Searching and Sorting

Substrings and Searching In Strings

1. Have the user enter an arbitrary number of strings, and count how many contain the substring "and" at least once.
2. *Anagrams (version 2.0)*: Recall that anagrams are words with the same letters but in different arrangements, like "cedar" and "raced". Write a program that uses the `count` method to determine if two user-entered strings are anagrams.
3. Have the user enter a string, then determine the index of the *second* occurrence of the letter "a", if it exists in the string.
4. An *n*-digit positive integer is *pandigital* is it contains the digits 1 through *n* in some order. For example, 2143 and 5621374 are pandigital. Read an integer, and determine if it is pandigital.

Searching and Sorting Lists

5. *Animal Game*: In this children's game, two players alternate naming animals. The first player starts with any animal, such as *elephant*. The next player must name an animal that begins with the same letter as the one with which the previous animal ended. Thus, the second player could say *tiger*, then the first could say *raccoon*, and so on. When a player cannot name an animal, s/he loses. Write a program that lets two players plays the Animal Game. Use a list to store previous guesses, so that they cannot be reused. There should be some mechanism by which a player can indicate that s/he gives up, thus ending the game.
6. Read a positive integer, *n*, from the user, then generate a list containing *n* random integers. Determine the mean (average) and median (central value) of the values.
7. In many card games, a *straight* is a sequence of consecutive ranks, such as 2♠3♣4♦5♥6♣. Have the user enter five positive integers into a list, in any order. Determine whether these five values are consecutive. For example, the values 7,8,9,10,11 are consecutive, whereas the values 3,4,5,5,6 and 5,6,9,10,11 are not.
8. *Censored*: Some on-line forums censor inappropriate language by using simple replacement algorithms. For instance, the word "damn" might be replaced by the word "dang" to placate the easily-offended. Create a (polite!) list of words to be replaced in a given string, and a second list containing their replacements, then use both lists to replace all inappropriate words in the string.
9. *CandyLand*: In this game for young children, players move along a trail by drawing cards. Each card contains either one or two coloured symbols, which indicate how many spaces to move. For example, if a player draws a card with a single red symbol on it, s/he moves directly to the next red square on the path. In the case of two symbols, the player moves to the first square of that colour, then proceeds to the next square of the same colour. The game ends when one player reaches the end of the path, which occurs when a player draws a card and there are no more squares of that colour to travel. The game requires no strategy, and is predetermined by the order in which the cards are drawn.
   Write a program that simulates two players playing CandyLand. Create a list containing 102 elements. The first element is the starting position, and the last element is the end position. The remaining 100 elements should be coloured squares, in the order *red*, *green*, *blue*, *yellow*. When it is a player's turn, generate a random colour and move the player to the next square of that colour. In some cases, that player may move two spaces instead of one. When one player reached the end of the path, announce the winner.