

1.1).

Base Case: (power call 3 times, $N=1$) $S(1)=3$

1.2).

$$S(N) = 2 + 2S(N/2) + \frac{N}{2} \quad (k=1)$$

$$\begin{aligned} S(N) &= 2 + 2 \left[2 + 2S(N/4) + \frac{N}{4} \right] + \frac{N}{2} \quad (k=2) \\ &= 2 + 4 + 4S(N/4) + \frac{N}{2} + \frac{N}{2} \\ &= 6 + 4S(N/4) + N \end{aligned}$$

$$\begin{aligned} S(N) &= 2 + 2 \left[2 + 2 \left[2 + 2S(N/8) + \frac{N}{8} \right] + \frac{N}{4} \right] + \frac{N}{2} \\ &= 2 + 2 \left[2 + 4 + 4S(N/8) + \frac{N}{4} + \frac{N}{4} \right] + \frac{N}{2} \quad (k=3) \\ &= 2 + 12 + 8S(N/8) + N + \frac{N}{2} \\ &= 14 + 8S(N/8) + \frac{3N}{2} \end{aligned}$$

$$2(N-1) + 2^k S(N/2^k) + \frac{N^k}{2} \quad (\log_2(N) = k)$$

$$2(N-1) + N S(1) + \frac{N \log_2(N)}{2}$$

$$2N - 2 + 3N + \frac{N \log_2(N)}{2}$$

$$5N - 2 + \frac{N \log_2(N)}{2}$$

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