from jes import *

def collage():
    picture = scaleDown(makePicture("smokies.jpg"),2)
    pic = scaleDown(makePicture("smokies.jpg"),2)
    target = scaleDown(makePicture("fireout.jpg"),2)
targot = scaleDown(makePicture("fireout.jpg"),2)
targ = scaleDown(makePicture("fireout.jpg"),2)
picWidth = getWidth(picture)
picHeight = getHeight(picture)
    canvas = makeEmptyPicture(picWidth * 3, picHeight * 3)
sig = makePicture("sig.jpg")
small_sig = scaleDown(sig,4)
copy(picture, canvas, picWidth * 2, 0)
blendedOne = blended(picture, target)
chromaSig(small_sig, picture, 400, 350)
copy(targ, canvas, 0, 0)
copyHalf(targ, canvas, getWidth(canvas) / 3, getHeight(canvas)/3, 0, int(getWidth(target) /2))
copyHalf(picture, canvas, getWidth(canvas)/2, getHeight(canvas)/3, int(picWidth /2), int(picWidth))
mirrorSmokies(pic)
copy(pic, canvas, 0, picHeight)
negative(targot)
copy(targot, canvas, picWidth * 2, picHeight)
grayScale(targ)
mirrorHorizontal(targ)
copy(targ, canvas, 0, picHeight * 2)
mirrorHorizontal(pic)
copy(pic, canvas, picWidth * 2, picHeight * 2)
copy(blendedOne, canvas, picWidth, 0)
blendT = blendThat(pic, targ)
copy(blendT, canvas, picWidth, picHeight * 2)
small_canvas = scaleDown(canvas, 2.8)
show(small_canvas)
writePictureTo(small_canvas,"austin_collage.jpg")

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

def copyHalf(picture, target, targX, targY, startX, stopX):
    targetX = targX
    for pictureX in range(startX, stopX):
        targetY = targY
        for pictureY in range(0, getHeight(picture)):
            px = getPixel(picture,pictureX,pictureY)
            tx = getPixel(target,targetX,targetY)
            setColor(tx,getColor(px))
            targetY=targetY + 1
            targetX=targetX + 1

def mirrorSmokies(pic):
    mirrorPoint = getWidth(pic) //2
    width = getWidth(pic)
    for y in range(0, getHeight(pic)):
        for x in range(0, mirrorPoint):
            leftPixel = getPixel(pic, x, y)
            rightPixel = getPixel(pic, width - x - 1, y)
            color = getColor(leftPixel)
            setColor(rightPixel,color)
def negative(target):
    for u in getPixels(target):
        red = getRed(u)
        green = getGreen(u)
        blue = getBlue(u)
        negColor = makeColor(255-red, 255-green, 255-blue)
        setColor(u, negColor)

def grayScale(target):
    for e in getPixels(target):
        intensity = (getRed(e) + getGreen(e) + getBlue(e))/3
        setColor(e, makeColor(intensity, intensity, intensity))

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

def mirrorHorizontal(pic):
    mirrorPoint = getHeight(pic) //2
    height = getHeight(pic)
    for x in range(0, getWidth(pic)):
        for y in range(0, mirrorPoint):
            topPixel = getPixel(pic, x, y)
            bottomPixel = getPixel(pic, x, height - y - 1)
            color = getColor(topPixel)
            setColor(bottomPixel, 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)
def scaleDown(picture, factor):
    canvas = makeEmptyPicture(int(getWidth(picture) / factor), int(getHeight(picture) / factor))
    scale(picture, canvas, 1.0 / factor)
    return canvas

def scale(picture, canvas, factor):
    pictureX = 0
    for targetX in range(0, int(getWidth(picture) * factor)):
        pictureY = 0
        for targetY in range(0, int(getHeight(picture) * factor)):
            color = getColor(getPixel(picture, int(pictureX), int(pictureY)))
            setColor(getPixel(canvas, targetX, targetY), color)
            pictureY = pictureY + 1.0 / factor
        pictureX = pictureX + 1.0 / factor

def blended(picture, target):
    for start in range(2):
        for x in range(start, getWidth(picture), 2):
            for y in range(start, getHeight(picture), 2):
                picturePx = getPixel(picture, x, y)
                targetPx = getPixel(target, x, y)
                setColor(targetPx, getColor(picturePx))
    return target

def blendThat(pic, targ):
    for start in range(2):
        for x in range(start, getWidth(pic), 2):
            for y in range(start, getHeight(pic), 2):
                picPx = getPixel(pic, x, y)
                targPx = getPixel(targ, x, y)
                setColor(targPx, getColor(picPx))
    return targ

collage()