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1. How does pipelining improve performance?

Pipelining improves performance by concurrently execution multiple instructions simultaneously, by breaking each instruction into smaller pieces of work and concurrently working on the individual pieces. On modern microprocessors, one of the important end effects of pipelining is to increase the clock frequency, which still being able to execute at the rate of an instruction-every-cycle, thereby increasing performance compared to having no pipelining.

2. What are the three type of hazards in pipelining?

Structural hazards, data hazards, control hazards.

3. What will happen to the processor's performance we have been considering if it had a register file with only one read port.

For all instructions that read two registers we will need to stall in the decode stage by one additional cycle, thereby reducing performance. Lds, stores, and instructions that use an immediate value will not be affected since they need to read only one source register.

