

What is a Database Management System?

Lecture 06

Basics of DBMS

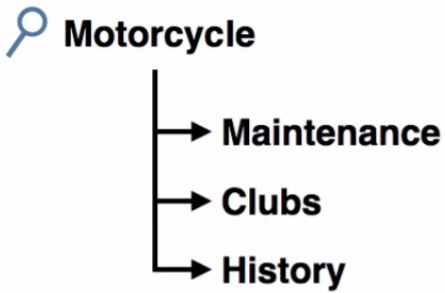
What Is a Database?

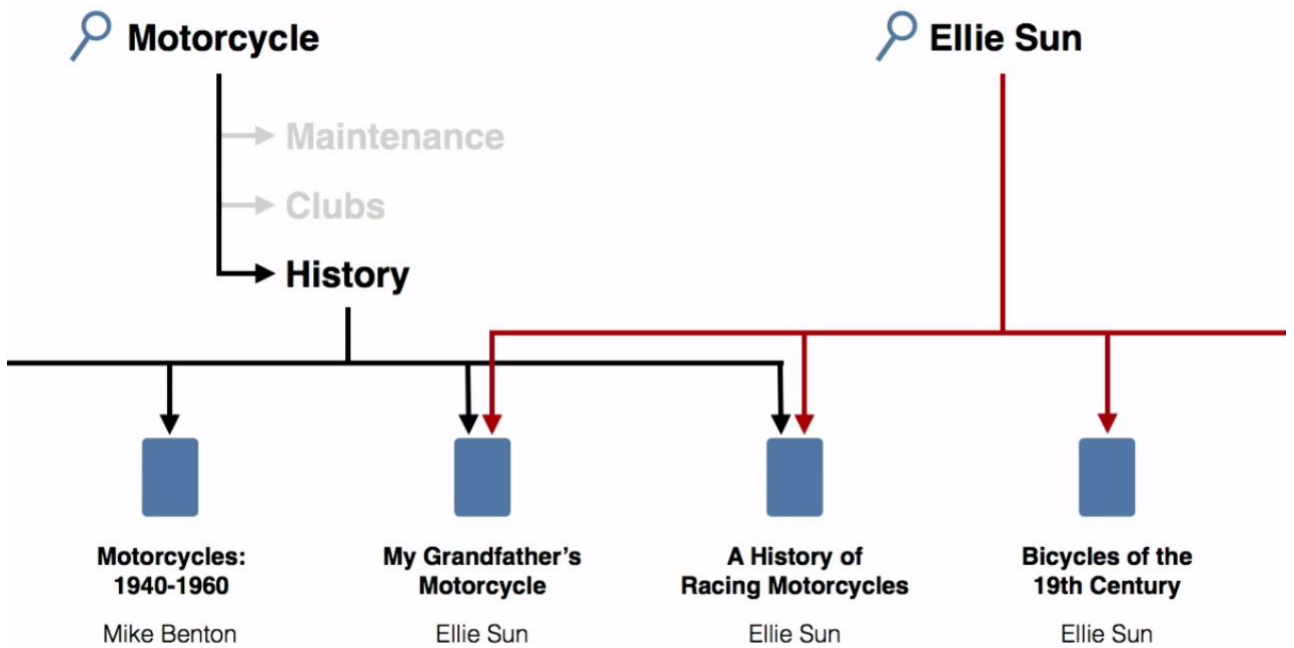
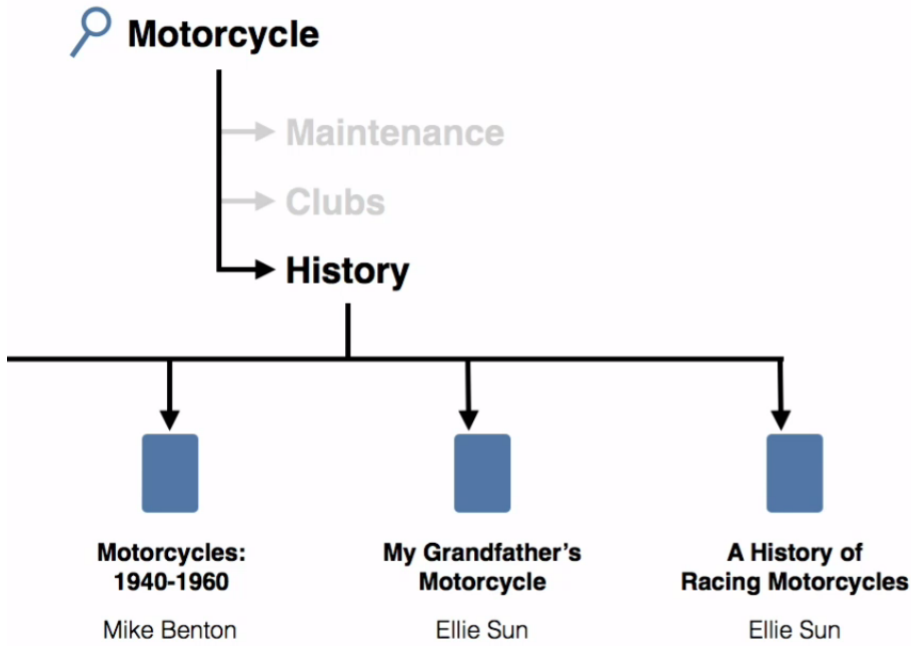
- A collection of individual data items
- Stored in a highly structured way
- Represents a model of reality
- Data can be stored in a single location or hard drive
- Or distributed across large networks

CRUD Tasks

- Create
- Read
- Update
- Delete
- All performed by a database engine

Relational Database Management System (RDBMS)





Understanding the Relational Structure

Tables store data in rows and columns.

Often called relations

Columns

- Attributes
- Values
- Fields
- Store a single piece of information

Rows

- Records
- Made up of a series of values
- Every record in the table has an identical structure
- Each record represents a single entity

The Rules of Relations

- Cells contain single values
- Columns store a single type of information
- Column names are unique
- Order is insignificant
- Rows are unique

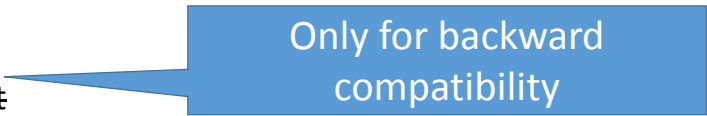
Data Types in MS SQL Server

CHARACTER DATA TYPES

- text
- ntext
- char
- nchar
- varchar
- nvarchar

Character data type

- ~~text~~
- ~~ntext~~
- char
- nchar
- varchar
- nvarchar



Only for backward compatibility

Character data type

Fixed length

Or

variable length

Unicode	or	non Unicode
nchar		char
nvarchar		varchar

CHARACTER DATA TYPES

- Fixed-length character data
 - nchar(10) - 20 bytes, padded with spaces
 - char(10) - 10 bytes, padded with spaces

- Variable length character data
 - nvarchar(10) - it depends, up to 20 bytes
 - nvarchar(4000) - maximum specified length
 - varchar(8000) - maximum specified length
 - nvarchar(max) - up to 2 GB

EXACT NUMBERS

- int -2 billion to 2 billion
- smallint 32,768 to 32,767
- tinyint 0 to 255
- bigint +/- 2^{63}
- money +/- 922,337,203,685,477.5808
- smallmoney +/- 214,748.3648

EXACT NUMBERS

- decimal fixed precision and scale (p,s)
- numeric

decimal(9,2) max value: 9999999.99

DATE DATA TYPES

- date
- time
- datetime
- datetime2
- datetimeoffset
- smalldatetime