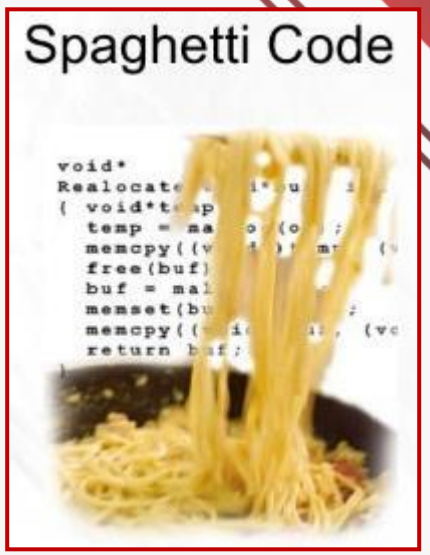
Layered ARCH

Software Architecture



Imagine having a source code file contains 10 thousands lines of code. If you have a bug in this code, how complex is finding the bug … ?

This is what's called the Spaghetti Code, which is the code that unstructured and difficult to maintain.

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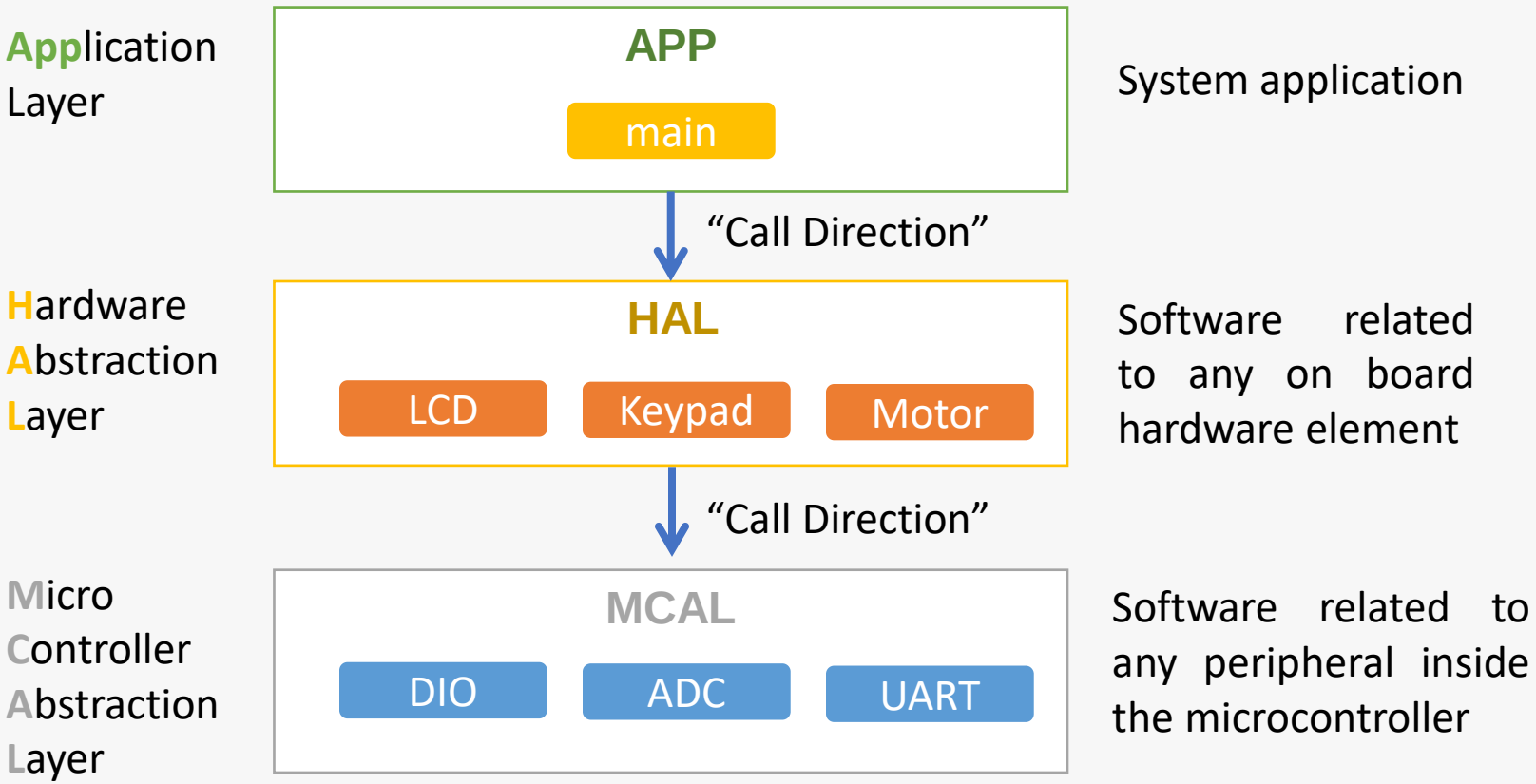
Software Architecture Definition

The software architecture is a structuring way used to define software elements and relationships between them. In Embedded Systems we use a major type of software architecture called Layered Architecture.

In the layered architecture the software is divided into small parts called ***software components*** (SWC). Software components related to each other are organized in a horizontal layer. Each layer is performing a specific role

Embedded Systems Layered Architecture



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Embedded Systems Layered Architecture

Advantages of Layered Architecture

1- Modularity

In a Layered architecture we separate the user application from the hardware drivers from the microcontroller specific drivers.

2- Portability

Changing any part of the software part would change its layer only. For example, if we need the same application with a new microcontroller, we shall only change the MCAL.

Embedded Systems Layered Architecture

3- Reusability

Code could be easily ***reused*** in different applications and systems.

4- Maintainability

Debugging and ***Testing*** is now much easier in small parts of the software instead of having a very long and complex one.

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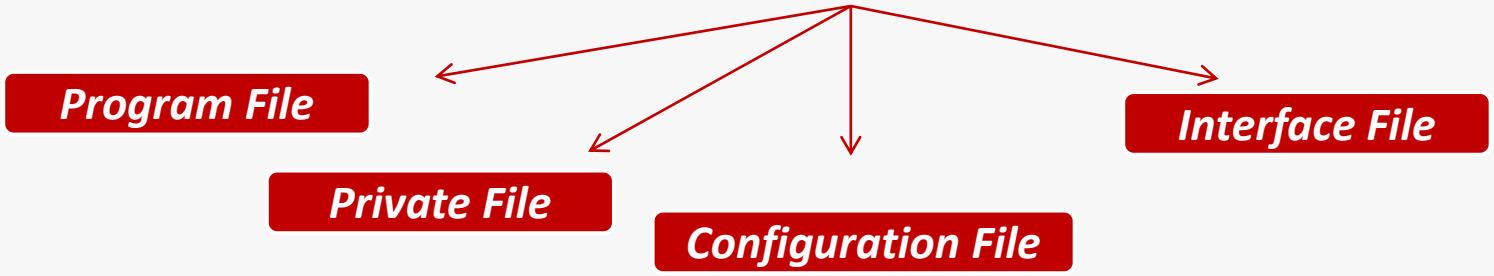
Building DIO Driver

The Simplest driver consists of only 2 files



C file contains the implementations of the functions provided by the driver
ex: DIO_program.c

Private file contains the addresses of the registers of the specified peripheral.
ex: DIO_private.h

Header file contains the prototypes of the functions provided by the driver to be used by other SWCs that need to use this driver
ex: DIO_interface.h

Configuration file contains the configuration choose by the user that the peripheral will work. ***ex:*** DIO_config.h

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THANK YOU!

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