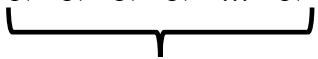


Solving Day #25 ICQ Recurrence

$$T(1) = 1$$

$$T(N) = 2T(N/2) + N$$

Write recurrence using x as the variable: $T(x) = x + 2T(x/2)$

$T(N)$	$= N + 2T(N/2)$	plug N in for x
$= N + 2(N/2 + 2T(N/2/2))$	$= N + N + 4T(N/4)$	plug $N/2$ in for x
$= N + N + 4(N/4 + 2T(N/4/2))$	$= N + N + N + 8T(N/8)$	plug $N/4$ in for x
$= N + N + N + 8(N/8 + 2T(N/8/2))$	$= N + N + N + N + 16T(N/16)$	plug $N/8$ in for x
$= \dots$	$= \dots$	
	$= N + N + N + N + \dots + N * T(N/N)$	
	$= N + N + N + N + \dots + N * T(N/2^k)$	
	$= N + N + N + N + \dots + N * T(1)$	
	$= N + N + N + N + \dots + N$	
		
	$\log_2(N)$	
	because $N/2$ in recurrence	