Foundations of Computer Science - SQL

1 Introduction to Relational DataBases

The relational DB are organized in tables that can be linked together. A table in the relational model represents a relation. For example in the following database each row describes a single book:

ISBN	**Title**
978-1-449-30321-1	Scaling MongoDB
978-1-491-93200-1	Graph Databases
978-1-449-39041-9	Cassandra: The Definitive Guide
007-709500-6	Database Systems

Table 1: Some sample books

The data in a relational model is organized into columns and each entry(cell) contains a **SINGLE** piece of data, so the main problem of relational model is to handle data with multiple elements in a single column for example a book with two authors.

The solution proposed by the relational model is to link two tables and to do so we need an identifier ID for each row. Here is an example of two linked tables.

book_id	**ISBN**	**Title**
1	978-1-449-30321-1	Scaling MongoDB
2	978-1-491-93200-1	Graph Databases
3	978-1-449-39041-9	Cassandra: The Definitive Guide
4	007-709500-6	Database Systems

Table 2: Books Table with ID

author_id	**Name**	**Surname**
1	Ian	Robinson
2	Kristina	Chodorow
3	Riccardo	Torlone
4	Paolo	Atzeni
5	Stefano	Ceri
6	Stefano	Paraboschi
7	Eben	Hewitt

Table 3: Authors Table with ID

To connect these two tables we use a “relation” or “join” table. In the example the “join” table is the following:

Here we can see the need of using an ID to identify each row. Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each

book_id	author_id
2	1
3	7
1	2
4	4
4	5
4	6
4	3

Table 4: BookAuthors Table

row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.Here we can see the need of using an ID to identify each row.