CIS241 Lab

Bash Scripting

1. Use the tr command to perform encryption and decryption with Caesar ciphers. Command tr (an abbreviation of translate) is to replace or remove specific characters in its input text. As shown below, tr replaces digits ‘0’ to ‘4’ in the input text with lowercase letters ‘a’ to ‘e’, and digits ‘5’ to ‘9’ with uppercase letters ‘A’ to ‘E’, respectively.

   ```
   $ echo “this is a test on 1357” | tr ‘0-9’ ‘a-eA-E’          # a command line
   $ this is a test on bdAC                                     # its output
   ```

   Caesar ciphers are a basic encryption technique in which each letter in the original text is replaced by a letter some fixed number of positions down the alphabet. Here, the fixed number of positions is referred to as the key. For example, if the key is 4, then the mapping between the original and cipher alphabets will be as follows:

   ```
   Original:   A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
   Cipher:     E F G H I J K L M N O P Q R S T U V W X Y Z A B C D
   ```

   Modify the command line with command tr as shown above to perform Caesar cipher with 4 as the key, including both lowercase and uppercase letters (that is, mapping a uppercase letter to another uppercase letter and a lowercase letter to another lowercase letter). Also modify the test data given as part of the echo command in order to test different cases.

   In addition, write a command line to perform decryption. Try your solutions and make sure they work correctly.

2. Change to a directory in which there are a few text files (such as proj1.c) and write a command line to search the directory for files that contain two given keys.

   You can use the grep command to do. As shown below, option –l in command grep is to show filenames (rather than matching lines in a file), the first argument defines the search key, and the second argument specifies the files to be searched. What it does is to search all files in the current working directory for the given key and then display names of those files with that key in them.

   ```
   $ key=”while”
   $ grep –l $key *
   ```

   Since the objective here is to search according to two given keys, you can use the grep command again to search for the second key those files with the first key; that is, the output of the first grep command are used as the files to be searched by the second grep command. Try your solution and make sure it works correctly.

When the command line you created to perform each task described above successfully, copy it to a text file or type it in the note box in Blackboard for submission. If you submit a text file, make sure that its name has the .txt extension.