

第7次作业

1. (1) 延时最长的作为 T_{pipe}

视延时可忽略, $T_{pipe} = 2\text{ns}$; 考虑延退, 取 $T_{pipe} = 2.1\text{ns}$ 更为合适

$$(2) \frac{1}{S} = \frac{T_{pipe} \times CPI_{pipe}}{T_{cycle} \times CPI_{cycle}} = \frac{2.1}{7} \cdot \frac{N+4}{N} = 0.3 \frac{N+4}{N} \quad (\text{时间比})$$

加速比 $S = \frac{N}{0.3(N+4)}$

(3) 设分为 K 级

$$\frac{1}{S} = \frac{T_{pipe} \times CPI_{pipe}}{T_{cycle} \times CPI_{cycle}} = \frac{\frac{7}{K} + 0.1}{7} \cdot \frac{N+k-1}{N} = \frac{(7+0.1k)(N+k-1)}{7KN}$$

加速比 $S = \frac{7KN}{(7+0.1k)(N+k-1)}$

当 $k \rightarrow \infty$ 时, 加速比为 0