CSE 331
Computer Organisation
Homework 1

1-

Today: cost = $10000, yield = 0.8 , cost of a single chip = x,

$$x = \frac{10000}{120 \cdot 0{,}8} = 104{,}1\overline{6} \cong \$104{,}17$$

4 years later cost:

$10000 \cdot (0{,}8)^4 = \$4096$

4 years later yield:

$0{,}8 \cdot (0{,}9)^4 = 0{,}52488$

for 4 years later: cost = 4096, yield = 0,52488, cost of a... = x,

$$x = \frac{4096}{120 \cdot 0{,}52488} \cong \underline{\$\,65{,}03}$$

2-

Cycle count of A = $(2.50 + 4.10 + 3.2) \cdot 10^6 = 146 \cdot 10^6$

Cycle count of B = $(2.80 + 4.5 + 3.1) \cdot 10^6 = 183 \cdot 10^6$

a) Compiler A is better than compiler B by "n" times since compiler A executes the same program in less cycles than B.

$$n = \frac{\text{cyc. B}}{\text{cyc. A}} = \frac{183 \cdot 10^6}{146 \cdot 10^6} = \underline{1{,}253 \text{ times}}$$

b) 100 ms = 10^{-1} s , clock speed = x,

exec. time = cycle count / clock speed

$10^{-1} = 146 \cdot 10^6 / x \Rightarrow x = 146 \cdot 10^6 / 10^{-1}$

$x = 1{,}46 \cdot 10^9 = \underline{1{,}46 \text{ GHz}}$

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