

WHAT IS DATABASE?

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS). Together, the data and the DBMS, along with the applications that are associated with them, are referred to as a database system, often shortened to just database.

FIELDS:

A database field is a single piece of information from a record. A database record is a set of fields.

The Fields window displays the record-level fields that are contained in a Progeny database.

TYPES OF FIELDS

1. Individual database fields
2. Pedigree database fields
3. Sample database fields
4. Marker database fields

QUERY

A query is a request for data or information from a database table or combination of tables. This data may be generated as results returned by Structured Query Language (SQL) or as pictorials, graphs or complex results, e.g., trend analyses from data-mining tools.

One of several different query languages may be used to perform a range of simple to complex database queries. SQL, the most well-known and widely-used query language, is familiar to most database administrators (DBAs).

The query database feature is equal in necessity to data storage capability. Thus, a number of query languages have been developed for different database engines and purposes, but SQL is by far the most ubiquitous and well-known. In fact,

rookie database administrators often are surprised when they learn about the existence of other query languages.

Query languages generate different data types according to function. For example, SQL returns data in neat rows and columns and is very similar to Microsoft Excel in appearance.

COLUMN

In the context of relational databases, a column is a set of data values, all of a single type, in a table. Columns define the data in a table, while rows populate data into the table.

Most databases allow columns to contain complex data like images, whole documents or even video clips. Therefore, a column allowing data values of a single type does not necessarily mean it only has simple text values. Some databases go even further and allow the data to be stored as a file on the operating system, while the column data only contains a pointer or link to the actual file. This is done for the purposes of keeping the overall database size manageable – a smaller database size means less time taken for backups and less time to search for data within the database.

TABLE

A relational database is made up of several components, of which the table is most significant. The database table is where all the data in a database is stored, and without tables, there would not be much use for relational databases.

OVERALL STRUCTURE OF A DATABASE TABLE

A database consists of one or more tables. Each table is made up of rows and columns. If you think of a table as a grid, the column goes from left to right across the grid and each entry of data is listed down as a row.

Each row in a relational is uniquely identified by a primary key. This can be by one or more sets of column values. In most scenarios it is a single column, such as employeeID.

Every relational table has one primary key. Its purpose is to uniquely identify each row in the database. No two rows can have the same primary key value. The practical result of this is that you can select every single row by just knowing its primary key.

SPREADSHEET

Spreadsheets are computer applications used to store, analyze, organize and manipulate data in the rows and columns of a grid. The program operates by taking in data, which can be numbers or text, into the cells of tables. If the data is numbers, the program will compute it for you depending on the function you need to be completed. Microsoft Excel is currently the industry standard for spreadsheets and worksheets. It is the most used spreadsheet and is available for Windows, MacOS, Android, and iOS. Other programs used include Google sheets, a cloud web-based program, LibreOffice, and several more. The jobs that were once done by accountants are now managed and filed by a computer program for reasons of efficiency and organization. Spreadsheets and computer programs used to optimize data have changed the world for business and data analysis.

FUNCTIONS OF SPREADSHEET

Spreadsheets feature columns and rows to keep inserted information legible and simple to understand. You can use spreadsheets to enter data, calculate equations and create charts and graphs. Spreadsheet software has the capability to create a million rows by 16,000 columns, easily enough space to store large databases of text and data.

COMPUTATIONS

A spreadsheet program can be made to compute a variety of mathematical functions, beginning with addition, subtraction, multiplication and division. You can create relational functions such as greater than, equal than and less than.

STATISTICAL ANALYSIS

Excel can calculate sums, variances and averages of a range of numbers. Creating and analyzing statistical values, such as standard error of the mean and percentile ranks, and variables are additional available functions.

FORMATTING

The spreadsheet software allows cells, rows and columns to expand, merge, be inserted and deleted. This helps when you are using lengthy text and equations. Spreadsheet software also features some of the functions found in word-processing applications, allowing you to format row and column headlines by underlining and changing styles to italic, bold and other text attributes. You can edit font size and color of the data, and center or align the information in the cells.

CELL

Whenever you work with Excel, you'll enter information—or content—into cells. Cells are the basic building blocks of a worksheet. You'll need to learn the basics of cells and cell content to calculate, analyze, and organize data in Excel.

Understanding cells

Every worksheet is made up of thousands of rectangles, which are called cells. A cell is the intersection of a row and a column—in other words, where a row and column meet.

Columns are identified by letters (A, B, C), while rows are identified by numbers (1, 2, 3). Each cell has its own name—or cell address—based on its column and row. In the example below, the selected cell intersects column C and row 5, so the cell address is C5.

ACTIVE CELL

An active cell refers to the currently selected cell in a spreadsheet. It can be identified by a bold (typically blue) outline that surrounds the cell. The standard way to reference the location of an active cell is with a column/row combination, such as A2 (first column, second row) or B5 (second column, fifth row).

Whenever you click on a specific cell within a spreadsheet, it becomes the active cell. Once a cell is selected, you can enter values or a function into the cell. Most spreadsheet programs will display the value of the active cell both inside the cell itself and within a long text field in the spreadsheet toolbar. The text field is helpful for viewing or modifying functions and for editing long text strings that don't fit in the active cell.

ROWS

A row is a horizontal group of values within a table. It contains values for multiple fields, which are defined by columns. Because rows contain data from multiple columns, in databases, each table row may be considered a record.

For example, a row (or record) from a Employee table may contain an employee's name, address, position, salary, and other information. When querying a database, the results are typically returned as an array of rows, which is similar to a group of records. Individual values can be accessed by selecting a specific column (or field) within a row.

WORKBOOK

A workbook is a file that contains one or more worksheets to help you organize data. You can create a new workbook from a blank workbook or a template.

The screenshot displays the Microsoft Excel interface for a workbook named 'Book1'. The ribbon is set to 'Home', and the 'Formula Bar' shows the formula $=SUM(D2:D5)$ for cell D8. The spreadsheet contains a table with the following data:

1	Check number	Date	Description	Amount
2	100	2/23/2015	Water bill	\$45.00
3	101	3/24/2015	Power bill	\$67.00
4	102	4/20/2015	Internet Bill	\$50.00
5				
6				
7				
8		Total:		\$162.00
9		Check Balance:		\$523.00
10		Available:		\$361.00
11				
12				
13				
14				
15				
16				
17				
18				

Annotations in the image include:

- Selected Cell:** Points to cell D8.
- Column header:** Points to the header row (row 1).
- Column:** A vertical red box highlights column H, with a double-headed arrow indicating its extent.
- Column and Row Separators:** Points to the vertical line between columns D and E.
- Row Header:** Points to the header row (row 1).
- Row:** A horizontal red box highlights row 16, with a double-headed arrow indicating its extent.
- Sheet tabs:** Points to the tabs at the bottom of the window.