Introduction to Computer Programming
October 2019
Minor Project-1

Problem: Given four ***n-digit*** positive integers, generate an ***n-digit*** **pin**. Then encrypt a message using the generated **pin**.

Description: Given four n-digit integers, ***i^{th}*** digit of **pin** generated by finding minimum of ***i^{th}*** digit of all 4 integers.

For example: Given four 6-digit integers are as follows:

1^{st} number: 556283
2^{nd} number: 698123
3^{rd} number: 757957
4^{th} number: 839685
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pin: 536123

In the second part of problem, you need to encrypt a given message using the above generated **pin**. The message divided into different **blocks of size *n***. In each block the characters (i^{th}) are shifted forward by **pin(i)** positions. Steps for encryption explained with the following example:

Message: **"Very difficult to break"** (Encrypt it by using pin: **536123**)

Step 1: Remove all white space characters and convert into lower-case.

v	e	r	y	d	i	f	f	i	c	u	l	t	t	o	b	r	e	a	k

Step 2: Divide into blocks of size 6.

v	e	r	y	d	i	f	f	i	c	u	l	t	t	o	b	r	e	a	k

Step 3: Set shifting value by repeating pin characters.

5	3	6	1	2	3	5	3	6	1	2	3	5	3	6	1	2	3	5	3

Step 4: Shift each character by pin(i) positions:

A	H	X	Z	F	L	K	I	O	D	W	O	Y	W	U	C	T	H	F	N

So, encrypted message is: **AHXZFLKIODWOYWUCTHFN**

You can observe that each encrypted character E(i) computed as **E(i)=M(i)+pin(i)**, where M(i) is the i^{th} character of original message. Here the operation performed in cyclic manner.

Note:

- Message should contain only alphabets and white spaces.
- Message should be considered in lower-case.
- White spaces should be removed.
- Blocks should be of size ***n***.
- Forward shifting should be cyclic.
- Encrypted message should be considered in upper-case.

Hints:

You can use the following methods from String class.

int length() :

To find length of string.

char charAt(int i) :

To get the character from index i.

String replaceAll(String sub1, String sub2):

To replace all sub-strings sub1 with sub2. This method can be used to remove all white space in the specific string. For example the following code generates the output "verydifficulttobreak".

```
String msg="  very difficult to break  ";
msg=msg.replaceAll(" ","");
System.out.println(msg);
```

String toLowerCase():

To convert all characters to lower-case. For example the following code generates the output "very difficult to break".

```
String msg="Very Difficult To Break";
msg=msg.toLowerCase();
System.out.println(msg);
```

Points Distribution:

[3 Points] Input n, num1, num2, num3, num4, & message.
[5 Points] To generate **pin.**
[7 Points] To encrypt the message.

(Moreover you need to create a java file with name ***EncryptByPin.java*** *and a word file* ***Output.txt*** and submit both in a folder named with your registration number.)

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