Non-overlapping codes

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We say that words u and v are overlapping if a non-empty proper prefix of u is equal to a non-empty proper suffix of v, or if a non-empty proper prefix of v is equal to a non-empty proper suffix of u. So, for example, the binary words 00000 and 01111 are overlapping; so are the words 10001 and 11110. However, the words 11111 and 01110 are non-overlapping. A q-ary length n code is non-overlapping if all codewords u and v (not necessarily distinct) are non-overlapping. The basic question is: what is the largest number C(n; q) of codewords of a q-ary non-overlapping code of length n?

Non-overlapping codes were introduced by V.I. Levenshtein in 1964 (under the name `strongly regular code'; in later papers he refers to `codes without overlaps'). There has been recent interest in these codes after they were independently rediscovered by Baji_c and Stojanovi_c. Non-overlapping codes are interesting for synchronisation applications: they are comma-free codes where errors do not propagate indefinitely.

This talk surveys some upper and lower bounds for C(n; q) (the best of which are surprisingly close), and describes a tantalising open problem for binary codes.