

### Structured programming

**Structured programming** was a term first used by the famous computer scientist Dijkstra in 1968.

Structured programming makes use of the following techniques:

- **Subroutines**
- **Block structures**
- **IF statements** (branching)
- **FOR/WHILE loops** (iteration)

Structured programming does not use GOTO statements to jump to different parts of a program. This is because doing so leads to “**spaghetti code**” where it is very difficult to understand and **debug**.

A structured approach to programming aims to give programs a **logical structure**. This makes them easier to **understand**, **modify** and **debug**.

### Modular programming

When using a structured approach, we try to **decompose** (break down) a program into different **modules** which are used for common functionality. In **imperative languages** these modules will be implemented as **subroutines (functions and procedures)**. In **object-oriented languages**, **objects** are used to **decompose** the problem. A **top-down** approach to problem solving can be used to work out which features of a program will be used in which module of code.

### Comments and documentation

It is very important to **comment** computer code. This helps a programmer when they may have forgotten what a section of code was meant to do. It is also incredibly important for other programmers who need to look at the code and understand it. Comments should be used to explain what **variables** store, **inputs** and **output** of modules or subroutines in the program and to explain how hard parts or algorithms work.

It is important to create **documentation** for a **library** of modules. This will explain how **interfaces** with subroutines and modules are made. It will show how each of the **parameters** are used and what the **return** values are. It will also list **local variables** that are used.

**APIs (Application Programming Interfaces)** are ways in which your program is able to make use of other subroutines. This might be in a computer language (such as Python or C#) or a service (such as Facebook or Twitter).

### Advantages structured programming

Code that has been written with a structured approach is easier to **read**, **update** and **debug**. **Modules** can be **reused** in other programs, **reducing development time**. Modules can be **independently tested**. A structured approach to programming will likely reduce the number of bugs that a programmer creates and make it **easier to debug** code when mistakes have been made.