def collage():
    picture = makePicture(getMediaPath("starting_picture.jpg"))
    scaledDownPicture = allScale(picture, 0.75)
    canvas = makeEmptyPicture(getWidth(scaledDownPicture) * 2, getHeight(scaledDownPicture) * 2, gray)
    owlsEyes = cropOwlsEyes(scaledDownPicture)
    grayOwlsEyes = grayscale(owlsEyes)
    firstMirrorLU = mirrorPartLeft(scaledDownPicture)
    firstPictureComplete = mirrorPartTop(firstMirrorLU)
    mirroredTemplateRL = duplicatePicture(firstPictureComplete)
    copyOG(firstPictureComplete, canvas, 0, 0)
    removeRedH(scaledDownPicture)
    removeBlueH(scaledDownPicture)
    secondPictureCopy = copyOG(secondPictureComplete, canvas, getWidth(canvas) / 2, 0)
    removeRedV(mirroredTemplateRL)
    thirdPictureComplete = removeGreenV(mirroredTemplateRL)
    copyOG(thirdPictureComplete, canvas, 0, getHeight(canvas) / 2)
    removeRedV(secondPictureComplete)
    fourthPictureComplete = removeGreenV(secondPictureComplete)
def chromakeySignature(signature, target):
    for pixel in getPixels(signature):
        x = getX(pixel)
        y = getY(pixel)
        # targeting exactly where to put the signature took 40+ trys to get right!
        targetPixel = getPixel(target, x + 573, y + 485)
        luminance = getRed(pixel) + getGreen(pixel) + getBlue(pixel)
        if (luminance <= 300):  # call back to luminance from earlier chapters
            signaturePixels = getPixel(signature, x, y)
            # I used orange because I love orange, but it also will show up better in the # collage.
            setColor(targetPixel, orange)
    return(target)

def grayscale(picture):
    for px in getPixels(picture):
        newRed = getRed(px) * 0.299
        newBlue = getBlue(px) * 0.114
        newGreen = getGreen(px) * 0.587
        lum = newRed + newGreen + newBlue
        setColor(px, makeColor(lum, lum, lum))
    return(picture)

def cropOwlsEyes(picture):
    canvas = makeEmptyPicture(230, 90)
    targetX = 0
    for sourceX in range(40, 270):
        targetY = 0
        for sourceY in range(140, 230):
            sourceColor = getColor(getPixel(picture, sourceX, sourceY))
            setColor(getPixel(canvas, targetX, targetY), sourceColor)
            targetY = targetY + 1
        targetX = targetX + 1
    return(canvas)
def mirrorPartLeft(picture):
    mirrorPoint = getWidth(picture)/10
    for x in range(0,mirrorPoint):
        for y in range(0,getHeight(picture)):
            leftQ = getPixel(picture,x,y)
            targetQ = getPixel(picture,mirrorPoint - 1 - x,y)
            setColor(targetQ,getColor(leftQ))
    return(picture)

def mirrorPartTop(picture):
    mirrorPoint = getHeight(picture)/10
    for x in range(0,getWidth(picture)):
        for y in range(0,mirrorPoint):
            topQ = getPixel(picture,x,y)
            targetQ = getPixel(picture,x,mirrorPoint - 1 - y)
            setColor(targetQ,getColor(topQ))
    return(picture)

def removeBlueH(picture):
    for x in range(0,getWidth(picture)/3):
        for y in range(0,getHeight(picture)):
            pixel = getPixel(picture,x,y)
            setBlue(pixel,0)
    return(picture)

def removeGreenH(picture):
    for x in range(getWidth(picture)/3,getWidth(picture)/3+getWidth(picture)/3):
        for y in range(0,getHeight(picture)):
            pixel = getPixel(picture,x,y)
            setGreen(pixel,0)
    return(picture)

def removeRedH(picture):
    for x in range(getWidth(picture)/3+getWidth(picture)/3,getWidth(picture)):
        for y in range(0,getHeight(picture)):
            pixel = getPixel(picture,x,y)
            setRed(pixel,0)
    return(picture)
def removeBlueV(picture):
    for x in range(0, getWidth(picture)):
        for y in range(getHeight(picture)/3 + getHeight(picture)/3, getHeight(picture)):
            pixel = getPixel(picture, x, y)
            setBlue(pixel, 0)
    return(picture)

def removeGreenV(picture):
    for x in range(0, getWidth(picture)):
        for y in range(getHeight(picture)/3, getHeight(picture)/3 + getHeight(picture)/3):
            pixel = getPixel(picture, x, y)
            setGreen(pixel, 0)
    return(picture)

def removeRedV(picture):
    for x in range(0, getWidth(picture)):
        for y in range(0, getHeight(picture)/3):
            pixel = getPixel(picture, x, y)
            setRed(pixel, 0)
    return(picture)

def allScale(picture, uNumber):
    frameForScaling = makeEmptyPicture(int(getWidth(picture)*uNumber), int(getHeight(picture)*uNumber), green)
    sourceX = 0
    for targetX in range(0, int(getWidth(picture) * uNumber)):
        sourceY = 0
        for targetY in range(0, int(getHeight(picture) * uNumber)):
            color = getColor(getPixel(picture, int(sourceX), int(sourceY)))
            setColor(getPixel(frameForScaling, targetX, targetY), color)
            sourceY = sourceY + 1.0/uNumber
            sourceX = sourceX + 1.0/uNumber
    return(frameForScaling)

def copyOG(picture, canvas, startPixelX, startPixelY):
    targetX = startPixelX
    for x in range(0, getWidth(picture)):
        targetY = startPixelY
        for y in range(0, getHeight(picture)):
            pixelsToCopy = getPixel(picture, x, y)
            copyColor = getColor(pixelsToCopy)
            setColor(getPixel(canvas, targetX, targetY), copyColor)
            targetY = targetY + 1
            targetX = targetX + 1
    return(canvas)