ASSIGNMENT NO:1 **DATE: / /2018**

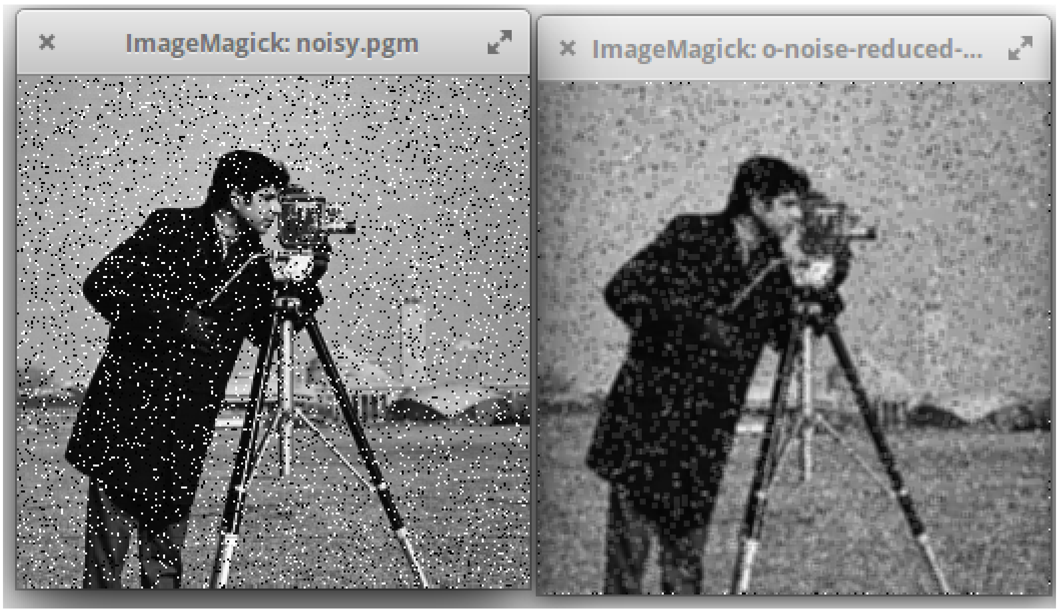
PROGRAM TITLE:Reduce the Noise in an image using Mean Method.

PROGRAM CODE:

```
import java.io.*;
import java.awt.Color;
import java.awt.image.*;
import javax.imageio.*;

class NoiseReduceMean
{
  String meta = "";
  int length, width;
  int image[][];

  public NoiseReduceMean(String imgLoc)//Reading the image
  {
    try
    {
      BufferedReader br = new BufferedReader(new
FileReader(imgLoc));
      meta += br.readLine() + "\n";//First Line is Format
      meta += br.readLine() + "\n";//Comment Line

      String rc = br.readLine();//3rd Line Contains Length and
Breadth
      length = Integer.parseInt(rc.split(" ")[0]);
      System.out.println("Length = " + length);
      width = Integer.parseInt(rc.split(" ")[1]);
      System.out.println("Width = " + width);

      meta += br.readLine() + "\n";//Contains Max Intensity

      image = new int[length][width];

      for (int i = 0; i < length; i++)
        for (int j = 0; j < width; j++)
          image[i][j] = Integer.parseInt(br.readLine());

      br.close();
    }
    catch (Exception e) {
      System.out.println(e);
    }
  }

  public void reduceNoise()
  {
    int newImage[][] = new int[length][width];
    for (int i = 0; i < length; i++)
    {
      for (int j = 0; j < width; j++)
      {
        if (i == 0 || j == 0 || i == length - 1 || j == width - 1)
          newImage[i][j] = image[i][j];
        else
```

```
          newImage[i][j] = getMean(i, j);
        }
      }
      image = newImage;
    }

    public int getMean(int x, int y)
    {
      //Taking 8 Nearest Neighbour Values
      int values[] = { image[x - 1][y + 1], image[x - 1][y], image[x
- 1][y - 1], image[x][y + 1], image[x][y],
          image[x][y - 1], image[x + 1][y - 1], image[x + 1][y],
image[x + 1][y + 1] };
      int sum=0;
      //Sorting to find Median
      for (int i = 0; i < values.length; i++)
      {
        sum+=values[i];
      }
      //Returning Median
      return(sum/values.length);
    }

    public void output()
    {
      try
      {
        PrintWriter printer = new PrintWriter(new
FileWriter("./img/o-noise-reduced-mean.pgm"));
        printer.println(meta.split("\n")[0]);
        printer.println(meta.split("\n")[1]);
        printer.println(length + " " + width);
        printer.println(meta.split("\n")[2]);

        for (int i = 0; i < length; i++)
        {
          for (int j = 0; j < width; j++)
          {
            printer.println(image[i][j]);
          }
        }
        printer.close();
        System.out.println("Image has been written to file");
      }
      catch (Exception e) {
        System.out.println(e);
      }
    }

    public static void main(String args[])
    {
      NoiseReduceMean nr = new NoiseReduceMean("./img/noisy.pgm");
      nr.reduceNoise();
      nr.output();
    }
}
```

OUTPUT:



L: Noisy Image **R:** Image after applying Noise Reduction with Mean