FEC and Registers

L.O.: To understand the role of each register in the FEC

# Registers

* The **control unit** needs somewhere to store details of the operations being dealt with by the fetch-execute cycle.
* The **ALU** needs somewhere to put the results of any operations it carries out.
* There are several storage locations within the processor that are used to store this sort of data.
* They are called **registers**, and although they have a very limited storage capacity, they play a vital role in the operation of the computer.

## Common (Dedicated) Registers

* The **Current Instruction Register (CIR)** stores the instruction that is currently being executed by the processor.
* The **Program Counter (PC)** stores the memory location of the next instruction to be carried out.
  + Each time an instruction is fetched, the value held in the PC is incremented.
* The **Memory Buffer Register (MBR)** a.k.a. the **Memory Data Register (MDR)** holds data that has just been read from or is about to be written to main memory.
* The **Memory Address Register (MAR)** stores the memory location where data in the MBR is about to be written to or read from.

MAR 🡨 [PC]

PC 🡨 [PC] + 1

MBR 🡨 [Memory]

CIR 🡨 [MBR]

[CIR] decoded and executed.

# Interrupts

Interrupts are signals that tell the processor that its immediate attention is needed.

**Vectored Interrupts** are interrupts that contain the memory location of the *interrupt handler*, which is a set of instructions that deal with the interrupt when signalled.