Unit 6 Software design and development

What is a program?

What is a program?

- A computer is a ‘dumb’ machine. Everything the computer does is in response to program instructions.
- Its processor can obey a fixed set of instructions (e.g. add two numbers together).
- Called the instruction set.
- A program tells the processor what to do.

What is a program?

- Processor instructions are in **binary codes**
- Binary code is very hard for humans to read
- Therefore almost all programs are written in '**High level**' languages
- These have 'English like' instructions rather than binary codes e.g.

Binary Code: 00100110 11001011

High level code: Profit = Sales - expenses

Languages

- Over the 40 or so years that computers have existed many different languages have been created.
- As computer software has become more complex different programming languages and approaches to programming have been developed to help deal with the increasing complexity.

Procedures

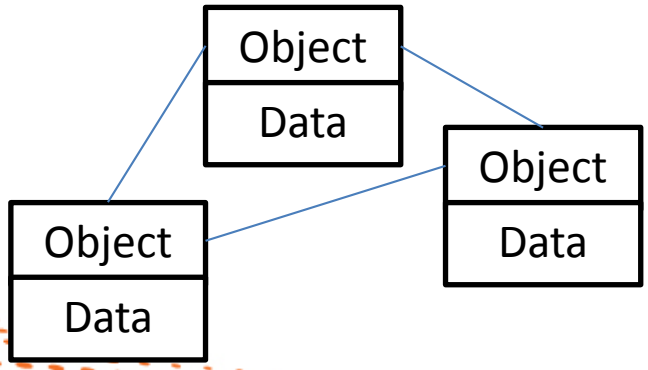
- Most approaches to dealing with the complexity of modern programs involve splitting programs into different sections.
- These are called modules or procedures.
- The procedural approach to programming involves dividing the overall system into different procedures which work together to provide all the required functionality.

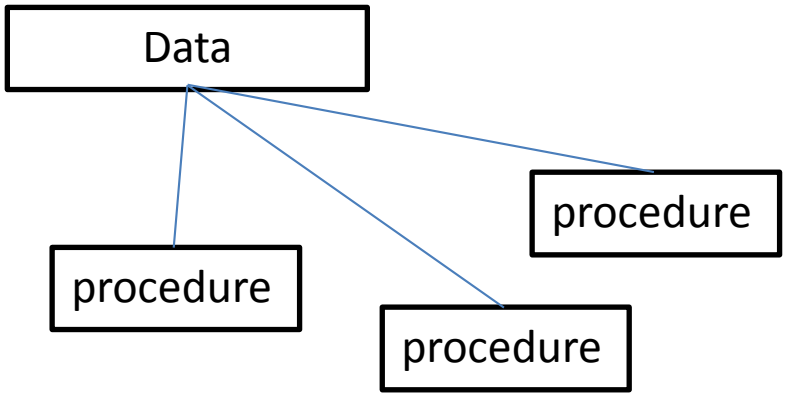
Object orientated

- One problem with the procedural approach is the interaction between the procedures can create too much complexity itself.
- To try to resolve this problem the Object Orientated (OO) approach was developed.
- The OO approach splits a system into objects.
- Objects interact with each other in a different way to procedures.

OO vs Procedural

- Programs consist of instructions and data.
- In the procedural approach the procedures in a system share data.
- In the OO approach the data is 'hidden' inside the object.





Comparison

The procedural approach is good for writing relatively simple programs.

- Its also conceptually simpler so its often used when first learning to write programs.
- However its not such a good approach for developing complex systems.
- The OO approach, while conceptually more difficult to understand is often used for very complex systems.
- The OO approach can be difficult to understand for first time programmers.

Event driven

- The Event driven approach to programming is used in Windows software environments.
- Event driven programs can be written using either the procedural or the OO approach.
- With the event driven approach a program responds to user events such as clicking a menu or button.

Event driven

In an event driven system there are two main parts to the program:

- An event handler which waits for an event to occur. When it does it asks the appropriate event procedure to deal with it.
- Event procedures. These must be created to deal with each event that the program responds to.

Event driven

- The event driven approach is used when creating programs which use the Windows user interface or other GUI.
- It is not suitable for writing programs which don't use the windows user interface.