**Assignment 1: Java programming with collections**

**0.0**

**Description**

In this assignment, you are to work with the Java collection framework to solve the classical problems of coming up with mnemonic words for telephone numbers.

The dialpad is assumed to be:

|  |  |  |
| --- | --- | --- |
| 1 | 2 ABC | 3 DEF |
| 4 GHI | 5 JKL | 6 MNO |
| 7 PQRS | 8 TUV | 9 WXYZ |
|  | 0 |  |

**1.0**

(1) From word to phone number

In this section, you are to implement, in Java, the functionality of mapping a given **7** letter word to a list of phone numbers that correspond to the given word according to the dialpad.

**Your implementation is case insensitive.**

Implement the following Java class:

(1.a) csci2020u.a1.Word2PhoneMapper

which must satisfy the following interfaces:

package csci2020u.a1;

import java.util.\*;

interface IWord2Phone {

public List<String> map(String word);

}

(1.b) Test your code

Write an executable Java class: csci2020u.a1.Word2Phone which can be used as follows:

$ java csci2020u.a1.Word2Phone oshawac

$ java csci2020u.a1.Word2Phone youknow

(1.c) Submission

You need to submit the following files:

./csci2020u/a1/IWord2Phone.java

./csci2020u/a1/Word2PhoneMapper.java

./csci2020u/a1/Word2Phone.java <= this needs to be executable

**2.0**

(2) From phone number to word

In this part, you are to implement the functionality of mapping a given phone number, find all possible words from a given dictionary of words that coorrespond to the phone number according to the dialpad.

The dictionary is given as a Java class, and you are given the following informaiton about the Java class:

* The class name is csci2020u.a1.helper.Dictionary
* It satisfies the interface Iterable<String>.

Here is the class file and the list of strings it contains:

* [Dictionary.class](http://leda.science.uoit.ca/teaching/sysdev/assignments/a1/csci2020u/a1/helper/Dictionary.class)
* [Dictionary.java](http://leda.science.uoit.ca/teaching/sysdev/assignments/a1/csci2020u/a1/helper/Dictionary.java)
* [Dictionary.txt](http://leda.science.uoit.ca/teaching/sysdev/assignments/a1/csci2020u/a1/helper/Dictionary.txt)

(2.a) csci2020u.a1.Phone2Word

Design an \_executable Java class that makes use of Dictionary class to map a given phone number to all possible words in the dictionary.

The class should be used as:

$ java csci2020u.a1.Phone2Word 7218668

(2.b) Submission

You are to submit the following files:

./csci2020u/a1/Phone2Word.java <== this is executable

**3.0**

**Submission**

Your submission should have the following files:

.

└── csci2020u

└── a1

├── helper

│   └── Dictionary.class

├── IWord2Phone.java

├── Phone2Word.java

├── Word2Phone.java

└── Word2PhoneMapper.java

**4.0**