from jes import *

def collage():
    picture = makePicture("colorful.jpg")
    mod1 = makePicture("colorful.jpg")
    mod2 = makePicture("colorful.jpg")
    mod3 = makePicture("colorful.jpg")
    mod4 = makePicture("colorful.jpg")
    mod5 = makePicture("colorful.jpg")
    canvas = makeEmptyPicture(getWidth(picture) * 2, getHeight(picture) * 2)
    sig = makePicture("sig.jpg")
    sig = scaleDown(sig, 15)

    lighten(mod1)
    mirrorHorizontal(mod1)
    reduceGreenNotReusable(mod3)
    reduceRedNotReusable(mod4)
    negative(mod2)
    mirrorBotTop(mod3)
    mirrorHorizontal(mod4)

    copy(mod1, canvas, 0, 0)
    copy(mod2, canvas, getWidth(mod2), 0)
    copy(mod3, canvas, 0, getHeight(mod3))
    copy(mod4, canvas, getWidth(mod4), getHeight(mod4))
    copy(mod5, canvas, getWidth(canvas) / 2 - getWidth(mod5) / 2, getHeight(canvas) / 4)
    chromaSig(sig, canvas, getWidth(canvas) - 105, getHeight(canvas) - 70)
show(canvas)
writePictureTo(canvas, "jasmin_collage.jpg")

def rotateLeft(mod2, canvas):
    targetX = 0
    width = getWidth(mod2)
    for sourceX in range(0, getWidth(mod2)):
        targetY = 0
        for sourceY in range(0, getHeight(mod2)):
            color = getColor(getPixel(mod2, sourceX, sourceY))
            setColor(getPixel(canvas, targetY, width - targetX - 1), color)
            targetY = targetY + 1
        targetX = targetX + 1

def copy(picture, target, targX, targY):
    targetX = targX
    for x in range(0, getWidth(picture)):
        targetY = targY
        for y in range(0, getHeight(picture)):
            px = getPixel(picture, x, y)
            tx = getPixel(target, targetX, targetY)
            setColor(tx, getColor(px))
        targetY = targetY + 1
    targetX = targetX + 1

def reduceGreenNotReusable(picture):
    for px in getPixels(picture):
        value = getGreen(px)
        setGreen(px, value * 0.7)
    repaint(picture)

def reduceRedNotReusable(picture):
    for px in getPixels(picture):
        value = getGreen(px)
        setRed(px, value * 0.7)
    repaint(picture)

def mirrorHorizontal(picture):
    mirrorPoint = getHeight(picture)//2
    height = getHeight(picture)
    for x in range(0, getWidth(picture)):
        for y in range(0, mirrorPoint):
            topPixel = getPixel(picture, x, y)
            bottomPixel = getPixel(picture, x, height - y - 1)
def scale(picture, canvas, factor):
    sourceX = 0
    for targetX in range(0, int(getWidth(picture) * factor)):
        sourceY = 0
        for targetY in range(0, int(getHeight(picture) * factor)):
            color = getColor(getPixel(picture, int(sourceX), int(sourceY)))
            setColor(getPixel(canvas, targetX, targetY), color)
            sourceY = sourceY + 1.0 / factor
            sourceX = sourceX + 1.0 / factor

def scaleDown(picture, factor):
    canvas = makeEmptyPicture(int(getWidth(picture) // factor), int(getHeight(picture) // factor))
    scale(picture, canvas, 1.0/ factor)
    return canvas

def mirrorBotTop(picture):
    mirrorPoint = getHeight(picture)//2
    height = getHeight(picture)
    for x in range(0, getWidth(picture)):
        for y in range(0, mirrorPoint):
            topPixel = getPixel(picture, x, y)
            bottomPixel = getPixel(picture, x, height - y - 1)
            color = getColor(bottomPixel)
            setColor(topPixel, color)

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 lighten(picture):
    for px in getPixels(picture):
        color = getColor(px)
        color = makeLighter(color)
setColor(px, color)

def chromaSig(picture, target, targetX, targetY):
    for x in range(0, getWidth(picture)):
        for y in range(0, getHeight(picture)):
            px = getPixel(picture, x, y)
            color = getColor(px)
            targ = getPixel(target, x + targetX, y + targetY)
            if distance(black, color) < 200:
                setColor(targ, red)

collage()