1 | Introduction to Databases

Database Nomenclature

Files	Databases
File	Table
Records	Tuples / Records
Fields	Attributes
Data Items	Values
Key Field	Primary Key

Filing systems

Consider the existence of two files:

- **Employee File**

  This would contain items such as ID number, name, surname, address, email and date of birth.

- **Salary File**

  This would contain items such as hours worked, rates of pay, overtime done, sick leave periods and vacation hours.

To obtain a link between these two files (*i.e binding a salary file to an employee file*) one must repeat all the data manually creating redundancies, duplications, inconsistencies, losses of data integrity, decentralization and, loss of security.

2 | Database systems

To completely omit filing systems, database systems are used instead. These avoid data duplication, redundancy, inconsistency, loss of integrity, insecurity and decentralization.

The *IDE* of databases are called **DBMS**[1].The various types of databases are:

- Flat File
- Relational
- Hierarchical
- Network
- Object Oriented

[1]Data base management system

Flat File Database

Below you can find the `CSV` version of a flat file database and its visual representation.

```
Order, AccountNumber, Name, Address, OrderDate, ItemName, ItemQty, ItemPrice, OrderTotal
12, 3, Peppi, B'kara, 10/2/2021, Pizza, 7, 4.20, 29.40
12, 3, Peppi, B'kara, 10/2/2021, Pasta, 1, 6.90, 6.90
13, 4, Cikku, B'bugia, 11/3/2021, Pomodoro, 3, 1.00, 3.00
```

Order	A/C no.	Name	City	Date	Item	Quantity	Price E.A	Total
12	3	Peppi	B'kara	10/2/2021	Pizza	7	€4.20	€29.40
12	3	Peppi	B'kara	10/2/2021	Pasta	1	€6.90	€6.90
13	4	Cikku	B'bugia	11/3/2021	Pomodoro	3	€1.00	€3.00

First normal form

In this form, the multi-variable categories should be exported in another, separate table.

Order	A/C no.	Name	City	Date	Item	Quantity	Price E.A	Total
12	3	Peppi	B'kara	10/2/2021	Pizza	7	€4.20	€29.40
12	3	Peppi	B'kara	10/2/2021	Pasta	1	€6.90	€6.90
13	4	Cikku	B'bugia	11/3/2021	Pomodoro	3	€1.00	€3.00

Second normal form

All the attributes in the table should be **functionally dependent** on the *primary key*.

Relational Database

The three types of relations can be denoted with the notation that is referred to as *Crow's Foot* notation. Edgar F. Codd invented a set of related tables using normalization rules which include 3 forms:

- 1^{st} normal form
- 2^{nd} normal form
- 3^{rd} normal form