1. top-k test:

$x = [0, 1, 2, 3, 30, 31, 32, 33, 34, 35]$

$y \leftarrow topk(x, 6)$

∴ y.indexes is $[10, 9, 8, 7, 6, 5]$

y.probs is $[0.03, 0.23, 0.09, 0.03, 0.01, 0.004]$

2. $y = topk(x, k)$ $x \in R^n$ $k \in N$,

$$y = \begin{cases} indexes \in N^k \\ probs \in R^k \end{cases}$$

Solve: if $k > n$, $k \leftarrow n$.

$U \leftarrow [(1, x_1), \cdots, (i, x_i), \cdots, (n, x_n)]$

$U \leftarrow$ sort $U$ by $U_i(2)$ in descending order

∴ indexes $\leftarrow [U_1(1), \cdots, U_k(1)]$

logits $\leftarrow [U_1(2), \cdots, U_k(2)]$

probs $\leftarrow$ softmax(logits)

∴ $y = \begin{cases} indexes \\ probs \end{cases}$