

```
def negative(picture):
    for px in getPixels(picture):
        red=getRed(px)
        green=getGreen(px)
        blue=getBlue(px)
        negColor=makeColor( 255-red, 255-green, 255-blue)
        setColor(px,negColor)

def decreaseRed(picture):
    for p in getPixels(picture):
        value=getRed(p)
        setRed(p,value*0.5)
```

3.5.3 Blending Pictures

When we create collages by copying, any overlap typically means that one picture shows *over* another. The last picture painted on is the one that appears on top of the other. But it doesn't have to be that way. We can *blend* pictures by multiplying their colors and adding them. This gives us the effect of *transparency*.

We know that 100% of something is the whole thing. 50% of one and 50% of another also is a whole. In the recipe below, we blend a picture of the mother and the daughter with an overlap of some 70 (the width of Barbara minus 150) columns of pixels (Figure 3.33).



```
def blendPictures():
    barb = makePicture(getMediaPath("barbara.jpg"))
    katie = makePicture(getMediaPath("Katie-smaller.jpg"))
    canvas = makePicture(getMediaPath("640x480.jpg"))
    #Copy first 150 columns of Barb
    sourceX=1
    for targetX in range(1,150):
        sourceY=1
        for targetY in range(1,getHeight(barb)):
            color = getColor(getPixel(barb,sourceX,sourceY))
            setColor(getPixel(canvas,targetX,targetY),color)
            sourceY = sourceY + 1
            sourceX = sourceX + 1
    #Now, grab the rest of Barb at 50 overlap = getWidth(barb)-150
    sourceX=1
    for targetX in range(150,getWidth(barb)):
        sourceY=1
        for targetY in range(1,getHeight(katie)):
```



FIGURE 3.33: Blending the picture of mom and daughter

```
bpixel = getPixel(barb,sourceX+150,sourceY)
kpixel = getPixel(katie,sourceX,sourceY)
newred= 0.50*getRed(bpixel)+0.50*getRed(kpixel)
newgreen=0.50*getGreen(bpixel)+0.50*getGreen(kpixel)
newblue = 0.50*getBlue(bpixel)+0.50*getBlue(kpixel)
color = makeColor(newred,newgreen,newblue)
setColor(getPixel(canvas,targetX,targetY),color)
sourceY = sourceY + 1
sourceX = sourceX + 1
# Last columns of Katie
sourceX=overlap
for targetX in range(150+overlap,150+getWidth(katie)):
    sourceY=1
    for targetY in range(1,getHeight(katie)):
        color = getColor(getPixel(katie,sourceX,sourceY))
        setColor(getPixel(canvas,targetX,targetY),color)
        sourceY = sourceY + 1
    sourceX = sourceX + 1
show(canvas)
return canvas
```



3.5.4 Rotation

Transformations to the image occur by using the index variables differently or incrementing them differently, but otherwise keeping the same recipe. Let's rotate