① i = n
while i > 2 :
    i = i^(1/25)
    print(i)

soln i = n

$n^{(1/25)}$ — 1st step

$n^{(1/25^2)}$ — 2nd step

.
.
.

k-step

$n^{(1/25^k)}$

check condn (i > 2)

$2 = n^{1/25^k}$

taking $\log_2$ on both side.

$\log_2 2 = \log_2 (n^{1/25^k})$

$1 = \frac{1}{25^k} \log_2 n$

$25^k = \log_2 n$

taking $\log_{25}$ on both sides

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

T.C = O[$\log_{25} (\log_2 n)$]

② i = 2y
while i < n :
    $i = i^{23}$

soln i = 2y

$2y^{23}$ — 1st step

$2y^{23^2}$ — 2nd step

.
.
.

$2y^{23^k}$ — kth step

check condn

$n = 2y^{25^k}$

taking $\log_{2y}$ both sides

$\log_{2y} n = 23^k$

taking $\log_{23}$ on both sides

$k = \log_{23} (\log_{2y} n)$

T.C = O($\log_{23} (\log_{2y} n)$)

③ i = 1
while i < n :
    i = 2 * i
    i = 3 * i

soln

i = 6 * i .

n = 64

$2^* i = \log_2 n$

$3^* i = \log_3 n$

T.C = O($\log_6 n$)