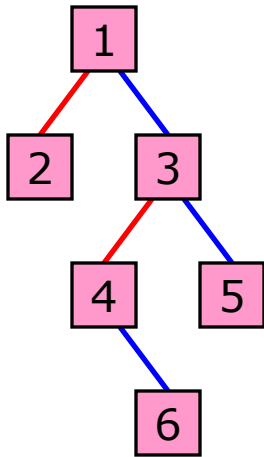


Information for the Final Exam

For Problem 4



The Master Theorem

Suppose $T(n) = a T(n/b) + f(n)$;
 $a \geq 1$, $b > 1$, $f(n)$ is $\Theta(n^d)$.

- $T(n/b)$ means T applied to an integer near n/b .

Then:

- Case 1. If $a < b^d$, then $T(n)$ is $\Theta(n^d)$.
- Case 2. If $a = b^d$, then $T(n)$ is $\Theta(n^d \log n)$.
- Case 3. If $a > b^d$, then $T(n)$ is $\Theta(n^k)$, where $k = \log_b a$.

We may also replace each “ Θ ” above with “ O ”.