A8: Creating a collage

You can copy one picture to another by copying the color from the pixels in one picture to the pixels in the other picture. To do this you will need to keep track of the row and column information for both the picture you are copying from and the picture you are copying to, as shown in the following `copy` method. The easiest way to do this is to declare and initialize both a `fromRow` and `toRow` in the outer `for` loop and increment them both at the end of the loop. A `for` loop can have more than one variable declaration and initialization and/or modification. Just separate the items with commas. Note that the inner loop has both a `fromCol` and a `toCol` declared, initialized, and incremented.

```
public void copy(Picture fromPic,
                 int startRow, int startCol)
{
  Pixel fromPixel = null;
  Pixel toPixel = null;
  Pixel[][] toPixels = this.getPixels2D();
  Pixel[][] fromPixels = fromPic.getPixels2D();
  for (int fromRow = 0, toRow = startRow;
       fromRow < fromPixels.length &&
       toRow < toPixels.length;
       fromRow++, toRow++)
  {
    for (int fromCol = 0, toCol = startCol;
         fromCol < fromPixels[0].length &&
         toCol < toPixels[0].length;
         fromCol++, toCol++)
    {
      fromPixel = fromPixels[fromRow][fromCol];
      toPixel = toPixels[toRow][toCol];
      toPixel.setColor(fromPixel.getColor());
    }
  }
}
```

You can create a collage by copying several small pictures onto a larger picture. You can do some picture manipulations like zero blue before you copy the picture as well. You can even mirror the result to get a nice artistic effect (Figure 11).

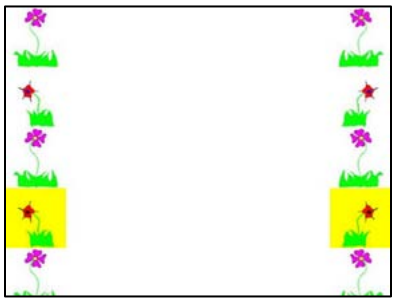

Figure 11: Collage with vertical mirror

The following method shows how to create a simple collage using the `copy` method.

```
public void createCollage()
{
  Picture flower1 = new Picture("flower1.jpg");
  Picture flower2 = new Picture("flower2.jpg");
  this.copy(flower1,0,0);
  this.copy(flower2,100,0);
  this.copy(flower1,200,0);
  Picture flowerNoBlue = new Picture(flower2);
  flowerNoBlue.zeroBlue();
  this.copy(flowerNoBlue,300,0);
  this.copy(flower1,400,0);
  this.copy(flower2,500,0);
  this.mirrorVertical();
  this.write("collage.jpg");
}
```

Notice that the `Picture` method `write` can be used to save a copy of the final collage to your disk as a JPEG picture file. You can also specify the full path name of where to write the picture ("`c:\temp\collage.jpg`"). Be sure to include the extension `(.jpg)` as well so that your computer knows the file type.

You can test this with the `testCollage` method in `PictureTester`.

Exercises

1. Create a second `copy` method that adds parameters to allow you to copy just part of the `fromPic`. You will need to add parameters that specify the start row, end row, start column, and end column to copy from. Write a class (static) test method in `PictureTester` to test this new method and call it in the `main` method.

2. Create a `myCollage` method that has at least three pictures (can be the same picture) copied three times with three different picture manipulations and at least one mirroring. Write a class (static) test method in `PictureTester` to test this new method and call it in the `main` method.