CSC 15 project #3

Due date: Friday November 25th by midnight

What to turn in: turn in a soft copy using the following table. Turn in a print out of your code on the due date in class. Your soft copy and hard copy code must match.

Lecture time	Lab Instructor	How to turn in	Subject of the email
T/Th 12:00	**Professor Jackson** **Professor Faroughi**	**Upload to SacCt** **Email to :** codyjackson@csus.edu	Your name CSC 15 project#3, 12:00
T/TH 4:30	**Professor Faroughi**	**Email to:** csc15grader@gmail. com	Your name, CSC 15 Project#3, 4:30
Friday	**Professor Faroughi**	**Email to:** **CSC15.Projects@gmail.com**	Your name CSC 15, project#3, Friday

You must include @author and your name at the top of your program as a comment, otherwise your program will not be graded.

Example:

```
//@author Prof. Faroughi

public class ZipCode {
```

You will be graded based on: correct logic, correct output, comments, indentation, variable naming, and data validation.

Problem:

For faster sorting of letters, the United States Postal Service encourages companies that send large volumes of mail to use a bar code denoting the zip code.

The encoding scheme for a five-digit ZIP code is shown in the table below. The five encoded digits are followed by a check digit, which is computed as follows: Add up all the digits, and choose the check digit to make the sum a multiple of 10. For example, the sum of the digits of the ZIP code 95014 is 19, so the check digit is 1 to make it equal to 20. If the zip code is 95630 than the sum of the digits are 9 +5 + 6 + 3 + 0 = 23 then the check digit is 7 to make the sum equal to 30.

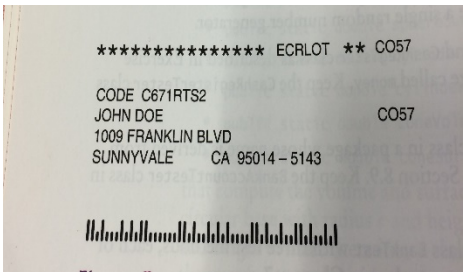
Encoding the zip code: Each digit in the zip code including the check digit, is encoded according to the following table

	7	**4**	**2**	**1**	**0**
1	0	0	0	1	1
2	0	0	1	0	1
3	0	0	1	1	0
4	0	1	0	0	1
5	0	1	0	1	0
6	0	1	1	0	0
7	1	0	0	0	1
8	1	0	0	1	0
9	1	0	1	0	0
0	1	1	0	0	0

Example: if the zip code is 95630 and the check digit is 7 then the encoded zip code will be:
956307 is encoded to:

Encoded: 10100010100110000110110001000 1
Bar Chart: |:|:::|:|::||::::||:||:::|:::|

Here is a real example of a bar code:



Decoding the bar code back to the original zip code: we need to replace each '|' with a 1 and each ':' with a zero. The following barcode:

Bar code: |:|:::||:::::||:|::|:||:::|::|

Decoded: 10100011000001101001011000 1001, group the sequence to into 5 digits

Decoded: Group 1: 10100
Group 2: 01100
Group 3: 00011
Group 4: 01001

Group 5: 01100
Check digit: 01001

Each digit of the zip code can be computed using the provided column weights 7, 4, 2, 1, 0, therefore Group 1: 10100 will be converted to: 1 * 7 + 0 * 4 + 1 * 2 + 0 * 1 + 0 * 0 = 9
The rest of the groups can be weighted to a digit the same way and eventually you can produce the original zip code.
To implement this problem we are going to create a class called ZipCode. After the class ZipCode is implemented you need to write a driver class to use the ZipCode class.
The following files has been provided:

1. ZipCode .java
2. ZipCodeDriver.java
3. zipcodes.txt, this file contains the zip codes along with the name of the cities. You are supposed to read each line and convert the zip code to a bar code and then print the result to a file along with the name of the city. As the result of this step bars.txt file should be created.

Zipcodes.txt

```
91340 San Fernando
94115 San Francisco
95111 San Jose
93406 San Luis Obispo
93118 Santa Barbara
95067 Santa Cruz
95409 Santa Rosa
96019 Shasta Lake
93062 Simi Valley
96158 South Lake Tahoe
95267 Stockton
96146 Tahoe City
```

The output file should look like the following:

Bars.txt

```
|:|:::::||::||::|::|||:::::||:  San Fernando
|:|:::|::|:::||:::||:|:|:||:::  San Francisco
|:|:::|:|::::||:::||:::||::||:  San Jose
|:|::::||::|::|||::::||::|::|:  San Luis Obispo
|:|::::||::::||:::|||::|:|::|:  Santa Barbara
|:|:::|:|:||::::||::|:::|::||:  Santa Cruz
```

```
|:|:::|:|::|::|||:::|:|::::||:  Santa Rosa
|:|:::||::||::::::|||:|:::|:|:  Shasta Lake
|:|::::||:||::::||::::|:|||:::  Simi Valley
|:|:::||:::::||:|:|:|::|::::||  South Lake Tahoe
|:|:::|:|:::|:|:||::|:::|:::||  Stockton
|:|:::||:::::||:|::|:|||:::|::|  Tahoe City
```

Your program will read the bars.txt and coverts the barcodes back to a zip code and print the result in the file zips.txt.

zips.txt

```
San Fernando        91340
San Francisco       94115
San Jose            95111
San Luis Obispo     93406
Santa Barbara       93118
Santa Cruz          95067
Santa Rosa          95409
Shasta Lake         96019
Simi Valley         93062
South Lake Tahoe    96158
Stockton            95267
Tahoe City          96146
```

Sample run of the code:

```
This program converts the zip code to a bar code and vis versa.
This program will read the information from a file and outputs
the result to a file.



Enter the file name that you want to store the barcodes
bars.txt
Enter the file name that contains the zip codes:
zippps.txt
Enter the file name that contains the zip codes:
zz.txt
Enter the file name that contains the zip codes:
zipcodes.txt


Now converting the bar codes back to the original zip code
Enter the file name that contains the barcodes:
bb.txt
Enter the file name that contains the barcodes:
```

```
bars.txt
Enter the file name that you want to store the zip codes
zips.txt

Please check the created files for the output
Thanks for using this application.
```