Radix Sort O(d(n+k))

Assume keys are in $\{0, 1, ..., k^d - 1\}$.

We can think of them as d-digit numbers with digits in $\{0, 1, ..., k - 1\}$.

RADIXSORT

for i = 1 to d:

    stable sort (typically count sort) based on the i^{th} digit

(from the least significant to most significant)

Ex. prove correctness (crucially uses that the sort is stable)

Runtime: $\Theta(d \cdot (n + k))$

As long as d is constant, and $k = O(n)$, runtime is $O(n)$.

For instance, we can sort in linear time if keys are in $\{0, 1, ..., n^{10}\}$.