# 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*<sup>th</sup> digit of **pin** generated by finding minimum of *i*<sup>th</sup> digit of all 4 integers.

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

 1st number:
 556283

 2nd number:
 698123

 3rd number:
 757957

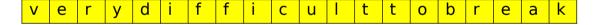
 4th number:
 839685

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.



Step 2: Divide into blocks of size 6.



Step 3: Set shifting value by repeating pin characters.



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



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<sup>th</sup> 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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