1. Suppose we have an array $A$ of numbers such that $A[i] = t \sqrt{i}$ for $0 \leq i \leq n - 1$ and some positive number $t$. Show that, using interpolation search, searching for $t$ in $A$ takes $O(\log \log n)$ time.

2. Draw the compressed trie containing the following keys: 10, 101, 1001, 10010, 10011, 1110, 1111, 11100, 111110, 11101.

3. Suppose we have $n$ English words (26-letter alphabet), where the combined length of all words is $\ell$. Give an algorithm to sort the strings in $O(\ell)$ time in lexicographical ordering, e.g., “a” < “ab” < “b”.