def collage():
    picture = makePicture(getMediaPath("beach.jpg"))
    #picture2 = makePicture(getMediaPath("blueMotorcycle.jpg"))
    signing = makePicture(getMediaPath("Esignature.jpg"))
    factor = 0.7
    canvas = makeEmptyPicture(1000,736)
    # addText(canvas, 870, 670, "Eric Segbor")
    picHold = makeEmptyPicture(int(getWidth(signing) * 0.20), int(getHeight(signing)*0.20))
    pictureH = scale2(signing, picHold, 0.20)
    edgedetect(picture)
    negative(picture)
    mirrorVertical(picture)
    mirrorHalf(picture)
    scale(picture, canvas, factor)
    copy(picture, 0, 0, getWidth(picture), getHeight(picture), canvas, 0, 0)
    #copy(picture2, 0, 0, getWidth(picture2), getHeight(picture2), canvas, 100, 0)
    addSignature(canvas, pictureH, 836, 642, black)
    explore(canvas)
    show(canvas)

def addSignature(target, signing, toX, toY, color):
    toYStart = toY
    for x in range(0, getWidth(signing)):
        toY = toYStart
        for y in range(0, getHeight(signing)):
            p = getPixel(signing, x, y)
            if(getRed(p) < 225 and getGreen(p) < 225 and getBlue(p) < 225):
                setColor(getPixel(target, toX, toY), color)
                toY = toY + 1
                toX = toX + 1
    return target

def copy(source, srcX, srcY, srcXb, srcYb, canvas, canXb, canYb):
    targetX = 0
    for x in range (srcX, srcXb):
        targetY = 0
        for y in range (srcY, srcYb):
            px = getPixel(source, x, y)
            targetPx = getPixel(canvas, targetX, targetY)
            setColor(targetPx, getColor(px))
            targetY = targetY + 1
            targetX = targetX + 1
    targetX = 360
    for x in range (srcX, srcXb):
        targetY = 210
        for y in range (srcY, srcYb):
            px = getPixel(source, x, y)
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targetPx = getPixel(canvas, targetX, targetY)
setRed(targetPx, getRed(px))
targetY = targetY + 1
targetX = targetX + 1

targetX = 180
for x in range (srcX, srcXb):
    targetY = 110
    for y in range (srcY, srcYb):
        px = getPixel(source, x, y)
        targetPx = getPixel(canvas, targetX, targetY)
        setGreen(targetPx, getGreen(px))
        targetY = targetY + 1
        targetX = targetX + 1

for x in range (srcX, srcXb):
    targetY = 110
    for y in range (srcY, srcYb):
        px = getPixel(source, x, y)
        targetPx = getPixel(canvas, targetX, targetY)
        setGreen(targetPx, getGreen(px))
        targetY = targetY + 1
        targetX = targetX + 1

for x in range (srcX, srcXb):
    targetY = 210
    for y in range (srcY, srcYb):
        px = getPixel(source, x, y)
        targetPx = getPixel(canvas, targetX, targetY)
        setBlue(targetPx, getBlue(px))
        targetY = targetY + 1
        targetX = targetX + 1

def scale(picture_in, picture_out, factor):
    in_x = 0
    for out_x in range(0, int(getWidth(picture_in) * factor)):
        in_y = 0
        for out_y in range(0, int(getHeight(picture_in) * factor)):
            color = getColor(getPixel(picture_in, int(in_x), int(in_y)))
            setColor(getPixel(picture_out, out_x, out_y), color)
            in_y = in_y + 1.0 / factor
            in_x = in_x + 1.0 / factor

def scale2(picture_in, picture_out, factor):
    in_x = 0
    for out_x in range(0, int(getWidth(picture_in) * factor)):
        in_y = 0
        for out_y in range(0, int(getHeight(picture_in) * factor)):
            color = getColor(getPixel(picture_in, int(in_x), int(in_y)))
            setColor(getPixel(picture_out, out_x, out_y), color)
            in_y = in_y + 1.0 / factor
            in_x = in_x + 1.0 / factor
    return picture_out

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

def mirrorVertical(picture):
mirrorPoint = getWidth(picture)/2
width = getWidth(picture)
for y in range(0,getHeight(picture)):
    for x in range(0,mirrorPoint):
        leftPixel = getPixel(picture,x,y)
        rightPixel = getPixel(picture,width - x -1,y)
        color = getColor(leftPixel)
        setColor(rightPixel,color)

def mirrorHalf(picture):
pixels = getPixels(picture)
target = len(pixels) - 1
for index in range(0,len(pixels)/2):
    pixel1 = pixels[index]
    color1 = getColor(pixel1)
    pixel2 = pixels[target]
    setColor(pixel2,color1)
target = target - 1

def luminance(pixel):
r = getRed(pixel)
g = getGreen(pixel)
b = getBlue(pixel)
return (r+g+b)/3

def edgedetect(picture):
    for px in getPixels(picture):
        x = getX(px)
y = getY(px)
        if y < getHeight(picture)-1 and x < getWidth(picture)-1:
            botrt = getPixel(picture,x+1,y+1)
            thislum = luminance(px)
            brlum = luminance(botrt)
            if abs(brlum-thislum) > 20:
                setColor(px,black)
            if abs(brlum-thislum) <= 20:
                setColor(px,white)