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Improvement of training students' information profile in the field of databases

The article deals with improvement of training students' information profile in the field of databases. The basic aspects of the use of information technology in the formation of professional competencies of a modern specialist are defined. It has been described the substantial components of the discipline of choice «Programming MS SQL». The focus of the study of this course is given to the development and use of the database.

Key words: training, students, information specialty, database, information technology, professional competences, contemporary specialist, optional discipline, sphere of the development, the language of SQL.

Intensive introduction of information technologies in productions demand from the modern expert of improvement professional competences. For implementation of these requirements the discipline for choice «Programming on MS SQL» is studied by students of information specialties.

The SQL language is standard language of work with databases, gained rather wide circulation. Now practically all largest DBMS developers create the products with use of the SQL language or from the SQL interface. Further extensions of the SQL standard which will include support of the distributed processing, object-oriented programming, multimedia technology elements are planned. The standard existing at the moment is at the same time a subset of realization of language and synthesis of almost all its known realization. The kernel of the standard contains the functions used practically in all commercial realization of language, and a complete standard of the SQL language, includes improvements which many producers still should introduce. In discipline for choice «Programming on MS SQL» questions of design of structure of a database, the main methods of management of a database with use of the structured language of inquiries of SQL are considered, and also the main sections of teams of the SQL language intended for performance of various functions including selection under the terms and modification of data are described. The attention is paid to a problem of ensuring integrity of data: the announcement of restrictions, development of triggers of maintenance of a database in a complete state, creation of transactions and the analysis of levels of blocking. Questions of management of users and data security provision are reflected in its contents. When carrying out laboratory researches with students a large number of the examples realized in the environment of MS SQL Server that promotes development of the basic principles of creation and maintaining a relational database, with use of the SQL language is considered.

The SQL language is the tool intended for selection and the information processing containing in a computer database. SQL is an abbreviation of the structured language of inquiries (Structured Query Language). The abbreviation of SQL is read usually as «sequel», but also the alternative pronunciation «эскьюэль» is used. SQL is a programming language which is applied to the organization of interaction of the user with a database. The Database (D) — the shared set of logically connected data and their description intended for satisfaction of information requirements of the organization. SQL works only with databases of one certain type called by the relational.

In the computing system there is a database in which it is stored important information. If the user needs to receive information from a database, he requests them from DBMS by means of SQL. Computer the program operating a database is called as a control system of a database, or DBMS. In figure the scheme of work of SQL is represented. DBMS processes inquiry, finds the demanded data, sends them to the user.

Process of requesting of data and receiving result is called as inquiry to a database, from here and the name of language — the structured language of inquiries.

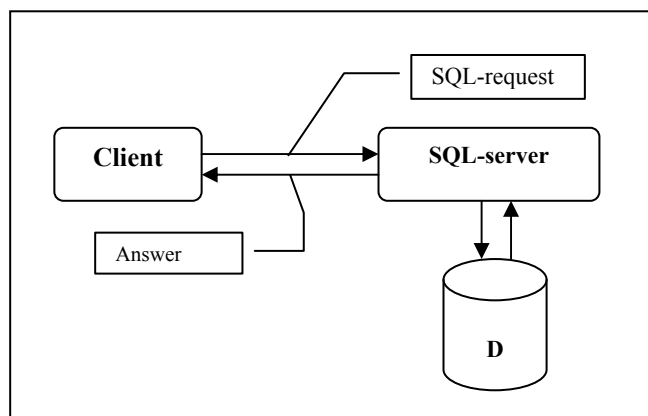


Figure. SQL-server's principle of operation

Today this name not absolutely is true because the SQL language represents something much bigger, than the simple instrument of creation of inquiries though exactly for this purpose it also was intended. Selection of data still remains to one of the most important SQL functions. In modern conditions this language is used for realization of all functionality which DBMS provides to the user:

- Data structure. SQL gives the chance to define structure of data presentation, allows to establish the relations between database elements.
- Selection of data. SQL gives to the user or the appendix opportunity to take the data containing in it from a database and to use them.
- Data processing. SQL gives to the user or the appendix opportunity to change a database: to add to it new data, to delete or update the data which are already available in it.
- Management of access. By means of SQL it is possible to limit possibilities of the user on selection and change of data and to protect them from unauthorized access.
- Sharing of data. SQL coordinates sharing of data by the users working in parallel.
- Integrity of data. SQL allows to provide integrity of a database, protecting it from destruction because of uncoordinated changes or refusal of system.

We will consider sections, advantages and functions of language of inquiries of SQL [1].

SQL is sublanguage of databases which includes about forty instructions intended for management of databases. Instructions of SQL are built in basic language and give the chance to get access to databases. SQL poorly structured language, especially in comparison with such languages, as With, Pascal or Java. SQL at the present stage is the only standard language for work with relational databases.

SQL contains sections:

1. Language of definition of data (Data Definition Language, DDL).
2. Manipulation language data (Data Manipulation Language, DML).
3. Language of inquiries (Data Query Language, DQL).
4. Control facilities transactions.
5. Means of administration of data.
6. Program SQL.

The SQL language possesses the following advantages:

- relational basis;
- independence of concrete DBMS;
- existence of standards;
- cross-platform shipping;
- high-level structure;
- possibility of performance of special interactive inquiries;
- ensuring program access to databases;
- possibility of various data presentation;
- full value as the language intended for work with bases this;
- possibility of dynamic definition of data;
- support of architecture client server;
- support of corporate appendices;

- expansibility and support of object-oriented technologies;
- possibility of access to data on the Internet;
- approval and support by the IBM companies (DB2 DBMS) and Microsoft (SQL Server DBMS, ODBC protocol and ADO technology);
- integration with the Java language (JDBC protocol);
- industrial infrastructure [2].

Now the SQL language is a universal software of a data control, is supported by many tens DBMS of various types and is available to understanding. It carries out many various functions:

- SQL — language of interactive inquiries. Users enter the SQL teams in interactive programs for the purpose of selection of data and their display on the screen. It is a convenient way of performance of special inquiries.

- SQL — a programming language of databases. To get access to a database, programmers insert the SQL programs. It is a technique it is used as in the programs written by users and in office programs of a database (generators of reports).

- SQL — language of administration of databases. The database manager, being on the server, uses SQL for definition of structure of a database and management of access to data.

- SQL — application creation language the client server. In programs for personal SQL computers it is used as means of the organization of communication for a local network with the server of databases in which shared data are stored. The architecture the client server is very popular in applications of corporate level.

- SQL — language of access to data on the Internet. On the SQL Web servers it is used as standard language for access to corporate databases.

- SQL — language of the distributed databases. In control systems of the distributed SQL databases helps to distribute data among several interacting computing systems. The software of each system by means of SQL contacts other systems, sending them requests for access to data.

- SQL — language of locks of databases. In computer networks with various SQL DBMS it is often used in the lock program which allows DBMS of one type to contact DBMS of other type [3].

Thus, the SQL language is the useful and powerful tool providing to users accumulation, access, processing, transfer, storage, representation and use of information containing in relational databases.

The history of creation of the SQL language is closely connected with development of relational databases. In 1970 the concept of a relational database was entered by doctor E.F.Kodd in the article «Relational Model for Big Banks of Shared Data» («A Relation Model of Large Shared Data Banks»), in it the mathematical theory of data storage in a tabular form and their processing was in general stated. Relational databases and SQL originate in this article.

Important step on the way to recognition of the SQL language in the market there was an emergence of standards on this language. At the mention of the SQL standard mean the official standard approved by the American institute of national standards (American National Standards Institute — ANSI) and the International organization for standards (International Standards Organization — ISO).

Using any standards there are numerous and quite obvious advantages and certain shortcomings. Standards direct development of the corresponding industry to a certain course: in case of the SQL language existence of the fundamental principles results in compatibility of its various realization and promotes increase of shipping of the software and databases in general, universality of work of database managers. Standards limit flexibility and functionality of concrete realization. Realization of the SQL language is understood as the SQL software product of the corresponding producer.

All concrete realization of language differs from each other a little, contains the improvements meeting the requirements of this or that server of databases. But it is favorable to producers that their realization conformed to the modern ANSI standards regarding shipping and convenience of work of users. Improvements or expansions of the SQL language represent the additional teams and options which are addition to a standard package and available in this concrete realization.

Thanks to the elegance and independence of specifics of the computer, and also support by leaders in the field of technology of relational databases, SQL became widespread standard language. For this reason, the one who assumes to work with databases soon has to know the SQL language.

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**Мәлімет қорлар аймағында ақпараттық бағыты бойынша
студенттердің дайындығын жетілдіру**

Мақалада мәліметтер қорлармен жұмыс аймағында ақпараттық бағыты бойынша студенттердің дайындауын жетілдіру сұрақтары қарастырылған. Қазіргі мамандардың кәсіптік құзыреттілігін қалыптастыруда ақпараттық технологияларды қолданудың негізгі аспектілері белгіленген. «MS SQL-де программалау» таңдау бойынша пәннің мазмұндық бөлімдері сипатталған. Курсты оқытуда мәліметтер қорын қолдану мен өңдеу сұрақтарына көп көңіл аударылған.

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**Совершенствование подготовки студентов
информационного профиля в области баз данных**

В статье рассматриваются вопросы совершенствования подготовки студентов информационных специальностей в области работы с базами данных. Выделены основные аспекты использования информационных технологий в формировании профессиональных компетенций современного специалиста. Описаны содержательные компоненты дисциплины по выбору «Программирование на MS SQL». Основное внимание при изучении данного курса уделено разработке и использованию базы данных.

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