Your notes

GCSE Computer Science: revision notes

Relational databases and SQL

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Databases

- A **database** is an organised collection of data. A **relational database** stores its data in several linked tables.
- Each table holds data about one kind of thing, such as students. Each row is a **record**, and each column is a **field**.
- A **primary key** is a **field** that uniquely identifies each **record**, such as StudentID. A foreign key is a field in one table that is the primary key of another table, which links the two tables.

Why use linked tables?

- Each piece of data is stored only once. This avoids **data redundancy** (the same data repeated) and **data inconsistency** (the same data stored differently in different places). A change only needs making in one place.

SQL: finding data

- SELECT Name, Age FROM Students WHERE Age > 15 ORDER BY Name ASC chooses the **fields**, the table, the condition and the order. ASC means A to Z (smallest first) and DESC means Z to A (largest first).
- SELECT * returns every **field**. Conditions can use =, <>, <, >, <=, >=, AND and OR. You may also see LIKE with a wildcard: WHERE Name LIKE 'A%' finds names beginning with A.
- To use two tables, link them in the WHERE clause: SELECT Students.Name, Forms.Room FROM Students, Forms WHERE Students.FormID = Forms.FormID.

SQL: changing data

- INSERT INTO Students (StudentID, Name, Age) VALUES (7, 'Ali', 15) adds a **record**.
- UPDATE Students SET Age = 16 WHERE StudentID = 7 changes a **record**.

- DELETE FROM Students WHERE StudentID = 7 removes a **record**. Always include WHERE, or every **record** in the table is changed or deleted.

Key terms

Database	An organised collection of data.
Relational database	A database that stores data in linked tables.
Record	One row of a table, holding the data about one item.
Field	One column of a table, holding one piece of data about each item.
Primary key	A field that uniquely identifies each record in a table.
Foreign key	A field that is the primary key of another table, linking the two tables.
Data redundancy	The same data being stored more than once.
Data inconsistency	The same data being stored differently in different places.
SQL	Structured query language, used to search and change databases.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is a record in a database table?
2. What is a field in a database table?
3. What is a primary key?
4. What is a foreign key?
5. Why do relational databases use several linked tables?
6. What is data redundancy?
7. Which SQL keyword names the table to use?
8. Which SQL keyword sets a condition?

Answers

1. One row, holding the data about one item
2. One column, holding one piece of data about each item
3. A field that uniquely identifies each record
4. A field that is the primary key of another table, linking the two
5. To avoid storing the same data more than once
6. The same data stored more than once
7. FROM
8. WHERE

What to do next

Practise 12 questions on this topic

Your notes

Try 5 exam questions, with mark schemes

Read the lesson, one step at a time

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