# Alexandra Harris

Completed

Original

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from mediaComp import *

def posterize2color(picture):
    for pixel in getPixels(picture):
        red_value = getRed(pixel)
        green_value = getGreen(pixel)
        blue_value = getBlue(pixel)
        luminance = (red_value + green_value + blue_value) // 3
        if luminance < 100:
            setColor(pixel, makeColor(64, 64, 64))
        else:
            setColor(pixel, makeColor(255, 255, 255))

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

def purpleTint(picture):
    for pixel in getPixels(picture):
        red_value = getRed(pixel)
        blue_value = getBlue(pixel)
        green_value = getGreen(pixel)
        if red_value < 63:
            red_value = red_value * 1.05
            blue_value = blue_value * 1.25
            green_value = green_value * 0.7
        elif red_value < 192:
            red_value = red_value * 1.1
            blue_value = blue_value * 1.35
            green_value = green_value * 0.65
        else:
            red_value = red_value * 1.05
            blue_value = blue_value * 1.4
            green_value = green_value * 0.6
        setRed(pixel, red_value)
        setBlue(pixel, blue_value)
        setGreen(pixel, green_value)

def greenTint(picture):
    for pixel in getPixels(picture):
        red_value = getRed(pixel)
        blue_value = getBlue(pixel)
        green_value = getGreen(pixel)
        if red_value < 63:
            red_value = red_value * 0.7
            blue_value = blue_value * 0.7
            green_value = green_value * 1.3
        elif red_value < 192:
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            red_value = red_value * 0.6
            blue_value = blue_value * 0.6
            green_value = green_value * 1.4
        else:
            red_value = red_value * 0.65
            blue_value = blue_value * 0.65
            green_value = green_value * 1.25
        setRed(pixel, red_value)
        setBlue(pixel, blue_value)
        setGreen(pixel, green_value)

def blur(picture):
    blur_picture = duplicatePicture(picture)
    for x in range(1, getWidth(picture) - 1):
        for y in range(1, getHeight(picture) - 1):
            center = getPixelAt(blur_picture, x, y)
            p1 = getPixelAt(picture, x-1, y-1)
            p2 = getPixelAt(picture, x, y-1)
            p3 = getPixelAt(picture, x+1, y-1)
            p4 = getPixelAt(picture, x-1, y)
            p5 = getPixelAt(picture, x, y)
            p6 = getPixelAt(picture, x+1, y)
            p7 = getPixelAt(picture, x-1, y+1)
            p8 = getPixelAt(picture, x, y+1)
            p9 = getPixelAt(picture, x+1, y+1)
            new_red = (getRed(p1)+getRed(p2)+getRed(p3)+
                       getRed(p4)+getRed(p5)+getRed(p6)+
                       getRed(p7)+getRed(p8)+getRed(p9)) // 9
            new_green = (getGreen(p1)+getGreen(p2)+getGreen(p3)+
                         getGreen(p4)+getGreen(p5)+getGreen(p6)+
                         getGreen(p7)+getGreen(p8)+getGreen(p9)) // 9
            new_blue = (getBlue(p1)+getBlue(p2)+getBlue(p3)+
                        getBlue(p4)+getBlue(p5)+getBlue(p6)+
                        getBlue(p7)+getBlue(p8)+getBlue(p9)) // 9
            setColor(center, makeColor(new_red, new_green, new_blue))

def blurCopy(picture):
    blur_picture = duplicatePicture(picture)
    for x in range(1, getWidth(picture) - 1):
        for y in range(1, getHeight(picture) - 1):
            center = getPixelAt(blur_picture, x, y)
            p1 = getPixelAt(picture, x-1, y-1)
            p2 = getPixelAt(picture, x, y-1)
            p3 = getPixelAt(picture, x+1, y-1)
            p4 = getPixelAt(picture, x-1, y)
            p5 = getPixelAt(picture, x, y)
            p6 = getPixelAt(picture, x+1, y)
            p7 = getPixelAt(picture, x-1, y+1)
            p8 = getPixelAt(picture, x, y+1)
            p9 = getPixelAt(picture, x+1, y+1)
            r = (getRed(p1)+getRed(p2)+getRed(p3)+
                 getRed(p4)+getRed(p5)+getRed(p6)+
                 getRed(p7)+getRed(p8)+getRed(p9)) // 9
            g = (getGreen(p1)+getGreen(p2)+getGreen(p3)+
                 getGreen(p4)+getGreen(p5)+getGreen(p6)+
                 getGreen(p7)+getGreen(p8)+getGreen(p9)) // 9
            b = (getBlue(p1)+getBlue(p2)+getBlue(p3)+
                 getBlue(p4)+getBlue(p5)+getBlue(p6)+
                 getBlue(p7)+getBlue(p8)+getBlue(p9)) // 9
            setColor(center, makeColor(r, g, b))
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    return blur_picture

def copyPicture(source, target, startX, startY):
    width = getWidth(source)
    height = getHeight(source)
    for x in range(width):
        for y in range(height):
            sourcePixel = getPixelAt(source, x, y)
            targetPixel = getPixelAt(target, x + startX, y + startY)
            setColor(targetPixel, getColor(sourcePixel))

def collage():
    original = makePicture(getMediaFolder("billypic.jpg"))
    max_width = 1000
    max_height = 736
    original_width = getWidth(original)
    original_height = getHeight(original)
    scale_factor = min(max_width/(original_width*3),max_height/(original_height*2),1)
    if scale_factor < 1:
        new_width = int(original_width * scale_factor)
        new_height = int(original_height * scale_factor)
        resized = makeEmptyPicture(new_width, new_height)
        for x in range(new_width):
            for y in range(new_height):
                original_x = int(x / scale_factor)
                original_y = int(y / scale_factor)
                color = getColor(getPixelAt(original, original_x, original_y))
                setColor(getPixelAt(resized, x, y), color)
        original = resized
    width = getWidth(original)
    height = getHeight(original)
    collage_pic = makeEmptyPicture(width * 3, height * 2)
    # create copies
    purple = duplicatePicture(original)
    gray = duplicatePicture(original)
    green = duplicatePicture(original)
    poster = duplicatePicture(original)
    blur_pic = duplicatePicture(original)
    # purple tint
    for pixel in getPixels(purple):
        r = getRed(pixel)
        b = getBlue(pixel)
        g = getGreen(pixel)
        setRed(pixel, r * 1.05)
        setBlue(pixel, b * 1.35)
        setGreen(pixel, g * 0.65)
    #grayscale
    for pixel in getPixels(gray):
        intensity = (getRed(pixel) + getGreen(pixel) + getBlue(pixel)) / 3
        setColor(pixel, makeColor(intensity, intensity, intensity))
    #green tint
    for pixel in getPixels(green):
        r = getRed(pixel)
        b = getBlue(pixel)
        g = getGreen(pixel)
        setRed(pixel, r * 0.6)
        setBlue(pixel, b * 0.6)
        setGreen(pixel, g * 1.4)
    #posterize
    for pixel in getPixels(poster):
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    lum = (getRed(pixel) + getGreen(pixel) + getBlue(pixel)) // 3
    if lum < 100:
        setColor(pixel, makeColor(64, 64, 64))
    else:
        setColor(pixel, makeColor(255, 255, 255))
#blur
blur_pic = blurCopy(original)
#image placement
copyPicture(original, collage_pic, 0, 0)
copyPicture(purple, collage_pic, width, 0)
copyPicture(gray, collage_pic, width * 2, 0)
copyPicture(green, collage_pic, 0, height)
copyPicture(poster, collage_pic, width, height)
copyPicture(blur_pic, collage_pic, width * 2, height)
pictureTool(collage_pic)
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