

1 for n
if n $3n$ ~~18~~ $O(n)$

2 if 1
if n $O(n)$
n

3 if 50%
 n^2 \rightarrow worst case $O(n^2)$

else 50%
for (int i = n-1; i >= 0; i--) \rightarrow $i = i/2$ $\log n$

4 while i <= 60 constant
i++

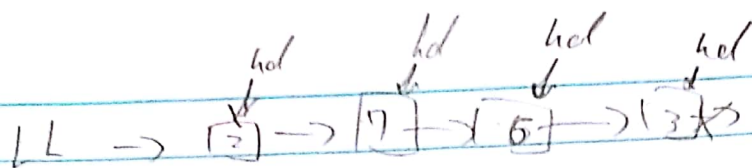
$O(1)$

5 $T(n) = T(n/6) + C$
 $T(\frac{n}{6}) = T(\frac{n}{6} \cdot \frac{1}{6}) + C + C$
 $= T(\frac{n}{6^2}) + 2C$
 $T(\frac{n}{6^3}) = T(\frac{n}{6^3}) + C + 2C$
 $= T(\frac{n}{6^3}) + 3C$

T \downarrow
 $T(\frac{n}{6^j}) + jC$
 \downarrow

$n = 6^j$ $T(1) + (\log_6 n) C$ $O(\log_6 n)$
 $j = \log_6 n$

6



$$\begin{aligned}
 m(hd) &\rightarrow 1 + m_1(hd.next) = 1 \\
 m_1(hd) &\rightarrow m_2(hd.next) = 0 \\
 m_2(hd) &\rightarrow m_3(hd.next) = 0 \\
 m_3(hd) &\rightarrow m_4(hd.next) = 0 \\
 m_4(hd) &\rightarrow 0
 \end{aligned}$$

5

$$SOP(m_4("define", 0, 6)) ?$$

$$\begin{aligned}
 m_1("define", 0, 6) &\rightarrow m_1("define", 1, 5) \\
 m_1("define", 1, 5) &\rightarrow m_2("define", 2, 4)
 \end{aligned}$$

True

6

$$m_5(2018)$$

$$\begin{aligned}
 m_1(2018) &\rightarrow m_1(2018) \\
 m_1(2018) &\rightarrow m_2(1009) \\
 m_3(1009) &\rightarrow m_4(504) \\
 m_4(504) &\rightarrow m_5(252) \\
 m_5(252) &\rightarrow
 \end{aligned}$$