3.4) Since any path from a start to a finish cannot be longer than $l$, there must be at least $\frac{t}{l}$ independent paths from start to finish nodes to accommodate all $t$ nodes. Hence $d$ must be $\geq \frac{t}{l}$. If $d > t - l + 1$, then it is impossible to have a critical path of length $l$ or higher because because $l - 1$ more nodes are needed to construct this path. Hence $\frac{t}{ld} \leq d \leq t - l + 1$.

3.15, 3.16) The graphs and dependencies for both problems are similar.

I assume $n=16$ for 3.15.


Iteration goes from $j=0$ to $j=m-1$ i.e. $J=3$


Below figure shows mapping of tasks to processors for above task.

![The butterfly communication structure](image)

Figure 1: The butterfly communication structure