Ryland Hendey

Completed

Original

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import os
from mediaComp import *

def copyTo(source, target, targetX, targetY):
    for x in range(getWidth(source)):
        for y in range(getHeight(source)):
            if 0 <= targetX + x < getWidth(target) and 0 <= targetY + y < getHeight(target):
                color = getColor(getPixelAt(source, x, y))
                setColor(getPixelAt(target, targetX + x, targetY + y), color)

def scaleHalf(picture):
    width = getWidth(picture)
    height = getHeight(picture)
    newPic = makeEmptyPicture(width // 2, height // 2)

    for x in range(0, width, 2):
        for y in range(0, height, 2):
            if x + 1 < width and y + 1 < height:
                px1 = getPixelAt(picture, x, y)
                px2 = getPixelAt(picture, x+1, y)
                px3 = getPixelAt(picture, x, y+1)
                px4 = getPixelAt(picture, x+1, y+1)

                r = (getRed(px1) + getRed(px2) + getRed(px3) + getRed(px4)) // 4
                g = (getGreen(px1) + getGreen(px2) + getGreen(px3) + getGreen(px4)) // 4
                b = (getBlue(px1) + getBlue(px2) + getBlue(px3) + getBlue(px4)) // 4

                setColor(getPixelAt(newPic, x//2, y//2), makeColor(r, g, b))

    return newPic

def makeGrayscale(picture):
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    for x in range(getWidth(picture)):
        for y in range(getHeight(picture)):
            p = getPixelAt(picture, x, y)
            avg = (getRed(p) + getGreen(p) + getBlue(p)) // 3
            setColor(p, makeColor(avg, avg, avg))
    return picture

def lighten(picture, amount):
    for x in range(getWidth(picture)):
        for y in range(getHeight(picture)):
            p = getPixelAt(picture, x, y)
            r = min(getRed(p) + amount, 255)
            g = min(getGreen(p) + amount, 255)
            b = min(getBlue(p) + amount, 255)
            setColor(p, makeColor(r, g, b))
    return picture

def negative(picture):
    for x in range(getWidth(picture)):
        for y in range(getHeight(picture)):
            p = getPixelAt(picture, x, y)
            r = 255 - getRed(p)
            g = 255 - getGreen(p)
            b = 255 - getBlue(p)
            setColor(p, makeColor(r, g, b))
    return picture

def copyPicture(picture):
    newPic = makeEmptyPicture(getWidth(picture), getHeight(picture))
    for x in range(getWidth(picture)):
        for y in range(getHeight(picture)):
            color = getColor(getPixelAt(picture, x, y))
            setColor(getPixelAt(newPic, x, y), color)
    return newPic

def whiteSilhouette(picture):
    width = getWidth(picture)
    height = getHeight(picture)
    newPic = makeEmptyPicture(width, height)
    for x in range(width):
        for y in range(height):
            p = getPixelAt(picture, x, y)
            brightness = (getRed(p) + getGreen(p) + getBlue(p)) // 3
            # invert brightness so white is brightest and black is darkest but shifted lighter
            whiteShade = 255 - brightness // 2
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            setColor(getPixelAt(newPic, x, y), makeColor(whiteShade, whiteShade, whiteShade))
    return newPic

def addSignature(collagePic, signaturePic, posX, posY):
    sigWidth = getWidth(signaturePic)
    sigHeight = getHeight(signaturePic)

    for x in range(sigWidth):
        for y in range(sigHeight):
            sigPixel = getPixelAt(signaturePic, x, y)
            r = getRed(sigPixel)
            g = getGreen(sigPixel)
            b = getBlue(sigPixel)

            if not (r > 240 and g > 240 and b > 240):
                targetX = posX + x
                targetY = posY + y

                if 0 <= targetX < getWidth(collagePic) and 0 <= targetY < getHeight(collagePic):
                    setColor(getPixelAt(collagePic, targetX, targetY), makeColor(0, 0, 0))


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# Main Collage Function
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def collage():
    original = makePicture(os.path.join(getMediaFolder(), "turtle-dragon.jpg"))


    # Make versions
    half = scaleHalf(original)
    gray = scaleHalf(makeGrayscale(copyPicture(original)))
    light = scaleHalf(lighten(copyPicture(original), 50))
    neg = scaleHalf(negative(copyPicture(original)))
    silhouette = scaleHalf(whiteSilhouette(copyPicture(original)))

    width = getWidth(half)
    height = getHeight(half)

    # Canvas width is 3 * width but now images touch each other like an H:
    # left two images (width), silhouette (width), right two images (width)
    canvas_width = width * 3
    canvas_height = height * 2
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canvas = makeEmptyPicture(canvas_width, canvas_height)

# Fill canvas with black background
for x in range(canvas_width):
    for y in range(canvas_height):
        setColor(getPixelAt(canvas, x, y), makeColor(0, 0, 0))

# Place left two images (top-left and bottom-left) at x=0
copyTo(half, canvas, 0, 0)             # top-left (far left)
copyTo(light, canvas, 0, height)       # bottom-left (far left)

# Place middle silhouette image at x=width, centered vertically
centerY = (canvas_height // 2) - (height // 2)

# Fill purple above silhouette
purpleColor = makeColor(128, 0, 128)  # Medium purple
for x in range(width, width * 2):
    for y in range(0, centerY):
        setColor(getPixelAt(canvas, x, y), purpleColor)

# Fill purple below silhouette
for x in range(width, width * 2):
    for y in range(centerY + height, canvas_height):
        setColor(getPixelAt(canvas, x, y), purpleColor)

# Place the silhouette itself
copyTo(silhouette, canvas, width, centerY)

# Place right two images (top-right and bottom-right) at x=width*2
copyTo(gray, canvas, width * 2, 0)     # top-right (far right)
copyTo(neg, canvas, width * 2, height) # bottom-right (far right)

# Add signature
signature = makePicture(os.path.join(getMediaFolder(), "signature.png"))
sigX = getWidth(canvas) - getWidth(signature) - 10
sigY = getHeight(canvas) - getHeight(signature) - 10
addSignature(canvas, signature, sigX, sigY)

show(canvas)
return canvas
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