$$T(n) \begin{cases} T(\sqrt{n}) + \log n & n > 1 \\ 1, & n = 1 \end{cases}$$

$n = 2^m$

$T(2^m) = T(2^{m/2}) + \log n$

$T(2^m) = S(m)$

$S(m) = S(m/2) + \log n$

$a = 1 \quad b = 2 \quad f(n) = \log n$

$$T(n) = n^{\log_b a} u(n)$$

$$= n^{\log_2 1} u(n)$$

$$= n^0 u(n)$$

$$h(n) = \frac{f(n)}{n^{\log_b a}}$$

$$= \frac{\log n}{1}$$

$$u(n) = \begin{cases} O(n^r), & h(n)\, n^r \quad r > 0 \\ O(1), & h(n)\, n^r \quad r < 0 \\ \dfrac{\log_2 n^{i+1}}{i+1}\, h(n)(\log n)^i, & i \geq 0 \end{cases}$$

$$n = 2^m$$

$$T(2^m) = T(2^{m/2}) + \log n$$

$$T(2^m) = S(m)$$

$$S(m) = S(m/2) \cdot \log n$$

$$T(n) = n^{\log_b a} u(n)$$

$$= \log_2 n^{0+1} \cdot \log n$$

$$\frac{}{0+1}$$

$$= \log n \cdot \log n$$

$$T(n) = \log n \cdot \log n$$

Substituting back in to earlier eq.

$$T(n) = 2^{\log n} \cdot \log n$$

$$n = 2^m$$

$$T(n) = O(\log \log n \cdot \log n)$$