What is a Database?

Computing B

P. Spaelti

Example: an addressbook

Name	Manami
Email	manami@email.com
Birthdate	June 14, 2004
Blood type	A

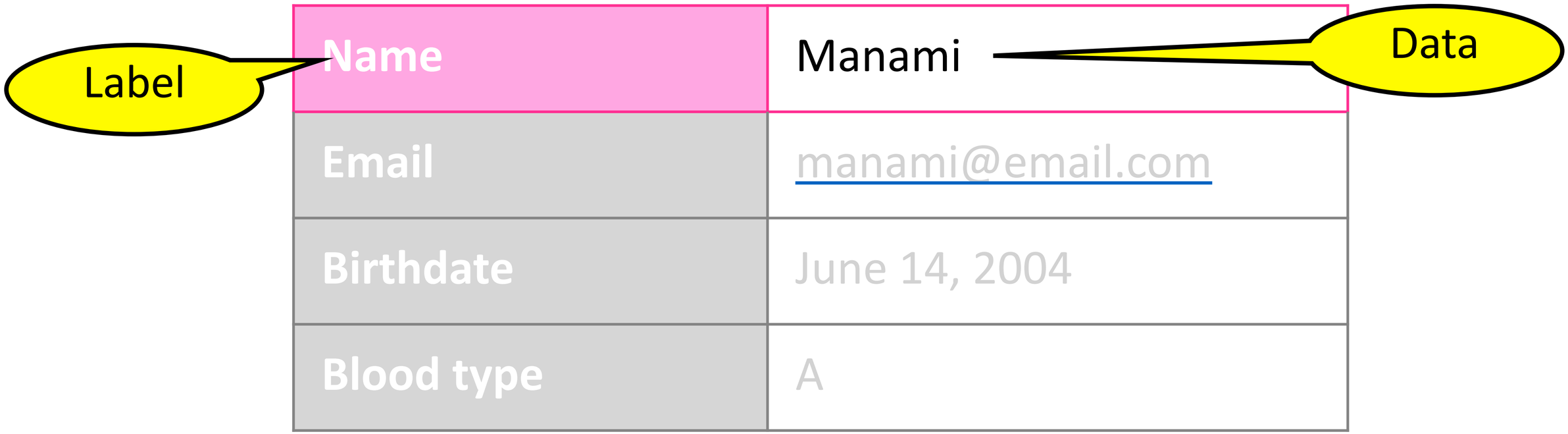
Example: an addressbook

A RECORD: a group of data that belong together

Name	Manami
Email	manami@email.com
Birthdate	June 14, 2004
Blood type	A

Example: an addressbook

A FIELD: a single item from a record with its data contents



Example: an addressbook

In a record each field will contain data with a specific meaning

Name	Manami
Email	manami@email.com
Birthdate	June 14, 2004
Blood type	A

Data Types

- Data has a TYPE
- For example:
  - a name will be of type TEXT
  - an age or a price will be of type NUMBER
  - a birthdate will be of type DATE

Important Note
Date ≠ Data

Data Types: Text

- Written with characters, including
  - alphabet (A, B, C, …)
  - Kanji and kana
  - symbols of all kinds including numbers
- Text can be alphabetized (put in order)

Data Types: Text

Examples

- name: first name, last name, nick name
- address
- email address
- webpage link (URL)
- favorite food, pet, actor, movie, …
- words (as in dictionary)
- … and many other things

Data Types: Number

- Number data is written with numbers/digits
- sometimes we use commas (",") to make them easier to read
- some numbers have a period (e.g. 3.14142…)
- numbers without a period are called integer
- numbers can be added, subtracted, multiplied, …
- numbers can be compared (greater, less, equal)
- numbers often have a unit (kg, cm, ¥, days, [people], …)

Data Types: Number

Examples

- weight
- height
- price
- age (of a person)
- population (of a country)

- NOTE: a phone number is not a number. It's an address written with digits

Data Types: Date

- Dates are written using: Year - Month - Day
- Different languages and countries use different date formats:
  - Japan: Year - Month - Day
  - USA and UK: Month - Day - Year
  - Europe: Day - Month - Year
- We can compare dates (before, after)
- We can calculate the difference between two dates. This difference is a number not a date.

Data Types: Date

Examples

- birthdate
- date when something was bought
- date when an order was made
- etc.

Data Types: Categorical

- Sometimes data allows for only a few choices:
  - Blood type can be: A, B, AB, O
  - A child can be a boy or a girl
  - The language (for a service) might be Japanese or English
- In these cases we can write the data as text, but if we write something that is not one of the choices it will be a mistake
- In such cases it will be good to limit the data to only valid choices

Databases are everywhere

- Internet shopping (Rakuten, Amazon, …)
- Search engines (Google, Bing, Yahoo!, …)
- Social networks (Facebook, LINE, Instagram, TikTok, …)
- Shoin library (… or any other library)
- Manaba
- … and many more