Let \((X_k)_{k \geq 1}\) and \((Y_k)_{k \geq 1}\) be two independent sequences of independent identically distributed random variables having the same law and taking their values in a finite alphabet. Let \(LC_n\) be the length of longest common subsequences in the two random words \(X_1 \cdots X_n\) and \(Y_1 \cdots Y_n\). Under assumptions on the distribution of \(X_1\), \(LC_n\) is shown to satisfy a central limit theorem. This is in contrast to the limiting distribution of the length of longest common subsequences in two independent uniform random permutations of \(\{1, \ldots, n\}\), which is shown to be the Tracy-Widom distribution. (Received September 17, 2014)