Introduction to Databases

Q) What is a 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).

The two families of Databases:

1. **SQL (Structured Query language):** Ex) MySQL, PostgreSQL
   - SQL databases store data in a tabular format.
   - Sometimes SQL databases can be extremely inflexible because you will have to have null values in your table if your data doesn't have a value.
   - You can implement relationships between your data by specifying relationships between different tables.
   - Tougher to scale.
2. **NoSQL (Not Only Structured Query Language):** Ex) MongoDB, Redis
   - MongoDB for instance stores data in the form of JSON objects.
   - This allows you to have variable number of key value pairs and eliminates null values.
   - It is difficult to create relationships between your data. In this case, you have to organize your data in different documents and you can link them together through using references.
   - Easier to scale as database can be distributed among lots and lots of computers.

Pros and cons Table:

MySQL	MongoDB
More Mature	Shiny and New
Table Structure	Document Structure
Requires a Schema	More Flexible to Changes
Great with Relationships	Not Great with Complex Relationships
Scales Vertically	Horizontally Scalable