Quest 10: SpyHunter

Name of Programmer: Natalia Burbano

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Standard Code

The purpose of this program is to encrypt and decrypt messages. It is limited to a message in all capital letters, without any spaces or additional characters between the letters. The program begins by asking the user whether they want to encrypt or decrypt a message. Then, it asks for a key value that gets stored as an integer. This key will be used as the seed for the random stream of values. In order to strengthen our encryption, the shift value for each letter is different. This shift value will be random for each character in the string, but since rand() returns pseudorandom numbers, if the seed is the same, rand() always returns the same set of random numbers. Therefore, the user can easily decrypt any message as long as they use the same key for when they encrypted their message. Next, the program asks what message the user would like to be encrypted or decrypted. Then, that message is sent to either the encryption or decryption function. The encryption and decryption processes represent two separate functions that only take in a string and return another string.

One of the main challenges of this quest was to assign values of A through Z to corresponding integer values of 0 to 25. This is why I wrote a function called assignVal. In this function, I initialized a string called alphabet to be equal to the entire alphabet in all capital letters. With the help of a for loop, I could assign each character an integer value by comparing each character of the user's inputted string to each character in my alphabet string. Now that each character has a value between 0 and 25, it will have a random value added or subtracted (depending on if the message is being encrypted or decrypted). Finally, I used the modulus operator to ensure I obtained values from 0 to 25 when I sent it back to my changeBack function. The changeBack function then takes in the result of that operation and according to that, will change the new integer value of the letter back to an actual letter. Essentially, it's a very similar process as the assignVal function, but it takes in an integer and returns a character rather than the other way around. Each character will then make up the "newMessage" string that will be returned at the end of the program. The "newMessage" string will either be the encrypted or decrypted string.

Figure 1: Encryption

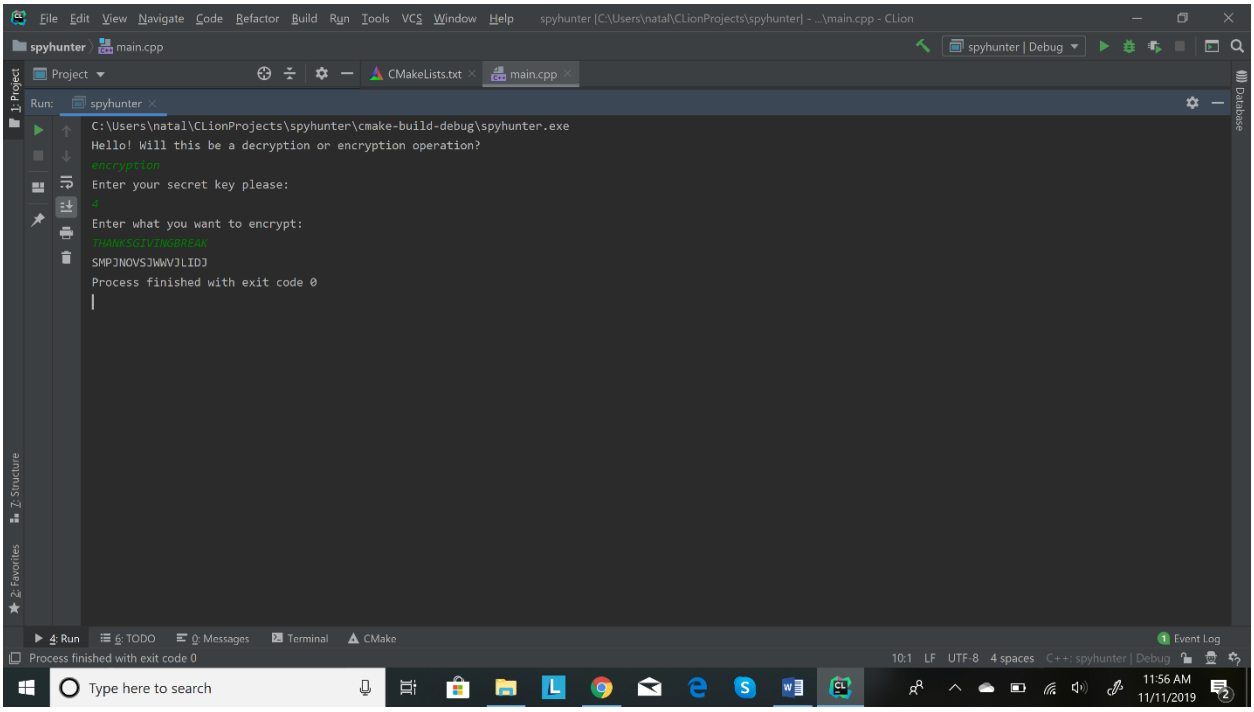

Figure 2: Decryption