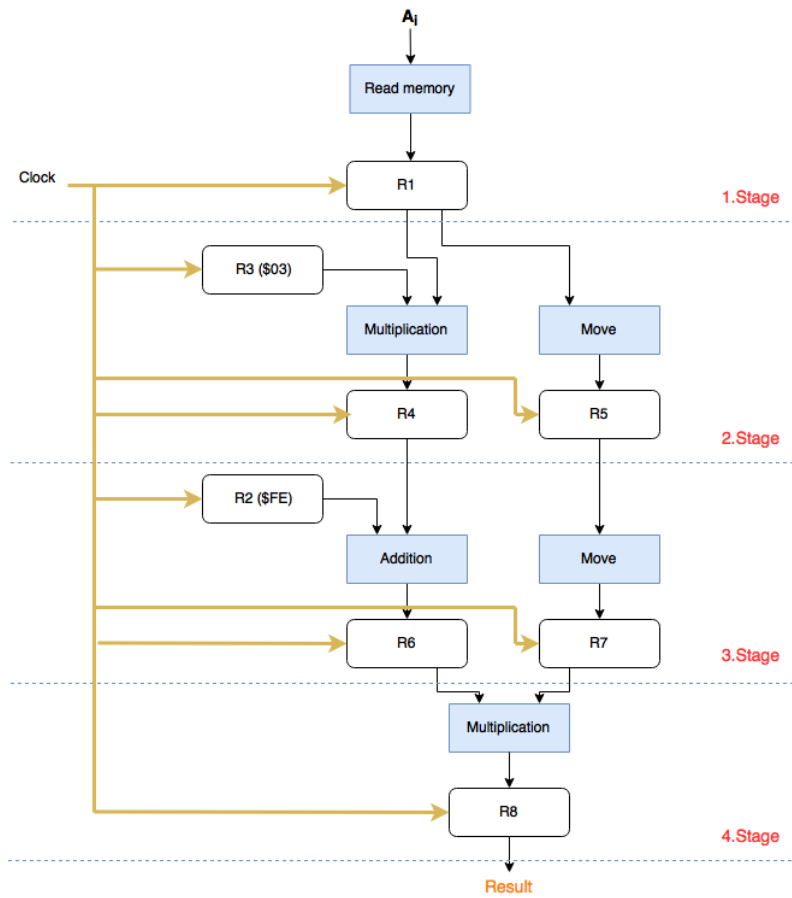


BLG 322E - Computer Architecture Assignment 1

Due Date: 28.02.2018, Wednesday, 16:30

1)



Assumption: R2 has the number \$FE (-2) and R3 has the number \$03 (3) initially.

2)

Speedup:
$$S = \frac{n \cdot t_n}{(k + n - 1) \cdot t_p}$$

$$n \rightarrow \infty, S = \frac{t_n}{t_p}$$

$$t_n = t_1 + t_2 + t_3 + t_4 = 40 + 45 + 15 + 45 = 145ns$$

$$t_p = \max(t_i) + d_r = t_{mul} + d_r = 49ns$$

i) $n = 8 \rightarrow S = \frac{8 \cdot 145}{(4 + 8 - 1) \cdot 49} = 2.1521$

ii) $n = \infty \rightarrow S = \frac{145}{49} = 2.9591$

3) Under assumption $t_n = k \cdot t_p$

$$S_{max} = k = 4 \text{ (Theoretical speedup)}$$