

KK02 — Characteristics of data types, data structures and data sources for input, storage and output

Development & Evaluation · Comprehensive exam study guide

During development you choose **how data is represented and stored**. This builds on Programming KK04–KK06: pick the right data type, structure and file source for each part of input, storage and output, and justify the choice.

Choosing for the job

Decision	Choose based on	Example
Data type	The nature of the value (whole/decimal/text/yes-no/date).	Price → floating point; isPaid → Boolean.
Data structure	How many items and whether they share a type.	Many marks → 1-D array; one student's fields → record; grid → 2-D array.
Data source	How data is stored/exchanged externally.	Tabular records → CSV; nested/portable → XML; free text/log → TXT.

Input → storage → output

Data is often **input** (validated), held in a **structure** in memory, optionally **stored** to a file (TXT/CSV/XML), then **output** to the screen or another file. A consistent choice of type/structure/source across these stages reduces type-mismatch errors and makes the solution efficient.

Key definitions to memorise

Data type	A classification of data (e.g. integer, floating point, string, Boolean, date/time) determining the values it can hold.
Data structure	An organised way of grouping data (e.g. array, record) for storage and access.
Data source	An external store/format for data, such as a TXT, CSV or XML file.

Exam technique

EXAM TIP

- Always justify a choice by the data's nature and how it's used (input/storage/output).
- Refer back to type/structure/source definitions from Unit 3 — they are reused here.

COMMON MISTAKES

- Choosing a structure that mixes data types (use a record).
- Selecting CSV for nested data (use XML).

Quick revision checklist

- I can choose and justify a data type, structure and source for a scenario.
- I can explain how data moves from input to storage to output.

Exam practice — questions & model answers

Q1. A solution stores many students, each with an id, name and fees-paid status. Recommend a data structure and justify it.

Recommend/Justify · 2 marks

Model answer

- An array of records (1),
- because each student needs fields of different types (record) and there are many students (array) (1).

Q2. Justify choosing a CSV file to store a table of exported orders.

Justify · 2 marks

Model answer

- The data is flat/tabular with the same fields per row (1),
- so CSV stores it compactly and it can be opened easily in a spreadsheet (1).