Substring Problem

Consider the problem of finding repeated substrings of length m in a string of length n e.g.:

fat.rat.eat.bat.cat.eat.fat.rat

To undertake this problem iteratively, we could take the first substring of m characters from the input string, compare this to each set of characters in the string and note when we get a match. This program has a running time of mn^2, because each character forms one substring, which is compared to each other substring. Thus, it is a quadratic time algorithm; if its input size is doubled, it will take four times as long.