

KK03 — Features of a programming language

Development & Evaluation · Comprehensive exam study guide

STUDY DESIGN — YOU MUST KNOW

- local and global variables and constants
- data types
- instructions and control structures (sequence, selection, iteration/repetition)
- arithmetic, logical and conditional operators
- graphical user interfaces (GUIs)
- functions and methods
- classes and objects
- access modifiers (public, protected and private)

This extends Programming KK08 with **access modifiers**, which control the visibility of class members and are central to encapsulation. Know all the language features and the three modifiers precisely.

Access modifiers

Modifier	Accessible from	Use
public	Anywhere in the program.	The class's intended interface (methods others call).
protected	Within the class and its subclasses.	Members subclasses need but outsiders shouldn't touch.
private	Only within the class that declares it.	Internal data that must be protected (supports encapsulation).

How modifiers support encapsulation

Making data **private** and exposing controlled **public** methods to access it is encapsulation in action: outside code can't corrupt the data directly, it must go through validated methods. This improves reliability and maintainability.

REMEMBER

private = this class only; protected = this class + subclasses; public = everywhere. 'private' is the strictest.

Other language features (recap)

- Local/global variables and constants; data types.
- Control structures: sequence, selection, iteration.
- Arithmetic, logical and conditional operators.
- GUIs; functions and methods; classes and objects.

Key definitions to memorise

Access modifier	A keyword controlling the visibility/accessibility of a class member.
public	An access level allowing a member to be accessed from anywhere.
protected	An access level allowing access within the class and its subclasses.

private

An access level allowing access only within the declaring class.

Exam technique

EXAM TIP

- State the exact visibility of each modifier — these are precise definition marks.
- Link private + public methods to encapsulation for higher-mark questions.

COMMON MISTAKES

- Saying protected means 'only this class' — that is private; protected includes subclasses.
- Confusing access modifiers with scope (local/global) — modifiers apply to class members.

Quick revision checklist

- I can define public, protected and private precisely.
- I can explain how access modifiers support encapsulation.

Exam practice — questions & model answers

Q1. State where a private class member can be accessed.

State · 1 mark

Model answer

- Only within the class that declares it (1).

Q2. Explain how making an attribute private and providing public methods supports encapsulation.

Explain · 2 marks

Model answer

- The private attribute can't be changed directly by outside code (1),
- so all access goes through controlled public methods that can validate changes, protecting the data (1).

Q3. Distinguish between protected and public access.

Distinguish · 2 marks

Model answer

- Protected members are accessible within the class and its subclasses only (1);
- public members are accessible from anywhere in the program (1).