

Lab Goal : The lab was designed to help you review classes, objects, arrays, and matrices.

Lab Description : Implement a class that will test a square matrix to determine if it is a magic square. A *magic square* is square matrix that contains unique consecutive integers starting at 1 and where every column, every row, and every diagonal add up to the same value, the magic sum.

- The constructor should accept a square matrix and make a copy of that matrix parameter object. Just copying the reference is not sufficient. The constructor should also calculate and store the `rowSum`.
- The `toString` for this class should make a String that contains the matrix, followed by a message stating "MAGIC SQUARE" if it is a magic square or "NOT A MAGIC SQUARE" if it is not a magic square. The format of the returned string must exactly match the sample output below.
- The `isUnique` method is extra credit and should be completed last. It should return `true` only when each number in the matrix is unique and is in the range of 1 to N^2 , where N is the number of rows and the number of columns in the square matrix.
- The method `rowSumsEqual` should return `true` only when all the row sums are equal to `rowSum`.
- The method `columnSumsEqual` should return `true` only when all the column sums are equal to `rowSum`.
- The method `diagonalSumsEqual` should return `true` only when both the diagonal sums are equal to `rowSum`.
- The method `isMagic` should return `true` only when `isUnique`, `rowSumsEqual`, `columnSumsEqual`, and `diagonalSumsEqual` are true.

Sample Output :

```
8 1 6
3 5 7
4 9 2
MAGIC SQUARE
```

```
6 1 8
7 5 3
2 9 4
MAGIC SQUARE
```

```
8 3 1
3 5 7
9 4 2
NOT A MAGIC SQUARE
```

```
7 12 1 14
2 13 8 11
16 3 10 5
9 6 15 4
MAGIC SQUARE
```

```
17 24 1 8 15
23 5 7 14 16
4 6 13 20 22
10 12 19 21 3
11 18 25 2 9
MAGIC SQUARE
```

```
17 24 1 8 5
23 5 7 14 6
4 6 13 20 2
10 12 19 21 3
11 18 25 2 9
NOT A MAGIC SQUARE
```

15	15	15	15
8	1	6	15
3	5	7	15
4	9	2	15

Use the sample data to test your class. Be sure to add a square matrix that does not contain unique numbers and one that does not contain the numbers in the correct range.