

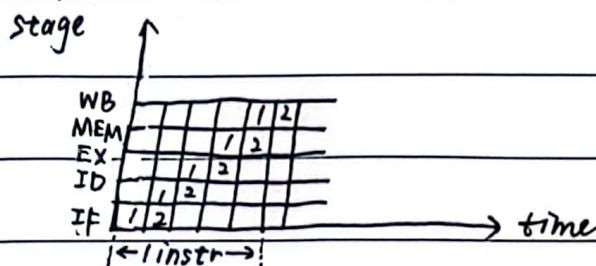
Computer Architecture 复习

Q: Architecture vs Organization?

Performance { SPEC
Dhrystone (INT)
Whetstone (FP)
CPI } 原有程序 (gcc)
人为编写, 专门用于测评

Principle { Parallelism { ILP
superscalar (多 datapath)
pipeline (单 datapath)
Locality → cache (local copy of remote memory)

1. Pipeline



Q₁: Speedup = N (stage)?

Q₂: Balance? (是否可划分 stage)

Q₃: Hazard { structural
Data { True (RAW)
Pseudo (WAW, WAR)
Control

Solution to hazard { HW
SW :

Structural → Duplicate

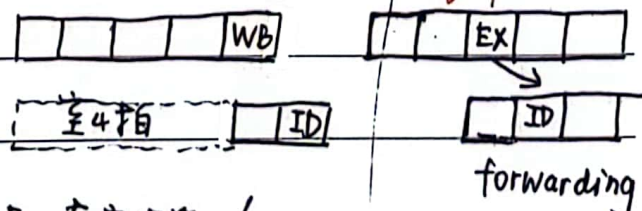
Data { True → Distance

Pseudo → renaming

Control → 填槽 / 等待

(any op change natural seq)

HW i-cache d-cache



另一套寄存器 / Tomasulo