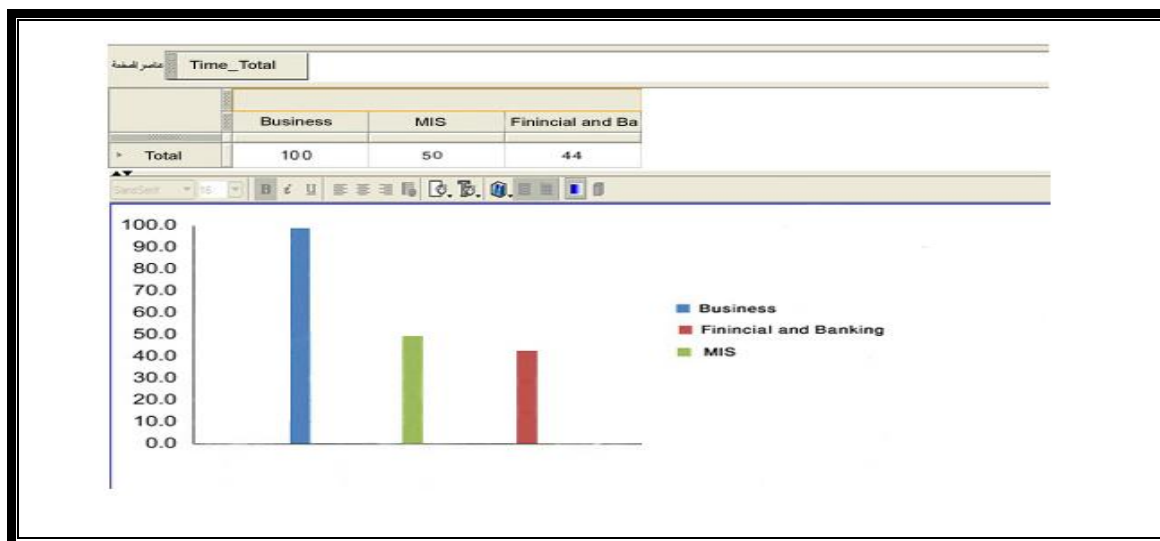


Figure (8) Total no. of students trained in organizations

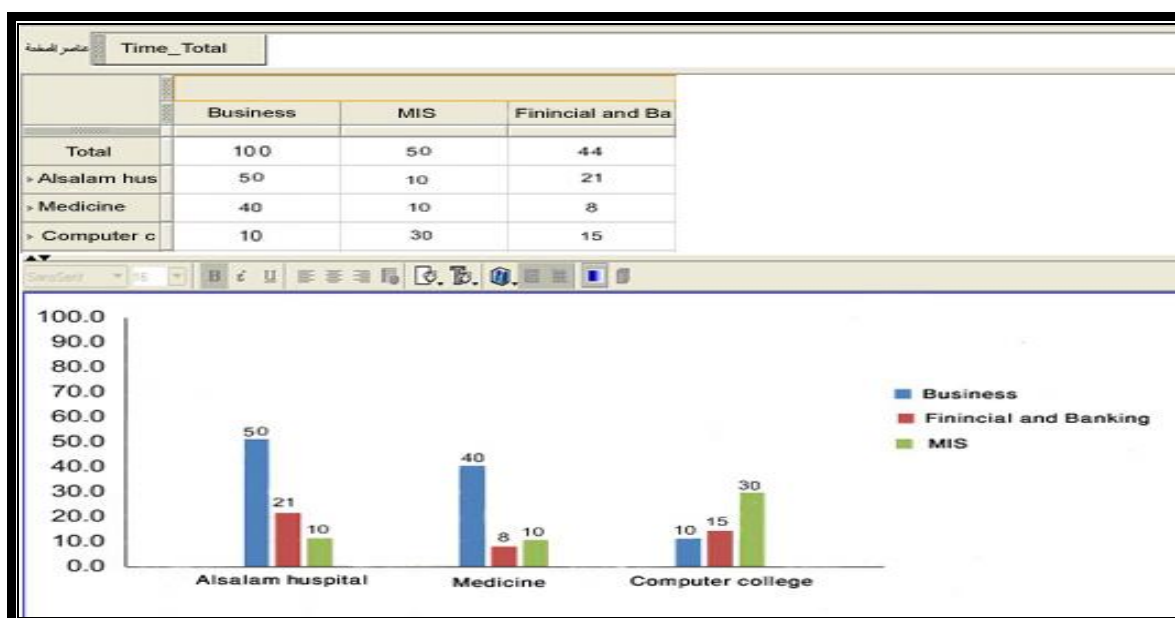
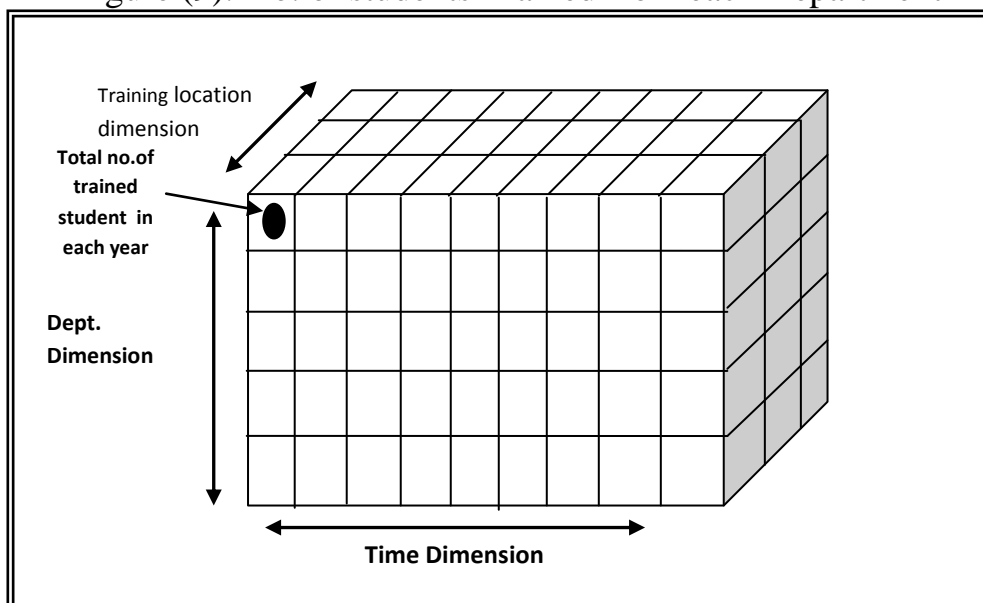


Figure (9): no. of students Trained from each Department



Figure(10) Data Cube

3.4 Apriori & Predictive Apriori Association rule Results

- Paragraphs 1.1,1.2,1.3,1.4 as shown in the Appendix (2) represent the result using Apriori Association Rule , this is used in the placement of students in the organization , As we increase the lower support bound , We get the refined rule as shown in these paragraphs , The rules were evaluated based on the confidence and support the best rule were chosen when confidence is 90% and the support also shows 10% good support .
- Paragraph 2 in the Appendix (2), represented result using predictive Apriori association rule algorithm, This predictive accuracy is used to generate the Apriori association rule , the best rules accuracy start at 0.99329 and decrease to 0.62506.

4. CONCLUSION AND FUTURE WORK

1-Upon examining table (1), we found that Apriori Algorithm could generate patterns that are believed to be the factors that effect the matching processing process, the data has been grouped into two groups based on the organization category , example of pattern extracted are :

If student are from the Accounting or from Banking or Mis Department and their Average between 66-70 and Sex=female and their place in the left side of Mosul then the students were placed in Alsalam Hospital in a Government Organization.

If student are from the Mis Department and their Average between 76-80 and Sex=male and their place in the right side of Mosul then the students were placed at the college of computer science in an Government Organization.

If student are from the Admin or from Banking or Mis Department and their Average between 71-75 and Sex=female and their place in the right side of Mosul then students were placed in Medicine in a Private Organization.

Table (1): rule generated based on Organization Category

Organization	Region	Criteria (Apriori)
Government	Alsalam Hospital	Major=Accounting & Banking & Mis Average=66-70 female=y SIDE=Left
Government	College of Computer Science	Major=Mis Dept. Average=76-80 male=y SIDE=right
Private	Medicine	Major=Admin & Banking & Mis Average=71-75 female=y SIDE=RIGHT

2- At this stage , we try to compare the two association rule algorithm in predicting the student placement in the organization , Apriori Association rule and Predictive Apriori Association rule , we need the algorithm where the Association rules consist of “Government” and “Private” , so we compare these results using these two Association rule algorithms and we found that the Apriori Association rule algorithm performed best with confidence based ranking and predictive Apriori had performed better on accuracy based ranking .

3- The data warehouse provides a display for the results of inquiries in multiple formats through tables and charts for data.

4- The use of analytical processing tools, to analyze the data warehouse , allows the possibility of providing relevant reports, highly summarized or highly detailed reports and shows the results through figures and charts.

5- Data warehouse provides summer training information, reports and analyzes of value and quality, as derived data is formatted through construction processes (extraction, transform, and load) before they are loaded into the warehouse database.

6- Future Work include other data mining algorithm in predicating the student placement in organization.

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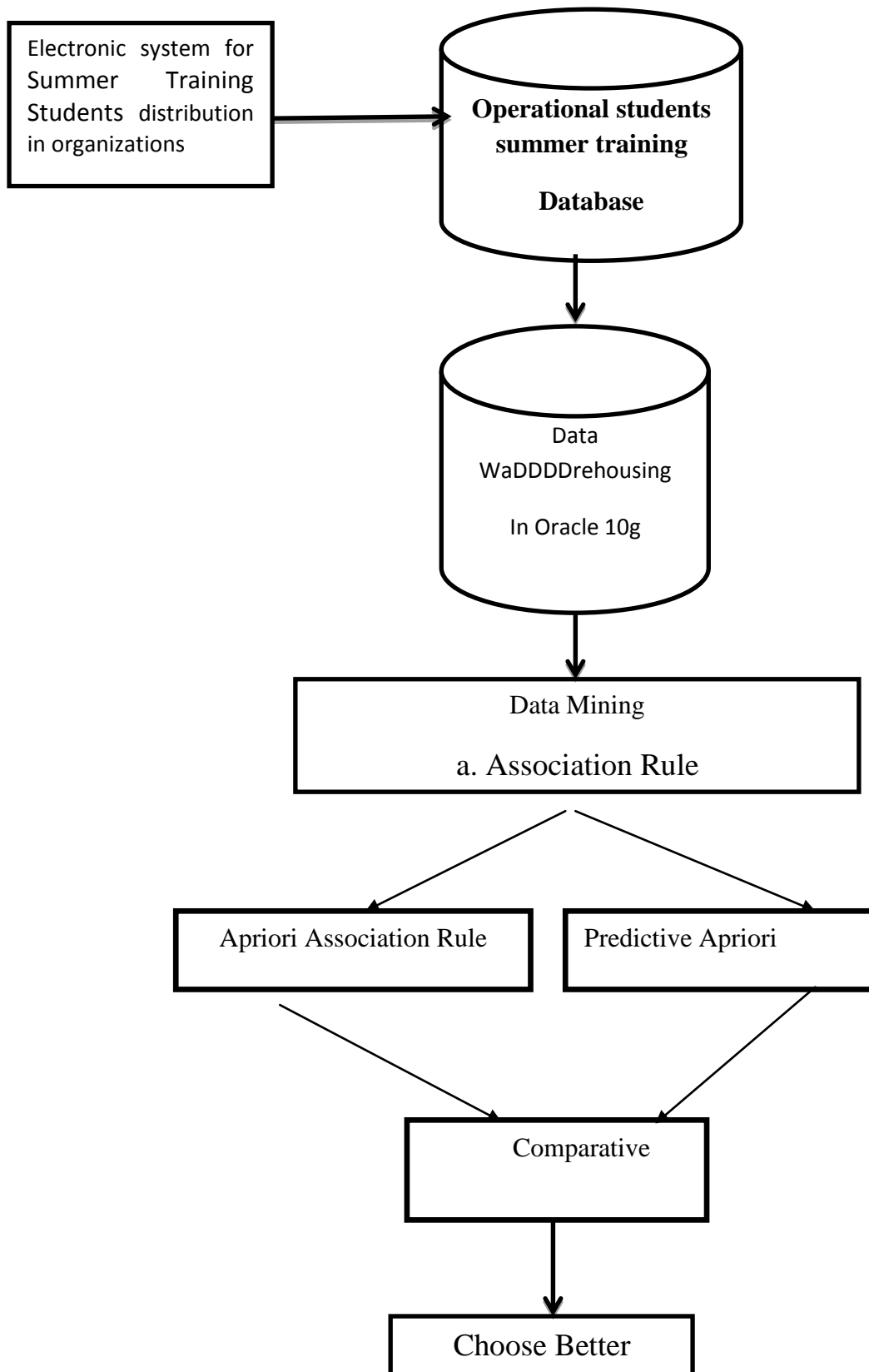
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Appendix(1): Flow Chart of electronic System for Summer Training Students



14. company name=Alsalam Hospital SIDE=LEFT 51
==> class=government 51 conf:(1)
15. company name=Alsalam Hospital desier1=Alsalam
Hospital 51 ==> class=government 51 conf:(1)
16. company name=Alsalam Hospital dept/accounting=y
23==> class=government 23 conf:(1)
17. company name=Alsalam Hospital dept/money=y
20==> class=government 20 conf:(1)
18. company name=Alsalam Hospital dept/mis=y 8==>
class=government 8 conf:(1)
19. company name=medicine female=y 51 ==>
class=private 51 conf:(1)
20. company name=medicine Average=71-75 51 ==>
class=private 51 conf:(1)
21. company name=medicine SIDE=right 51 ==>
class=private 51 conf:(1)
22. company name=medicine dept/Admin=y 30==>
class=private 30 conf:(1)
23. company name=medicine dept/mis=y 17==>
class=private 17 conf:(1)
24. company name=medicine dept/money=y 4==>
class=private 4 conf:(1)
25. company name=college of computer Science male=y
51 ==> class=government 51 conf:(1)
26. company name=college of computer Science
Average=76-80 51 ==> class=government 51 conf:(1)
27. company name=college of computer Science
Side=right 51 ==> class=government 51 conf:(1)
28. company name=college of computer Science
desire2=college of computer Science 51 ==>
class=government 51 conf:(1)
29. company name=college of computer Science Dept/mis
=y 45 ==> class=government 45 conf:(1)
30. company name=college of computer Science
dept/admin=y 6 ==> class=government 6 conf:(1)

<p>Attributes: 16 company name number female male Average Dept/accounti ng Dept/banking Dept/admin Dept/Mis SIDE address SUCCES STAGE/first SUCCES STAGE/secon d desier1 desire2 Class</p>	<p>1.3 Apriori =====</p> <p>1.Minimum support: 0.3 (59 instances)</p> <p>2.Minimum metric <confidence>: 0.9</p> <p>Number of cycles performed: 14</p> <p>Generated sets of large item sets:</p> <p>Size of set of large item sets L(1): 6</p> <p>Size of set of large item sets L(2): 1</p> <p>Best rules found:</p> <p>1. male=y 77 → class=government 77 conf (1)</p> <p>2. SIDE=LEFT 70 → class=government 70 conf (1)</p> <p>3. female=y SIDE=LEFT 68 → class=government 68 conf (1)</p> <p>4. desier1=Alsalam Hospital 65 → class=government 65 conf (1)</p>	<p>1.4 Apriori =====</p> <p>1.Minimum support:0.4 and 0.5 and 0.6 and 0.7 and 0.8 and 0.9</p> <p>2.Minimum metric <confidence>: 0.9</p> <p>No large item sets and rules found</p>
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	2. Predictive Apriori algorithm Rule
Attributes: 16 company name number female male Average	<p>1. male=y 77 ==> class=government 77 acc:(0.99329)</p> <p>2. SIDE=LEFT 70 ==> class=government 70 acc:(0.99295)</p> <p>3. desier1=Alsalam Hospital 65 ==> class=government 65 acc:(0.99264)</p> <p>4. desire2=college of computer Science57 ==> class=government 57 acc:(0.99199)</p> <p>5. company name=Alsalam Hospital 51 ==> class=government 51 acc:(0.99132)</p> <p>6. company name=medicine 51 ==> class=private 51 acc:(0.99132)</p> <p>7. company name=college of computer Science51 ==> class=government 51 acc:(0.99132)</p>
Dept/accounting	<p>8. Average=66-70 51 ==> class=government 51 acc:(0.99132)</p> <p>9. Average=71-75 51 ==> class=private 51 acc:(0.99132)</p> <p>10. Average=76-80 51 ==> class=government 51 acc:(0.99132)</p>
Dept/money	<p>11. female=y SIDE=right 51 ==> class=private 51 acc:(0.99132)</p> <p>12. address=hay alkdsea 41 ==> class=government 41 acc:(0.9896)</p>
Dept/admin	<p>13. SIDE=right desire2=medicine 38 ==> class=private 38 acc:(0.98884)</p>
Dept/mis	<p>14. company name=Cement Plant 27 ==> class=government 27 acc:(0.98415)</p>
SIDE	<p>15. Average=50-100 27 ==> class=government 27 acc:(0.98415)</p>
address	<p>16. female=y desier1=medicine 26 ==> class=private 26 acc:(0.98348)</p>
SUCCESS	<p>17. address=hay alsuger 23 ==> class=government 23 acc:(0.98103)</p>
STAGE/first	<p>18. desier1=medicine desire2=medicine 17 ==> class=private 17 acc:(0.97302)</p> <p>19. company name=hos.alknsm 16 ==> class=government 16 acc:(0.97101)</p>
SUCCESS	<p>20. Average=50-55 16 ==> class=government 16 acc:(0.97101)</p>
STAGE/second	<p>21. desier1=General Hospital 15 ==> class=private 15 acc:(0.96872)</p> <p>22. female=y address=TALKEF 13 ==> class=private 13 acc:(0.963)</p>
desier1	<p>23. mis=y desier1=Cement Plant 13 ==> class=government 13 acc:(0.963)</p>
desire2	<p>24. SIDE=right address=TALKEF 13 ==> class=private 13 acc:(0.963)</p> <p>25. SIDE=right address=FLFEL 13 ==> class=private 13 acc:(0.963)</p>

class	<p>26. address=hay almuthna 12 ==> class=government 12 acc:(0.95939)</p> <p>27. address=ALHDBAA 12 ==> class=private 12 acc:(0.95939)</p> <p>28. accounting=y desier1=medicine 12 ==> class=private 12 acc:(0.95939)</p> <p>29. address=FLFEL desire2=medicine 12 ==> class=private 12 acc:(0.95939)</p> <p>30. desier1=hos.alknsm 11 ==> class=government 11 acc:(0.95511)</p> <p>31. desire2=factory algazzel alnaseeg 11 ==> class=government 11 acc:(0.95511)</p> <p>32. address=TALKEF desire2=medicine 10 ==> class=private 10 acc:(0.94998)</p> <p>33. SUCCES STAGE/second=SECOND desire2=hos.alknsm 10 ==> class=goverment 10 acc:(0.94998)</p> <p>34. admin=y SIDE=right SUCCES STAGE/first=FIRST 10 ==> class=private 10 acc:(0.94998)</p> <p>35. address=hay albreed 9 ==> class=government 9 acc:(0.94375)</p> <p>36. admin=y desire2=hos.alknsm 9 ==> class=government 9 acc:(0.94375)</p> <p>37. address=BESAn 8 ==> class=private 8 acc:(0.93606)</p> <p>38. desire2=college admin & economic 8 ==> class=government 8 acc:(0.93606)</p> <p>39. accounting=y SUCCES STAGE/second=SECOND desier1=Cement Plant 8 ==> class=government 8 acc:(0.93606)</p> <p>40. address=TALKEF SUCCES STAGE/first=FIRST 7 ==> class=private 7 acc:(0.9264)</p> <p>41. address=FLFEL SUCCES STAGE/second=SECOND 7 ==> class=private 7 acc:(0.9264)</p> <p>42. admin=y SUCCES STAGE/second=SECOND desire2=medicine 7 ==> class=private 7 acc:(0.9264)</p> <p>43. SUCCES STAGE/second=SECOND desier1=Cement Plant 34 ==> class=government 32 acc:(0.91892)</p> <p>44. desire2=office alshaa nignoa 6 ==> class=government 6 acc:(0.91397)</p> <p>45. admin=y address=FLFEL 6 ==> class=private 6 acc:(0.91397)</p> <p>46. admin=y address=badoush SUCCES STAGE/first=FIRST 6 ==> class=government 6 acc:(0.91397)</p> <p>47. desire2=hos.alknsm 18 ==> class=government 17 acc:(0.90963)</p>
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48. accounting=y SIDE=right SUCCES STAGE/first=FIRST 17 ==> class=private 16 acc:(0.90397)
49. desier1=Cement Plant 49 ==> class=government 45 acc:(0.90199)
50. accounting=y address=TALKEF 5 ==> class=private 5 acc:(0.89753)
51. accounting=y address=FLFEL 5 ==> class=private 5 acc:(0.89753)
52. accounting=y address=badoush SUCCES STAGE/second=SECOND 5 ==> class=government 5 acc:(0.89753)
53. admin=y SIDE=right desier1=medicine 5 ==> class=private 5 acc:(0.89753)
54. admin=y SUCCES STAGE/first=FIRST desier1=medicine 5 ==> class=private 5 acc:(0.89753)
55. address=TALKEF 14 ==> class=private 13 acc:(0.88292)
56. address=FLFEL 14 ==> class=private 13 acc:(0.88292)
57. address=hay alarabe 4 ==> class=government 4 acc:(0.87499)
58. address=hay almasarf 4 ==> class=government 4 acc:(0.87499)
59. address=hay alwahda 4 ==> class=government 4 acc:(0.87499)
60. address=hay albaker 4 ==> class=government 4 acc:(0.87499)
61. female=y desier1=Cement Plant 4 ==> class=private 4 acc:(0.87499)
62. SIDE=right address=badoush 4 ==> class=private 4 acc:(0.87499)
63. SIDE=right desire2=Alsalam Hospital 4 ==> class=private 4 acc:(0.87499)
64. desier1=medicine desire2=Alsalam Hospital 4 ==> class=private 4 acc:(0.87499)
65. money=y 44 ==> class=government 39 acc:(0.86957)
66. admin=y SIDE=right 20 ==> class=private 18 acc:(0.86448)
67. mis=y SUCCES STAGE/first=FIRST 20 ==> class=government 18 acc:(0.86448)
68. mis=y 46 ==> class=government 40 acc:(0.85417)
69. SUCCES STAGE/second=SECOND desire2=medicine 18 ==> class=private 16 acc:(0.85069)
70. address=badoush 30 ==> class=government 26 acc:(0.84376)
71. address=hay almshaq 3 ==> class=government 3 acc:(0.84255)

72. address=hay alfalah 3 ==> class=government 3 acc:(0.84255)
73. address=hay domeez 3 ==> class=government 3 acc:(0.84255)
74. address=hay althreer 3 ==> class=government 3 acc:(0.84255)
75. desier1=QAIM hospital 3 ==> class=government 3 acc:(0.84255)
76. desier1=Technical Institute of Nineveh 3 ==> class=private 3 acc:(0.84255)
77. desire2=bank alrasheed/alzhoor 3 ==> class=government 3 acc:(0.84255)
78. mis=y desire2=Alsalam Hospital 3 ==> class=private 3 acc:(0.84255)
79. admin=y desire2=medicine 19 ==> class=private 16 acc:(0.80956)
80. accounting=y SIDE=right 27 ==> class=private 22 acc:(0.79311)
81. number=qqq 2 ==> class=private 2 acc:(0.79259)
82. address=hay alzhoor 2 ==> class=government 2 acc:(0.79259)
83. desier1=office alshaa nignoa 2 ==> class=government 2 acc:(0.79259)
84. desire2=college medicine 2 ==> class=government 2 acc:(0.79259)
85. desire2=Technical Institute of Nineveh 2 ==> class=private 2 acc:(0.79259)
86. admin=y desier1=college medicine 2 ==> class=government 2 acc:(0.79259)
87. SUCCES STAGE/second=SECOND desire2=Alsalam Hospital 2 ==> class=private 2 acc:(0.79259)
88. female=y money=y address=badoush 2 ==> class=private 2 acc:(0.79259)
89. female=y address=badoush SUCCES STAGE/second=SECOND 2 ==> class=private 2 acc:(0.79259)
90. desire2=medicine 49 ==> class=private 38 acc:(0.76471)
91. SUCCES STAGE/second=SECOND 87 ==> class=government 67 acc:(0.76405)
92. admin=y desier1=medicine 6 ==> class=private 5 acc:(0.75355)
93. female=y address=badoush 5 ==> class=private 4 acc:(0.71721)
94. SUCCES STAGE/first=FIRST 108 ==> class=government 77 acc:(0.70909)
95. SIDE=right desier1=medicine 41 ==> class=private 26 acc:(0.6279)
96. admin=y 49 ==> class=government 31 acc:(0.62745)

	<p>97. SIDE=right SUCCES STAGE/first=FIRST 49 ==> class=private 31 acc:(0.62745)</p> <p>98. desire2=Alsalam Hospital 6 ==> class=private 4 acc:(0.62506)</p> <p>99. mis=y SUCCES STAGE/second=SECOND desier1=medicine 6 ==> class=private 4 acc:(0.62506)</p>
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