M68000 CPU Architecture

- M68000 is a 16 bit micro-processor developed by Motorola around 1980.
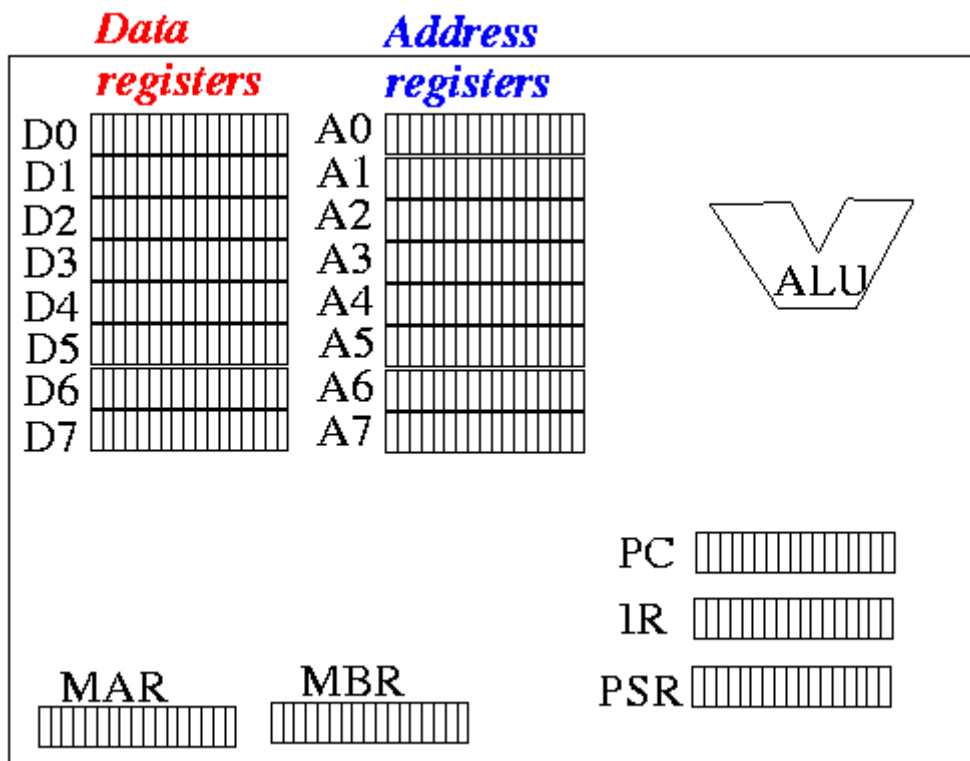
  > - **16 bits** means: the **data bus** has **16 wires**
  >
  >   (Each **data transfer** between **CPU** and **memory** will **transfer 2 bytes** of data)

- Programming in assembler is like "speaking to a machine" and "tell the machine what to do".

  You need to know the **internal details** of the **machine** before you can tell it what to do...

- **M68000** CPU ("machine") **structure:**

- **M68000's** General Purpose **Registers:**

  - 8 **Data Registers**

    > - Their names: D0, D1, D2, D3, D4, D5, D6, D7
    > - Primary usage: store intermediate results of operations

- 8 **Address Registers**

  - Their names: A0, A1, A2, A3, A4, A5, A6, A7
  - Primary usage: store an address in the memory that can be used as the **starting point** to access structured variables in memory.
  - NOTE: register **A7** is **special**: it is the program stack pointer (more later)

- Each (data and address) register has **32 bits**
- The **whole register or** a **portion** of a register can be use as the **operand** in a **machine instruction**