**Lab 10: Debugging**

1. **Postal-code:**

If you have ever received a letter through the US Postal Service (USPS), you likely saw something like this printed along the edge of the envelope:



This set of dashes is actually a system used by the USPS to encode the zip code to which the letter is being set. The system works in the following way:

1. The set of dashes is broken up into groups of 5, excluding the first and last bars



1. Each set of 5 dashes corresponds to a number based on the pattern (see table below)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Digit | Bar 1 | Bar 2 | Bar 3 | Bar 4 | Bar 5 |
| 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 |

1. The last group (farthest right) is used to check to ensure the zip code is decoded properly; the value of the last group should be the difference between the sum of the values in the zip code and the next largest multiple of 10

For example, the code above would be translated into:

* II.I...I.I.II......II.I..I.I.I....II.I..I..II.I..I.I 🡪 95014-5143
* Error check: digits of zip sum to 32, last digit is 8 🡪 40-32 = 8 🡪 error code checks out

**Instructions:**

Download the file Lab8\_Postal\_Code.m from Canopy and debug the program so that it will correctly take a string of I’s (tall bar) and .’s (short bar) and correctly display the postal code. To help, you have been provided with a flowchart describing how the program is supposed to function, and there are **5** errors in the code.

**High Level Flowchart of Lab8\_Postal\_Code.m**

Get barcode from user

Processed all bars?

Error?

Initialize variables

Get next bar

5 bars?

Convert bars to value and add to zip

Compute sum of zip

Display zip code

Display error

No

No

Yes

Yes

Yes

No

Fill in the table below.

|  |  |
| --- | --- |
| **Description of the error you found:** | **How you fixed the error:** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**For next week:**

1. Debugged code
2. Completed table above of errors