#Bethany Eyrick March 6, 2020

def makeSunset(picture):
    for p in getPixels(picture):
        value = getBlue(p)
        setBlue(p, value * 0.6)
        value = getGreen(p)
        setGreen(p, value * 0.6)

def scaleDown(picture_in, picture_out, scale):
    sourceX = 0
    for targetX in range(0, getWidth(picture_in) / scale):
        sourceY = 0
        for targetY in range(0, getHeight(picture_in) / scale):
            color = getColor(getPixel(picture_in, sourceX, sourceY))
            setColor(getPixel(picture_out, targetX, targetY), color)
            sourceY = sourceY + scale
        sourceX = sourceX + scale

def mirrory(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(topPixel)
            setColor(bottomPixel, color)

def darken(picture, starty, endy):
    for x in range(0, getWidth(picture)):
        for y in range(starty, endy):
            px = getPixel(picture, x, y)
            color = getColor(px)
            color = makeDarker(color)
            color = makeDarker(color)
            setColor(px, color)
def increaseBlue(picture):
    for p in getPixels(picture):
        value = getBlue(p)
        setBlue(p, value * 1.5)

def copy(picture_in, picture_out, tx, ty):
    targetX = tx
    for sourceX in range(0, getWidth(picture_in)):
        targetY = ty
        for sourceY in range(0, getHeight(picture_in)):
            color = getColor(getPixel(picture_in, sourceX, sourceY))
            setColor(getPixel(picture_out, targetX, targetY), color)
            targetY = targetY + 1
            targetX = targetX + 1

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

def grayPosterize(pic):
    for p in getPixels(pic):
        r = getRed(p)
        g = getGreen(p)
        b = getBlue(p)
        luminance = (r + g + b) / 3
        if luminance < 100:
            setColor(p, black)
        if luminance >= 100:
            setColor(p, white)

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 collage():
    picture = makePicture(getMediaPath("ocean.jpg"))
    canvas = makeEmptyPicture(1000, 660, black)
    smPic = makeEmptyPicture(getWidth(picture) / 9, getHeight(picture) / 9)
    # create negative and copy to outermost sides
    scaleDown(picture, smPic, 9)
    negative(smPic)
    copy(smPic, canvas, 0, 0)
    copy(smPic, canvas, 560, 0)
    # gray posterize and copy to each side
    scaleDown(picture, smPic, 9)
    grayPosterize(smPic)
    copy(smPic, canvas, 56, 0)
    copy(smPic, canvas, 504, 0)
# increase blue value in picture and copy to each side
scaleDown(picture, smPic, 9)
increaseBlue(smPic)
copy(smPic, canvas, 112, 0)
copy(smPic, canvas, 448, 0)

# grayscale, darken, and copy to each side
scaleDown(picture, smPic, 9)
grayScale(smPic)
darken(smPic, 0, getHeight(smPic))
copy(smPic, canvas, 168, 0)
copy(smPic, canvas, 392, 0)

# sunset and copy to each side of original
scaleDown(picture, smPic, 9)
makeSunset(smPic)
copy(smPic, canvas, 224, 0)
copy(smPic, canvas, 336, 0)

# original picture with mirrored top half to bottom
scaleDown(picture, smPic, 9)
mirrorY(smPic)

# darken the mirrored half of the picture
darken(smPic, getHeight(smPic)/2, getHeight(smPic))
copy(smPic, canvas, 280, 0)
explore(canvas)