

Database Audit Trials in Academics

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ABSTRACT

An audit trial in databases is an evidence of all procedures that take place in a system and across a network; it provides an outline of user/system events so that safety measures event can be associated to the action of a species individual or system element. As the Log records provide number of information's that can be analyzed for number of purposes. In this research paper, we will propose a process mining based technique to evaluate audit trials for academics perspective. This paper is inspiration of work based on data mining, and it can be used to analyze the student academic performance analysis in during the academics.

General Terms

Audit trails, academics, databases

Keywords

Audit Trials, Log, Data Mining

1. INTRODUCTION

The Research study in this paper is centered on the field of 'Database Audit Trial'. The basic idea for analysis of business process is to extract knowledge from event logs recorded by an information system. Testing and grading database skills automatically can dramatically reduce teachers' time taken in routine tasks. Essentially it allows students to practice and get meaningful feedback instantly. Perhaps in terms of learning the automatic assessment systems are most powerful at formative assessment, i.e. assessments that supports learning while it happens. Increasingly, researchers have begun to utilize trace methodologies in order to examine the complex temporal patterns of self-regulated learning (SRL) [1].

Automated assessment systems for student database may offer important benefits like instant feedback and consistency of the evaluation, and thus saving substantial time in the evaluation of the assignments. Some studies have also reported [2], [3] that immediate grades generate motivation and enthusiasm among students, although there are indications that this may differ as per various cultural [4].

An Audit Trial, also called audit log, is a security-relevant chronological record, set of records, and destination and source of records that provide documentary evidence of the sequence of activity that have affected at any time a specific operation, procedure or event.

It is record that shows who accessed a computer system and what operation he or she has performed during a given period of time. Audit trial is useful both for maintaining security and for recovering lost transaction. Audit trial can also be used in analyze the practical records of the students during the academics.

2. PROBLEM DEFINITION

In the domain of knowledge extraction and data mining, data analysis is performed. In the Security, medical, engineering and other domain take advantage from data mining and knowledge processing, in all the above given fields the audit trial can also used in academics.

In process mining for extracting knowledge the running process are evaluated and database access and logs are analyzed. Additionally running transaction in any data indicates the user behavior analyses.

Data consumption and using the process mining previously used as data processing, but the performance of this architecture is suspicious due to variable length of processes in different machines. Require to enhance data model and the techniques by which system analyze the log for better understandings.

3. SOLUTION DOMAIN

In the process mining the various methods and various source of data is available such as to evaluate the user behavior we can use the audit log, System log and other but to make an effective analysis require to evaluate the current running transaction and already done records. Following analysis were performed

- From USERID, STATEMENTID and ACTION# we can gather how many percent of queries have successes during this semester by each student. By using Success rate we analyze that the success rate of a particular student during the semester as well performance of entire batch. 69

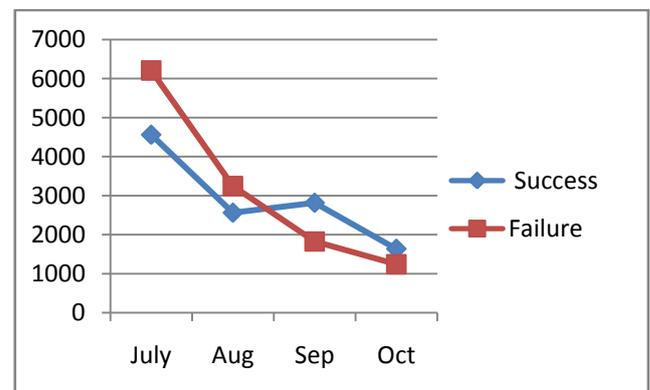


Fig 1: successful versus failure queries

- From TIMESTAMP and STATEMENTID we can gather, during this day (session) which user fire which queries. During a particular day which statement was executed more number of times. This gives us an idea about users level of understanding.

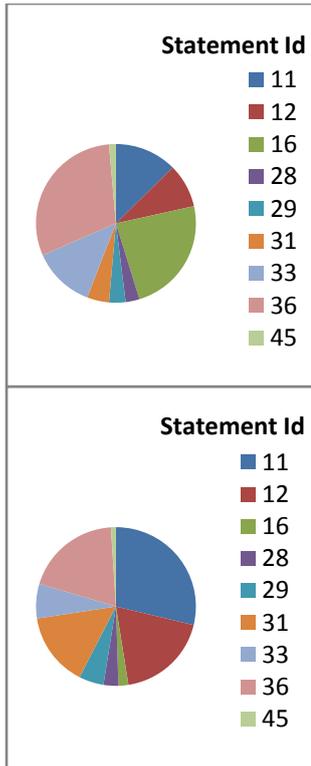


Fig 2: variety of queries run mostly

- From TIMESTAMP, STATEMENTID, ACTION# and RETURN CODE we can get that, during this semester (Time period) which candidate did which query and get how many successful results. By analyzing this we can conclude that which student had how much understanding about the subject. Higher the success rate means higher understandings or more failure conclude as fewer understandings.

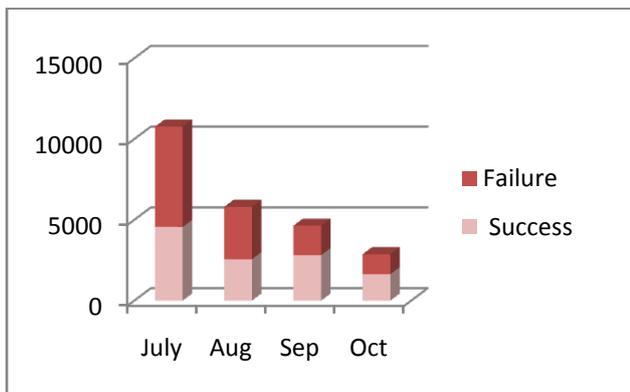


Fig 3: Month wise failure and success of queries

- From STATEMENTID and ACTION# we can get which queries are executed during this day (session). By analyzing this we can conclude that 'Are students doing their task whatever assignments are given to them?' Also we can get that the understandings and difficulties of the students in particular topic.

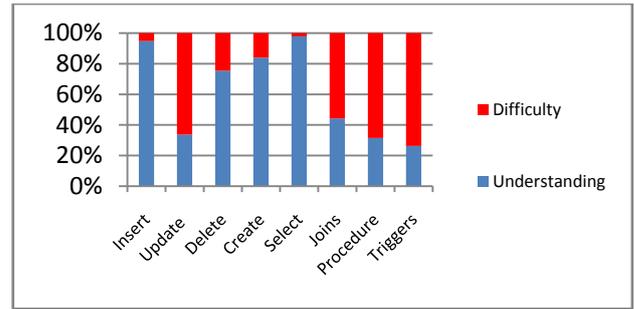


Fig 4: queries run by students

- From USERID and LOGOFF_TIME we can get information on how much time user spends in practical lab. It is also considered as attendance of a student. It also shows that total spend time in practical and also shows effort taken by a student in practical lab.
- From USERHOST, TERMINAL and TIMESTAMP we can get that during this session user working on which local DB(If there are more than one local Databases).

From OWNER, OBJ_NAME, STATEMENTID and ACTION# we can get to know that which Database object (Table) been changed, and also Analyze that which part of table are changed/alterd. By this we also conclude that user is working on his/her own data or trying to use others. It is also use in exam, so teachers can also get user really doing their task or trying to cheat by using some other students created object.

- From SES\$ACTIONS we can get summary of each action been performed during this session.

SES\$ACTION is a string of 16 characters. One string for each action type in the order ALTER, AUDIT, COMMENT, DELETE, GRANT, INDEX, INSERT, LOCK, RENAME, SELECT, UPDATE, REFERENCES, and EXACUTE.

Positions 14-S(Success),15-F(Failure) and 16-B(Both).)

- From LOGOFF_LREAD and LOGOFF_PREAD we can get that number of records which had been logically or physically accessed by the user. It is also assures that users (student) using the perfect (allowable) data during the session or not. LOGOFF_LWRITE get number of records which are been changed during the session.

From all of the above keywords help we can analyze the behavior pattern in the students. And from the behavior pattern of bright student and weak student we can make difference between them and can analyze differences to improve the performance of weak student.

4. TERMINOLOGY USED

Audit Trials: A system that traces the detailed transactions relating to any item in an accounting record. It is also a record of the changes that have been made to a database or file.

Data Mining: The practice of examining large pre-existing databases in order to generate new information.

Logs: A log in a computing context refers to the automatically produced and time-stamped documentation of events as per a particular system. All software applications and systems produce log files virtually.

5. BACKGROUND WORK

Oracle allows auditing to be focused or broad, enabling users to audit the following:

- Successful statement executions, unsuccessful statement executions, or both
- Statement execution once in each user session or once every time the statement is executed
- Activities of all user or of a specific user

All standard audit record is either written in DBA_AUDIT_TRIAL states in **sys.aud\$** table or in to the operating system states in \$ORACLE_HOME/rdbms/audit. At instance startup, an audit is generated that includes the user of the operating system starting the instance, the terminal identifier of the user, and the date and time stamp. This information recorded into the operating system or syslog audit trial is not available only after startup has successfully completed.

6. CONCLUSION

From the new methods of database audit trials analysis we can gather numerous knowledge of a student about his/her academic performance.

7. REFERENCES

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