

**Lab 07: Arrays**

**CSE 4108**

**Structured Programming I Lab**

October 2023

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**Lab Tasks**

1. **Repeat After Me:**

Write a C program that takes an integer as an input and shows which digits (if any) were repeated.

**Sample input:**

Enter a number: 939577

**Sample output:**

Repeated digit(s): 7 9

2. **Repeating Again:**

Modify the **“Repeat After Me”** program so that the user can enter more than one number to be tested for repeated digits. The program should terminate when the user enters a number that’s less than or equal to 0.

3. **B1FF Translator!**:

You made a friend in the famous social network mySpace, named B1FF. He has a unique way of writing messages. The message length doesn’t exceed 100 characters.

Here’s a typical B1FF communiqué:

**H3Y DUD3, C 15 C00L!!!!!!!!!!**

Write a “B1FF translator” that reads a message entered by the user and translates it into B1ff-speak.

**Sample input:**

Enter message: Hey dude, C is cool

**Sample output:**

In B1FF-speak: H3Y DUD3, C 15 C00L!!!!!!!!!!

Your program should convert the message to upper-case letters, substitute digits for certain letters (A⇒4, B⇒8, E⇒3, I⇒1, O⇒0, S⇒5), and then append 10 exclamation marks.

4. **Caesar Cypher:**

One of the oldest known encryption techniques is the Caesar cipher, attributed to Julius Caesar. It involves replacing each letter in a message with another letter that is a fixed number of positions later in the alphabet. If the replacement would go past the letter Z, the cipher “wraps around” to the beginning of the alphabet. For example, if each letter is replaced by the letter two positions after it, then Y would be replaced by A, and Z would be replaced by B.

Write a program that encrypts a message using a Caesar cipher. The user will enter the message to be encrypted and the shift amount (the number of positions by which letters should be shifted).

**Sample input:**

Enter a message to be encrypted: Smile, it’s Sunnah

Enter shift amount (1-25): 3

**Sample output:**

Encrypted message: Vploh, lw’v Vxqqdk

Notice that the program can decrypt a message if the user enters 26 minus the original key.

**Sample input:**

Enter message to be decrypted: Vploh, lw’v Vxqqdk

Enter shift amount (1-25): 23

**Sample output:**

Decrypted message: Smile, it’s Sunnah

You may assume that the message does not exceed 80 characters. Characters other than letters should be left unchanged. Lower-case letters remain lower-case when encrypted, and uppercase letters remain upper-case.

5. **Anagrams:**

Write a program that tests whether two words are anagrams (permutations of the same letters).

**Sample input:**

Enter first word: smartest

Enter second word: mattress

**Sample output:**

The words are anagrams.

**Sample input:**

Enter first word: dumbest

Enter second word: stumble

**Sample output:**

The words are not anagrams.