Relational Terminology + Goal: Data Independence + value domain + datatype + set of all possible values? + set of items + relation + set of k attributes + subset of cartesian product over all value domains + tuple + row of elements of relation + cardinality + number of tuples in the relation + rank + number of attributes in the telation + database schema + set of relation schemas and constraints + database + set of actual relations including data + database instance + NULL + value for unknown/missing values +

Special semantics for specific operations, e.g., three-value Boolean logic

```
TRUE OR NULL → TRUE
FALSE OR NULL → NULL
TRUE AND NULL → NULL
FALSE AND NULL → FALSE
```

+

Comparisons

~~WHERE X = NULL~~ → NULL

WHERE X IS NULL

+ primary key + minimal set of attributes to uniquely identify tuples in relation + unique + not null + minimal + foreign key + reference to primary key in another relation + may be NULL + Referential Integrity + may cause errors when deleting, because tuple may be referenced + solutions +

- **Enforcing Referential Integrity**
  - **#1 Error** (default)
  - **#2 Propagation** on request
    - E.g., for existential dependence
  - **#2 Set NULL** on request
    - E.g., for independent entities

```
DELETE FROM Professors WHERE PID=7
```


```
CREATE TABLE Courses (...
   PID INTEGER REFERENCES Professors
      ON DELETE CASCADE);
```

```
CREATE TABLE Courses (...
   PID INTEGER REFERENCES Professors
      ON DELETE SET NULL);
```

+ domain/semantic constraints + constraints of attribute value + unique + not null + between x and y + etc.

[[Database Design]]