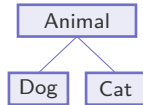


Programming Paradigms

A-Level Computer Science ■ Topic 20

A-Level Computer Science



What we will cover

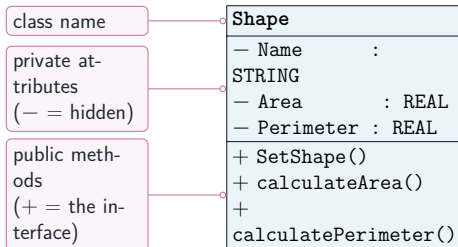
1 Programming paradigms

2 Object-oriented ideas

3 File processing

4 Exception handling

5 Recap

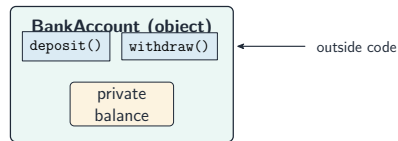


Programming paradigms

Different ways of structuring a program:

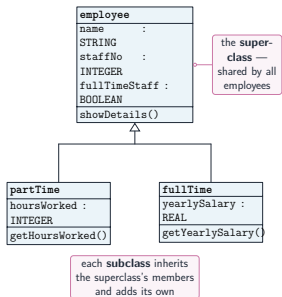
- **procedural** 过程式: sequences of instructions and procedures
- **object-oriented** 面向对象: objects bundling data and methods
- **declarative** 声明式: state **what**, not **how** (SQL, Prolog)

No paradigm is best for everything – pick the one that fits the **problem**.



the data is reached only through the public methods

Object-oriented ideas



- **encapsulation** 封装: hide data behind methods (private fields)
- **inheritance** 继承: a subclass reuses and extends a superclass
- **polymorphism** 多态: the same call behaves differently per object

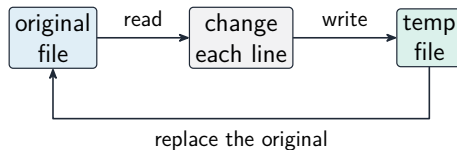
Inheritance models an **is-a** relationship; polymorphism lets one interface serve many types.

File processing

Programs read and write persistent data:

- **text** files – human-readable, portable
- **binary** files – compact, fixed-format records
- always **open**, process, then **close**

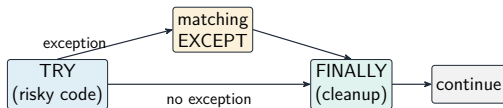
An **update** usually reads the master + a transaction file and writes a **new** master – the old one is the backup.



Exception handling

An **exception** 异常 is a runtime error caught and handled gracefully:

```
try...except...finally
```



- **try** the risky code
- **except** handles a specific error
- **finally** always runs (close the file)

Handle the errors you **expect** (bad input, missing file) – do not swallow the ones that reveal a bug.

Topic 20 – key takeaways

1 Paradigms

procedural, OO, declarative – fit the problem

2 OOP

encapsulation, inheritance, polymorphism

3 Files

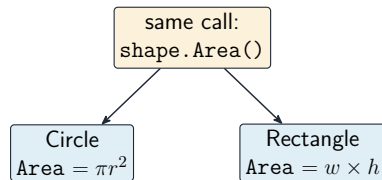
open, process, close; update to a new master

4 Exceptions

try / except / finally

Check yourself

- 1 Which paradigm bundles data with methods?
- 2 Inheritance models which relationship?
- 3 Which block always runs?
- 4 Why write an update to a new master file?



same method name — different code runs

Answers 1. object-oriented 2. is-a 3. finally 4. keeps a backup