

let consider the number $n = \overline{a_{m-1} a_{m-2} \dots a_0}$

of positive number $\leq n$ include

(1) # of positive number created by digits have $\text{length} < m$

(2) # of positive number created by digit have $\text{length} = m$

$$(1) = \sum_{i=1}^{m-1} l^i \quad (l = \text{len}(\text{digits}))$$

$$(2) = k * l^{m-1} + \# \text{ of positive } \leq \overline{a_{m-2} \dots a_0} \quad (\text{if } a_{m-1} \text{ in digit})$$

$$k = \# \text{ of element in digit } < a_{m-1}.$$

So we need to compute # of $\text{len}(m-1) \leq \overline{a_{m-2} \dots a_0}$

let $dp[i] = \# \text{ of positive number } \text{length } i+1 \leq \overline{a_i \dots a_0}$

$$dp[i] = k * l^i \quad (k = \# \text{ of element in } dp[i] < a_i)$$

$$+ dp[i-1] \quad \text{if } a_i \text{ in digits}$$

$$\Rightarrow \text{Answer} = dp[m-1] + \sum_{i=1}^{m-1} l^i$$