Assignment 9

Due time: 05/01/2022, 11:59pm

Total credits: 100, 3 questions

Submission guide:

1. Create a folder and name it with the format FirstName_LastName_Aassigment9 for example Chunyu_Yuan_Assignment9

3. compress your file to .zip format and submit it to the blackboard,

4. if you have any question, please send email to cyuan1@gradcenter.cuny.edu

1 Continue designing based on the Assignment 8 (50)

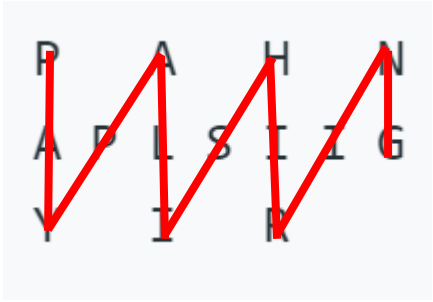
In the assignment 8, we use arithmeticexception to haddle different exceptions. Now you need to design your own customized exception to replace the arithmeticexception for the setElement, getElement and removeElment in your assignment 8 program.

Please also include your TestClass in your submitted folder

2. Algorithm question 1 (25)

The string `"PAYPALISHIRING"` is written in a zigzag pattern on a given number of rows like this: (you may want to display this pattern in a fixed font for better legibility)

```
P   A   H   N
A P L S I I G
Y   I   R
```



And then read line by line: `"PAHNAPLSIIGYIR"`

Write the code that will take a string and make this conversion given a number of rows:

```
string convert(string s, int numRows);
```

Example 1:

```
Input: s = "PAYPALISHIRING", numRows = 3

Output: "PAHNAPLSIIGYIR"
```

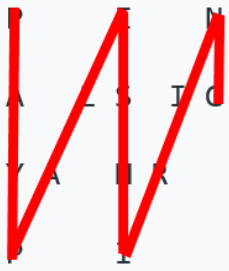
Example 2:

```
Input: s = "PAYPALISHIRING", numRows = 4

Output: "PINALSIGYAHRPI"

Explanation:

P     I    N
A   L S  I G
Y A   H R
P     I
```



Example 3:

```
Input: s = "A", numRows = 1

Output: "A"
```

Constraints:

- `1 <= s.length <= 1000`
- `s` consists of English letters (lower-case and upper-case), `','` and `'.'`.
- `1 <= numRows <= 1000`

```
class Solution1 {
   public String convert(String s, int numRows) {
    //your method
   }
}
```

3. Algorithm question 2 (25)

Given a string containing digits from `2-9` inclusive, return all possible letter combinations that the number could represent. Return the answer in **any order**.

A mapping of digit to letters (just like on the telephone buttons) is given below. Note that 1 does not map to any letters.

Example 1:

```
Input: digits = "23"

Output: ["ad","ae","af","bd","be","bf","cd","ce","cf"]
```

Example 2:

```
Input: digits = ""

Output: []
```

Example 3:

```
Input: digits = "2"

Output: ["a","b","c"]
```

Constraints:

- `0 <= digits.length <= 4`
- `digits[i]` is a digit in the range `['2', '9']`

```
class Solution2 {

    public List<String> letterCombinations(String digits) {



    }

}
```