

b) $f_1 = 0.1$ $f_p = 0.9$ $p = 2.12$

goal: $S_p = 8$

(i) actual: $S_p = \frac{1}{0.1 + 0.9/24} = 7.27$ (no multi-threading)

$$S_p = 8 = \frac{1}{0.1 + 0.9/n_c} \quad \cancel{p = 2.12}$$

$$= \frac{n_c}{0.1n_c + 0.9}$$

$$0.8n_c + 7.2 = n_c \rightarrow \underline{\underline{n_c = 36 \text{ cores}}}$$

(ii) 36 cores \rightarrow 2 nodes (48 nodes)

$$S_p = \frac{1}{0.1 + 0.9/48} = 8.42$$

(iii) no it doesn't make sense since the speed-up increases from $S_{p1} = 7.27$ to $S_{p2} = 8.42$ for double the number of cores.