



## CS161FZ Introduction to Computer Science

### Lab Assignment 6

There are *three* tasks to be completed.

General Information:

- Use variables instead of literals in your programs.

#### Task 1: Cryptography

The Internet is full of threats. Security is one of the major concerns for communication on the Internet. Encryption is one of the effective mechanism used to secure communications contents from hackers. Substitution cipher is of the earliest encryption methods for encrypting messages. The substitution cipher works as follows:

Take each letter of the alphabet and randomly assign it to another letter, for example A -> P, B -> Q, C -> E, etc.

The key for encrypting messages and also decrypting messages would be the alphabet mapped to the new letters. For example a key might be as follows:

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

Use the encryption/decryption key given above, your task is to write a program to decrypt the following message. Your source file should be named “*Cryptography*”.

**p apgp roziopc cjfl spgn zun zo czon ehpfnnf lsn upcn zb lsn fzjoen bkhn puy lsn  
upcn zb lsn ehpf cjl qn lsn fpcn kb mn mpul cptn p apgp roziopc nvnejlpqhn mn  
cjfl rozgkyn p cpku cnlszy lsn cpku cnlszy kf pu kuykeplzo puy p fkiupljon bzo  
apgp gkoljph cpeskun lz bkuy lsn nulox rzkul zb lsn roziopc bzo nvnejlkzu**

## Task 2: PrintVowels

Given a paragraph of text below, write a program to print all the words that contains vowels (a, e, i, o u), in a reversed order the occurrence of the words. Use an empty space to separate the words. You should name your source file as “*PrintVowels*”. (IMPORTANT, only use the methods that we have learned. Do NOT use other methods)

**A Java program must have one or more classes. The name of the source file and the name of the class must be the same. If we want make a Java program executable, we must provide a main method. The main method is an indicator and a signature for Java Virtual Machine to find the entry point of the program for execution.**

**For Example, a part of the expected output:**  
execution for program the of point entry the find ...

## Task 3: Thanksgiving

Write a Java program that: Creates a String that refers to “*These are some treats for your hard works.*” Using relevant String methods:

1. Print the length of the String on a new line.
2. Print the position of the first occurrence of the character 'h' on a new line.
3. Print to the screen the String in all lower case characters on a new line.
4. Print to the screen the String in all upper case characters on a new line.

For practice, save the length and position in integer variables and the strings in new string variables. Then print these variables instead. You should name your source file as “*Thanksgiving*”.