### HW 8 – Fall 2014

**Due:** 11:59pm, Monday Nov. 17

**Honor Code:** All submissions should include a comment statement near the top of the program of the form:

```java
/* THIS CODE IS MY OWN WORK, IT WAS WRITTEN WITHOUT CONSULTING
 * A TUTOR OR CODE WRITTEN BY OTHER STUDENTS - YOUR NAME
 */
```

Cases of apparent plagiarism or collusion will be referred to the Honor Council.

**Preparation:** To disallow other students from reading your homework programs, you must save your file(s) in a directory inside your cs170 directory. If you follow the below commands, your work will be protected.

1. Create a directory called hw8 inside your cs170 project directory to save your hw8 files.
   ```bash
   mkdir ~/cs170/hw8
   ```
2. You must use `~/cs170/hw8` directory as your current directory when editing any program files for hw8. Change your current directory to your newly created hw8 directory:
   ```bash
   cd ~/cs170/hw8
   ```
3. You can now run gedit to edit your programs:
   ```bash
   gedit yourProgramName.java &
   ```

The name `yourProgramName` is the name of the Java program (and also the name of the class!).

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1. Write a class called **MyMatrix**, which contains the following methods.

   (1) (40 pts) **public static int[] snake (int[][] mat).**
   
   Given a matrix of n x n elements (n rows, n columns), this method returns all elements of the matrix in “snake” order. For example if `mat` is
   ```java
   1 2 3
   4 5 6
   7 8 9
   ```
   
   This method should return `{1, 2, 3, 6, 5, 4, 7, 8, 9};`

   (2) (40 pts) **public static int[] zigzag(int[][] mat).**
   
   Given a matrix of n x n elements (n rows, n columns), this method returns all elements of the matrix in zigzag order. For example if `mat` is
   ```java
   1 2 3
   4 5 6
   ```
This method should return \{1, 2, 4, 7, 5, 3, 6, 8, 9\};

(3) (20 pts) public static int[] spiral(int[][] mat).
Given a matrix of \(n \times n\) elements (\(n\) rows, \(n\) columns), this method returns all elements of the matrix in spiral order. For example if \(\text{mat}\) is

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

This method should return \{1, 2, 3, 6, 9, 8, 7, 4, 5\}

You can write your own main function in another class to test the above methods. For example,

```java
class Test {
    public static void main(String[] args) {
        // TODO: Write your test code here. You can call your methods using
        // MyMatrix.methodName.
    }
}
```

Your test program must be in the same folder with MyMatrix.java.

**Submission:**
- Submit your work using the following commands. You need to be in your \~cs170/hw8 directory when you issue them.
  - `/home/cs170001/turnin MyMatrix.java hw8`
- Your homework is not turned unless the above commands are successful (you will get a "success" message when turn in was successful).