**1.** Write a method removeDoubledLetters that takes a string as its argument and returns a new string with all doubled letters in the string replaced by a single letter. For example, if you call

**removeDoubledLetters("tresidder")**

your method should return the string "**tresider**". Similarly, if you call

**removeDoubledLetters("bookkeeper")**

your method should return "**bokeper**".

**2.** Scrabble scoring: In most word games, each letter in a word is scored according to its point value, which is inversely proportional to its frequency in English words. In Scrabble, the points are allocated as follows:

**Points Letters:**

|  |  |
| --- | --- |
| 1 | A, E, I, L, N, O, R, S, T, U |
| 2 | D, G |
| 3 | B, C, M, P |
| 4 | F, H, V, W, Y |
| 5 | K |
| 8 | J, X |
| 10 | Q, Z |

For example, the Scrabble word **FARM** is worth 9 points: 4 for the F, 1 each for the A and the R, and 3 for the M. Write a console program that reads in words and prints out their score in Scrabble, not counting any of the other bonuses that occur in the game.

You should ignore any characters other than uppercase letters in computing the score. In particular, lowercase letters are assumed to represent blank tiles, which can stand for any letter but which have a score of 0.

**3.** Adding commas to numeric strings.

When large numbers are written out on paper, it is traditional—at least in the United States—to use commas to separate the digits into groups of three. For example, the number one million is usually written in the following form:

**1,000,000**

To make it easier for programmers to display numbers in this fashion, implement a method

**private String addCommasToNumericString(String digits)**

that takes a string of decimal digits representing a number and returns the string formed by inserting commas at every third position, starting on the right. For example, if you were to execute the main program

**public void run() {**

**while (true)**

**{**

**String digits = readLine("Enter a numeric string: ");**

**if (digits.length() == 0)**

**break;**

**println(addCommasToNumericString(digits));**

**}**

**}**

your implementation of the **addCommasToNumericString** method should be able to produce the following sample run:

Output:

Enter a number: 17

17

Enter a number: 1999

1,999

Enter a number: 10000000

10,000,000

**4. Encrypt and Decrypt the enter from the user by assuming below cipher key.**

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

**The second problem for today is to write a program that implements this more general letter-substitution cipher. The program should ask the user to enter a 26-letter key and the plaintext message. It should then display the ciphertext and, to ensure that the encryption is working, what you get if you decrypt the ciphertext using the same key:**

**This program implements a letter-substitution cipher.**

**Enter 26-letter key**: QWERTYUIOPASDFGHJKLZXCVBNM

**Plaintext**: WORKERS OF THE WORLD UNITE

**Ciphertext**: VGKATKL GY ZIT VGKSR XFOZT

**Decryption**: WORKERS OF THE WORLD UNITE

**5.** Deleting characters from a string.

Write a method

**public String removeAllOccurrences(String str, char ch)**

that removes all occurrences of the character **ch** from the string **str**. For example, your method should return the values shown:

**removeAllOccurrences("This is a test", 't')** *returns* **"This is a es"** **removeAllOccurrences("Summer is here!", 'e')** *returns* **"Summr is hr" removeAllOccurrences("---0---", '-')** *returns* **"0"**