Relational Modelling

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What's all this about then?

Databases let us store data in tables!

- But how do you *structure* your data in a table?
- And can we draw pretty doodles based on them?

Relational modelling

Proviso!

Relational modelling is a tool for thinking about how to decompose relationships between things into tables.

- People get fussy about the syntax

Please don't!

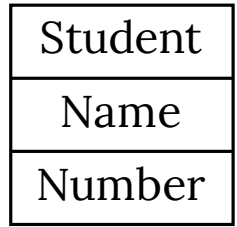
I'll try and show you various syntaxes you may encounter, but its *just a tool*

- Do whatever works for you
- So long as its clear it doesn't matter
- The diagrams are for doodling ideas *not* final implementation

Things are nouns!

Here is a student! Students have a name and a number!

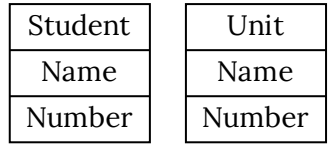
- The student is the *entity*.
- The name and number are the *attributes*.



More things are nouns!

Here is a unit! Units also! have a name and a number!

- The unit is the *entity*.
- The name and number are the *attributes*.



Don’t worry about names

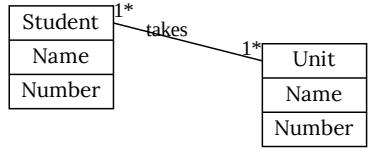
There may be many examples of different *values* that could be examples of units and students… but don’t worry about that.

Student	
Name	Patrick McGoohan
Number	6

Unit	
Name	Software Tools
Number	COMS10012

Nouns can be related!

One student may take many units; and units may have many students



Alternative notation

Some people prefer a graphical notation for entity relationships called *crow's foot*

- I prefer to write it explicitly

Don't get too hung up on notation!

- And use a key if you're ever asked in an exam
- The point is to let *you* doodle notes
- Do whatever makes sense to you or the people you work with

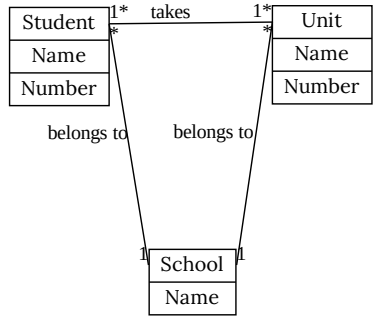
Schools are a thing!

There are things called *schools*:

- Schools have names
- Each unit belongs to *exactly* one school
- Each student belongs to *exactly* one school

Each school can have students and units its responsible for

- But could also be empty!



What should I call a student?

Obviously their name would be *polite*...

...but what will happen if we were to open a class on *Gallifrey*?

All 12!

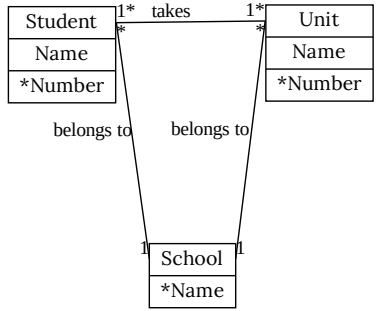
This would rapidly get too confusing for computers!

- (But not for people)

A *key* for an *entity* is the set of attributes needed to uniquely refer to it.

- A *candidate key* is a *minimal* set of attributes needed to uniquely refer to it.
- The *primary key* for an entity is the key we use.

If a key contains multiple attributes its called a *composite key*.
If a key is a meaningless ID column you added just for the sake of having a key its called a *surrogate key*.



When we want to turn it into tables

Every *entity* becomes a *table*

- Each table has a primary key

Every *edge* becomes a table

- Contents of these tables are the *primary keys* of the two items being linked
- Attribute that refers to another key is called a *foreign key*

School Membership

Student	School
6970	School of Computer Science

School Units

Unit	School
COMS10012	School of Computer Science

Student

Name	Number
Joseph Hallett	6970

Unit

Name	Number
Software Tools	COMS10012

School

Name
School of Computer Science

Class Register

Student	Unit
6970	COMS10012