Printing + Defaults

Error Codes.

Procedure based languages, older languages correct structures and result in having to create your own error handling procedures. Best avoided.

Most modern languages instead use 'exceptions' exist outside of normal method core return.

'Exceptions' will be looked at in more detail in Programming 2.

'Thrown' by one piece of code; 'caught' and handled by another. The exception has a 'string' which can be printed to explain the exception.

example

If data is null, exception thrown, and 'falls down' through the code core stack to be caught at the bottom of the code at the level at which it is most appropriate to deal with it.

might be used to attempt to access a server, pause 5 seconds, try again, pause 5, try again then give up.

Java API throws many different types of exceptions

Debugging

Early errors usually <u>syntax</u> errors — will be identified by compiler.

Later errors usually <u>logic</u> errors — compiles ok but in use problems arise.

Encapsulating and similar software engineering techniques can lessen likelihood of errors.

To improve chances of detection use modularization and documentation

Method 1 — Unit testing

Method, class,

what should unit do — its 'contract'

<u>Equivalence Classes</u> and <u>Boundary Values</u>
Theme Park example

/	\
18+ member £10	point of change
18+ non-member £20	member/not
5 or below (free) £0	5yrs / 6yrs
6-17 member £6	17yrs/18yrs
6-17 non-member £12	

Unit Testing

Creating a Test Harness to check the code:

Method 2   Manual Walkthrough

underused, low-tech but powerful

Method 3

Verbal walkthrough - explain what each part does helps
you (and the partner) spot errors.

related to Paired Programming - a method from
   Extreme Programming.

Group-based processes for 'inspections' or formal
                                        walkthroughs.

Method 4: Print Statements

Most popular, supported by all languages. May create a
lot of output. Turning on and off can be need forethought.

Good practice to use 'standard error' and 'standard out'

Method 5: Debuggers

   BlueJ and Eclipse have integrated debuggers

Choosing a strategy:

Automate reduces tedium, human error, and you are more
likely to run the tests again since little effort required.