Assignment-1

1. i = n

while i > 2

$i = i^{1/25}$

print i

$n^{\frac{1}{25^k}} = 2$

$\log n^{\frac{1}{25^k}} = \log 2$

$\frac{1}{25^k} \log n = 1$

$\log_2 n = 25^k$

$\log(\log_2 n) = \log 25^k$

$\log_{25}(\log_2 n) = k \log_{25} 25$

$\log_{25}(\log_2 n) = k$

Time Complexity

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

2) $i = 2$

while $(i < n)$

$i = i^{23}$

$2^{23^k} = n$

$\log(2^{23^k}) = \log n$

$23^k \log 2 = \log n$

$23^k \log 2 = 1$

$\log 2 = \frac{1}{23^k}$

$\log(\log 2) = \log\left(\frac{1}{23^k}\right)$

$\log(\log 2) = k \log \frac{1}{23}$

$k = \log_{\frac{1}{23}}(\log 2)$

Time complexity =

$O(\log(\log n))$

3) $i = 1$

while $(i < n)$

$i = 2 * i$

$i = 3 * i$

$i = 6 * i$

$O(\log_6 n)$