```
1   import java.util.*;
2
3   public class MagicSquare
4   {
5     public static void main(String [] args)
6     {
7       boolean run = true;
8       boolean validSize = false;
9       Scanner scan = new Scanner(System.in);
10      do
11      {
12        int size;
13        while(!validSize)
14        {
15          size = getInt(scan, "Enter the size of magic square (positive & odd)", "Not
    an Integer! Try Again!");
16          if (size % 2 == 0)
17          {
18            System.out.println("INPUT ERROR!!! Invalid size.");
19          }
20          else
21          {
22            System.out.println("The magic square with sinze = 3 is:");
23            printMatrix(genMagicSquare(size));
24            System.out.println("The " + size + "x" + size + "magic square adds up to
    " + (size * (size * size + 1) / 2));
25            System.out.println();
26            validSize = true;
27          }
28        };
29        System.out.print("Do you want to continue (Y/N): ");
30        char input = scan.next().toUpperCase().charAt(0);
31        if (input == 'Y')
32         validSize = false;
33        else if (input == 'N')
34          run = false;
35      } while (run);
36    }
37
38    public static int[][] genMagicSquare(int size)
39    {
40      int[][] magicSquare = new int[size][size];
41      int i = 0;
42      int j = size / 2;
43      int prevI = i;
44      int prevJ = j;
45      for (int k = 1; k <= size * size; k++)
46      {
47        if (i < 0)
48          i = size - 1;
49        if (j > size - 1)
50          j = 0;
51        if (magicSquare[i][j] != 0 || (prevI == 0 && prevJ == size - 1))
52        {
53          i = prevI + 1;
54          j = prevJ;
55        }
56        magicSquare[i][j] = k;
57        prevI = i;
58        prevJ = j;
59        i--; j++;
60      }
61
62      return magicSquare;
63    }
64
65    public static void printMatrix(int[][] matrix)
66    {
67      for(int i = 0; i < matrix.length; i++)
68      {
```

```
69        for (int j = 0; j < matrix[i].length; j++)
70        {
71          System.out.printf("%5d", matrix[i][j]);
72        }
73        System.out.println();
74      }
75    }
76
77    public static int getInt(Scanner scan, String promptMsg, String invalidMsg)
78    {
79      System.out.print(promptMsg);
80      while(!scan.hasNextInt())
81      {
82        scan.next();
83        System.out.print(invalidMsg);
84      }
85
86      return scan.nextInt();
87    }
88  }
```