Question 6

When I initially came across the prompt for this program I was confused and didn’t really know what to do. I then decided to take a more creative route with what I was going to do. After doing some research and understanding what a Vigenere Cipher is, I began the problem. In this program I declare and set a string called “message” to the phrase “ILOVETOGOTOTHEBEACHWITHMYFRIEND” which is exactly 32 characters long. I did this because we know that the key to this message should be 32 digits, and this is what a Vigenere cipher really does. I chose the keyword “CAR” and rewrote it until it was 32 characters long. The program first encrypts the message using an algorithm for the Vigenere cipher that I discovered from geeksforgeeks.com. My program allows you to set a limit for the number of attempts, this is basically the number of keys that it will generate test against the original key.

The while loop begins by outputting the number of tries the program has attempted so far and has a basic if statement for the limit check. The program calls the generate\_Key passing in the threshold which is really the max number of matches a key has gotten so far. So the function is called and checks if the threshold is less than 5, if it is then the program will generate a random key that is and return that key. If the threshold is above 5, then the key will be mixed (recombination) with the saved attempts. Depending on the threshold, a certain key will be returned. If the z > 5 then the program will create 2 new char arrays and mutate them with already saved tries, this will bring us closer to our solution because we will begin to see more matches. After the key has been generated and returned, the program will test this key in the “try\_key” function. This function will check each character against the original key and store it under the BESTMATCH if the max\_num\_matches variable is less than the counter. If the counter is more than the threshold, the program will perform recombination once again to store this attempt because the number of matches exceeds the threshold. The threshold is increased and so is the number of stored\_tries. The function either returns a 0,1, or 2. It will return a 0 if the key is a complete match, a 1 if the match is good and stored, and a 2 if the math was not good, in other words the matches did not exceed the threshold. Essentially this program is creating more and more random keys and mixing them with previous decent attempts, the program will try to match the original 32 char key, which would be CARCARCAR… It will then decrypt the best attempt and output it.