SE226 – LAB#6.5 2022-2023 SPRING

Aim: Understanding functions and data structures.

1. Write a Python function that takes two lists of integers as input and returns a new list with only the elements that appear in both lists.

2. Write a Python function that takes a list of strings as input and returns a new list with only the strings that are palindromes.

3. Write a Python function that takes a list of integers as input and returns a new list with the prime numbers in the original list. The function should use the “Sieve of Eratosthenes” algorithm to generate the list of primes from the original list.

   Hint: Instead of marking the “not primes” remove them from the list on each run.

4. Write a Python function called anagrams(word, word_list) that takes a string word and a list of strings word_list as input and returns a new list with only the strings from word_list that are anagrams of word. An anagram is a word or phrase formed by rearranging the letters of another word or phrase, such as "cinema" and "iceman". Your function should use the following approach:

   a. Convert the input word word into a sorted list of characters.
   b. Iterate over the strings in word_list and for each string:
      i. Convert the string into a sorted list of characters.
      ii. Compare the sorted list of characters to the sorted list of characters for word.
      iii. If the two lists are equal, the string is an anagram of word and should be added to the output list.
   c. Return the output list of anagrams.

   For example, if word is "listen" and word_list is ["enlists", "google", "inlets", "banana"], your function should return ["enlists", "inlets"]. Note that the input strings may contain spaces and should be treated as case-insensitive.

5. Do the tasks 1 to 4 again in C++.