

CS101- Algorithms and Programming I

Lab 03

Lab Objectives: while loops, Character class, Strings.

For all labs in CS 101, your solutions must conform to the CS101 style guidelines (rules!).

IMPORTANT: this lab is to practice while loops, you should only use while loops in your solution.

1. Complete the following:

- a. Before writing the program below, you should write the detailed pseudocode steps to the algorithm according to the problem description and sample runs below. Make note of any assumptions you make. You must upload a pdf file containing the algorithm in addition to your java files. The algorithm may be handwritten, etc. but it should not be Java code. The algorithm **must** be uploaded before the lab session for full points.
- b. Write a Java program, Lab03_Q1 in your Lab03 folder. Your program will be able to encode and decode a word entered by the user.

How to encode a word:

- The word being encoded must have at least 2 characters.
- Insert n **random** digits in **random** places into the word, where n represents the length of the word being encoded.
- Split the encoded word into two separate strings at a random index.
- Swap the first part of the string with the second part of the string with a space between.

Your program should display a menu allowing the user to encode and decode messages. You cannot decode a message unless it has first been encoded. You may assume the words being encoded have only letters (no punctuation or other symbols).

You should validate the data input by the user (word length, valid menu options).

Sample Run:

```
1) Encode Message
2) Decode Message
3) Quit
Enter choice: 2
No message to decode....

1) Encode Message
2) Decode Message
3) Quit
Enter choice: 1

Enter word to encode: a
Invalid length word - try again

Enter word to encode: b
Invalid length word - try again

Enter word to encode: xx
Encoded message: x 0x1
```

1) Encode Message
2) Decode Message
3) Quit
Enter choice: 2
The decoded message is: xx

1) Encode Message
2) Decode Message
3) Quit
Enter choice: 1
Enter word to encode: hello
Encoded message: 60 7h86e151

1) Encode Message
2) Decode Message
3) Quit
Enter choice: 2
The decoded message is: hello

1) Encode Message
2) Decode Message
3) Quit
Enter choice: 5
Invalid choice - try again....

1) Encode Message
2) Decode Message
3) Quit
Enter choice: 3
Thank you, goodbye!