Assignment 1

1) $i = n$

while $i > 2$: $\Rightarrow$ $i > 2$ → stopping condition

$i = i^{1/2}$

print(i)

$n^{\frac{1}{2^k}} > 2$

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

$\frac{1}{2^k} \log_2 n = 1$

$i = n^{\frac{1}{2^1}}$

$i = n^{\frac{1}{2^2}}$

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

$\log_2 n = 2^k$

$k \log_2 2 = \log_2 (\log_2 n)$

$k = \log_2 (\log_2 n)$

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

2) $i = 2$

while $i < n$: $\Rightarrow$ $i < n$ → stopping cond^n

$i = i^{23}$

↳ $i = 2^{23}$

$= 2^{23^2}$

$i = 2^{23^k}$

$2^{23^k} = n$

$23^k \log_2 2 = \log_2 n$

$k \log_{23} 23 = \log_{23} \log_2 n$

$k = \log_{23} (\log_2 n)$

$\Rightarrow O(\log_{23} (\log_2 n))$

3) $i = 1$

while $i < n$: $\Rightarrow$ $i < n$

$i = 2 * i$

$i = 3 * i$

$i = 6^1$

6^2

$i = 6^k$

$6^k < n$

$6^k = n$

$k \log_6 6 = \log_6 n$

$O(\log_6 n)$