Eric Bronner
CS211 Section 01
pa2b - Mystery Program write-up

The mystery program accepts a string that begins with "Input:" followed immediately by more characters with no spaces. If there are more or less arguments, the program will tell you you do not have the right amount of command line arguments, and if the string does not begin with "Input:", the program will warn you that the format of the input is incorrect. In both cases, the program will exit.

The code takes your string, slices off the "Input:" using sscanf and proceeds to make all prime indexes (with the indexes starting from 1 instead of 0) lower case characters and all even numbered indexes upper case characters, with exception of the second position, because 2 is prime. If the program encounters a '~' character, it will stop changing any future characters.

The program outputs "Output: \"%s\"\n", with %s being the edited-case string.

Of the three functions - main, foo (which edits the strings) and bar (basically isPrime), bar runs in O(n). It divides the given number (an index) by every number between 2 and n-1, unless it finds a number that divides evenly. foo runs in approximately O((n^2/2)+(n/2)) in the worst case: it goes to every character in the string passed in and, for odd numbers and 2 will call bar, which runs in O(n). If the number passed into bar is prime, it will convert the character at that index to lower case. If the index is even, it will be converted to upper case. For cases that are neither even nor prime, it will do nothing. Because it runs the isPrime check on about half the indexes, the function is O(n^2) about half the time, and O(n) for the other half, where n is the number of characters in the string. Main runs in the same time. Other than the call to foo, everything else is O(1).