**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