$T_{serial} = n$ $\quad$ $T_{parallel} = n/p + \log_2(p)$ $\quad$ Efficiency $= \frac{T_{serial}}{pT_{parallel}}$

p increases by facter of k $\quad$ how much to increase n for a constant Efficiency

Given

$E = \frac{T_{serial}}{pT_{parallel}}$

$E = \frac{n}{p(T_{parallel})}$

$E = \frac{n}{p(\frac{n}{p} + \log_2(p))}$

$E = \frac{n}{\cancel{p}\frac{n}{\cancel{p}} + p\log_2(p)}$

$E = \frac{n}{n + p\log_2(p)}$

$E = \cancel{\frac{n}{n}} + \frac{n}{p\log_2(p)}$

$E = \frac{n}{p\log_2(p)}$

$M = p\log_2(p)$

$E = \frac{n}{M}$

Now the problem allows me to select an increase in n. I choose M.

$E = \frac{n \cdot M}{M}$

$E = n$

assuming K is real

problem 2.19 Michael HUG

A) $n \cdot M = p\log_2(p) \cdot n$

Yes this program is scalable, when you consider the book's definition on page 62 "...the program always has an efficiency of E..."

but that is not good enough, our human brains are not setup linearly -> though years of training

www.youtube.com/watch?v=4xfOq00BzJA