



F7.2 Relational databases

Files and databases · GCSE · OCR J277 2.2.3, AQA 8525 3.7.1 · about 15 min

Name _____

Class _____

Date _____

What this lesson is about

Tables, records, fields, primary and foreign keys, and avoiding redundancy.

- Tables, records and fields
- The trouble with one big table
- Splitting into linked tables
- Keys
- A database in Python
- Following a foreign key

Questions

6 marks in all

- In a database table, what is a record? [1 mark]
 - ☐ A One row: all the data about one item
 - ☐ B One column
 - ☐ C The whole table
 - ☐ D The primary key
- What is a primary key? [1 mark]
 - ☐ A A field whose value is unique for every record in the table
 - ☐ B The first field in any table
 - ☐ C A password for the database
 - ☐ D A field that links to another table
- In the runs table, robot_id holds the primary key of a record in the robots table. What is robot_id in runs? [1 mark]
 - ☐ A A foreign key
 - ☐ B A primary key
 - ☐ C A record
 - ☐ D A table
- Ada's colour is typed into every one of her runs. What is this called? [1 mark]
 - ☐ A Data redundancy
 - ☐ B Data validation
 - ☐ C A primary key
 - ☐ D Normal data

5. Why is storing Ada's colour once, in a robots table, better? [1 mark]
- ☐ A It cannot become inconsistent: changing it once changes it everywhere
 - ☐ B It makes the database slower
 - ☐ C It removes the need for keys
 - ☐ D It hides the colour
6. Why would a robot's name make a poor primary key? [1 mark]
- ☐ A Two robots could have the same name
 - ☐ B Names are too long
 - ☐ C Names cannot be stored in databases
 - ☐ D Names are numbers

The task: runs by robot

Using `logbook.open_db()`, print one line for every run, in run order, in the form `run 1 by Ada: wall 42.0 cm`. Look each robot's name up through the `robot_id` foreign key; do not type the names into your program.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

import logbook

db = logbook.open_db()
```

Plan your program here, then type it in and press Run.



Do it on the robot

www.bugbotlab.com/learn/f7-2-relational-databases/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Add a `tasks` table with a primary key and a description of each task, and make `runs` use a foreign key to it.
2. Which field in `runs` could never be a primary key, and why?
3. Count how many runs each robot did, using the two tables and a dictionary.