**Type of Pipelining:**

* Software Pipelining

1) Can Handle Complex Instructions

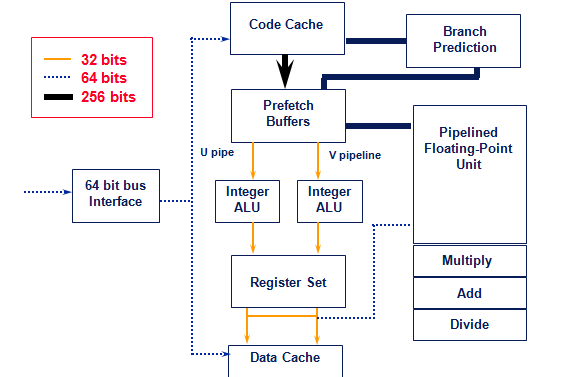
2) Allows programs to be reused

* Hardware Pipelining

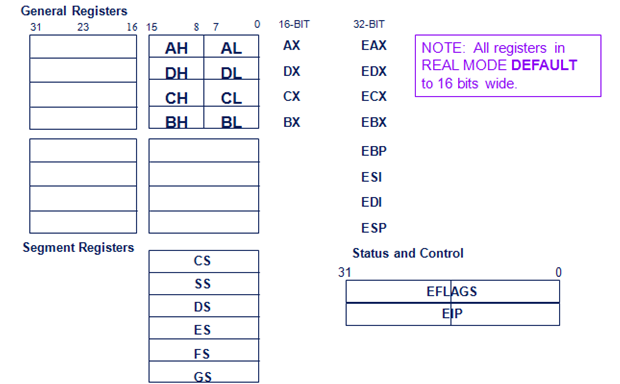
1) Help designer manage complexity – a complex task can be divided into smaller, more manageable pieces.

2) Hardware pipelining offers higher performance

**Pentium processor architecture:**



**Pentium registers:**



Pipelining on the 486/Pentium

* 486 has a 5-stage pipeline
  + Fetch
    - Instructions can have variable length and can make this stage out of sync with other stages. This stage actually fetches about 5 instructions with a 16 byte load
  + Decode1
    - Decode opcode, addressing modes – can be determined from the first 3 bytes
  + Decode2
    - Expand opcode into control signals and more complex addressing modes
  + Execute
  + Write Back
    - Store value back to memory or to register file