

Dependencies

5 types

-True data dependency - AKA write-read

$$R3 = R1 + R2$$

$$R5 = R3 + 5$$

(cannot complete the second before the first)

-Output dependency - AKA write-write

$$R3 = R1 + R2$$

$$R3 = R5 + 5$$

between the two, there is an intermediate value of R3

the key is to maintain the intermediate values

-Anti-dependency - AKA read-write

$$R3 = R1 + R2$$

$$R1 = R5 + 5$$

-Procedural Dependency

-conditional branch is an example

-branch algorithms don't quite work on a super-scalar machine

-variable instruction lengths

-Resource Conflict

-two instructions requiring the same processor resource

-the effect is the same as a true data dependency