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#the collage is made by changing the source picture 5 different times, and copying a segment of that changed picture onto the canvas

def collage():
    canvas = makeEmptyPicture(1000,736,white)

    #this ghost image was taken by me, so I own this image
    ghost = makePicture(getMediaPath("ghost.jpg"))

    #this creates the first slice (blurred) and copies it onto canvas
    blurred = blur()
    copyToCanvas(blurred,canvas,0,200)

    #this creates the second slice (posterize) and copies it onto canvas
    posterized = posterize()
    copyToCanvas(posterized,canvas,200,400)

    #this creates the third slice (my own pattern) and copies it onto canvas
    weirdPatterned = weirdPattern()
    copyToCanvas(weirdPatterned,canvas,400,600)

    #this creates the fourth slice (grayscale) and copies it onto canvas
    grayscaled = grayscale()
    copyToCanvas(grayscaled,canvas,600,800)

    #this creates the fifth slice (edge detect) and copies it onto canvas
    edgeDetected = edgeDetect()
    copyToCanvas(edgeDetected,canvas,800,1000)
def signature(target):
    signature = makePicture(getMediaPath("sig.jpg"))
    canvasBefore = duplicatePicture(target)
    # this code copies the signature to canvas
    targetX = 0
    for sourceX in range(0, getWidth(signature)):
        targetY = 0
        for sourceY in range(0, getHeight(signature)):
            setColor(getPixel(target, targetX, targetY), getColor(getPixel(signature, sourceX, sourceY)))
            targetY = targetY + 1
        targetX = targetX + 1
    # this code chromakeys the white out and replaces the black writing with red
    for x in range(0, 209):
        for y in range(0, 31):
            if distance(getColor(getPixel(target, x, y)), makeColor(255, 255, 255)) < 100:
                setColor(getPixel(target, x, y), getColor(getPixel(canvasBefore, x, y)))
            if distance(getColor(getPixel(target, x, y)), makeColor(0, 0, 0)) < 100:
                setColor(getPixel(target, x, y), black)
    return (target)

# this function is used several times in the main function to copy a segment and paste it onto canvas
def copyToCanvas(source, target, startX, endX):
    targetX = startX
    for sourceX in range(startX, endX):
        targetY = 0
        for sourceY in range(0, getHeight(source)):
            setColor(getPixel(target, targetX, targetY), getColor(getPixel(source, sourceX, sourceY)))
            targetY = targetY + 1
        targetX = targetX + 1
    return (target)

# this function is used to create slice 4
def grayscale():
    picture = makePicture(getMediaPath("ghost.jpg"))
    for x in range(600, 800):
        for y in range(0, getHeight(picture)):
            pixel = getPixel(picture, x, y)
            intensity = (getRed(pixel) + getGreen(pixel) + getBlue(pixel)) / 3
            setColor(pixel, makeColor(intensity, intensity, intensity))
    return (picture)
#this function is used to create slice 2

def posterize():
    picture = makePicture(getMediaPath("ghost.jpg"))
    for x in range(200, 400):
        for y in range(0, getHeight(picture)):
            px = getPixel(picture, x, y)
            if getRed(px) < 64:
                setRed(px, 31)
            if 63 < getRed(px) < 128:
                setRed(px, 95)
            if 127 < getRed(px) < 192:
                setRed(px, 159)
            if 191 < getRed(px) < 256:
                setRed(px, 223)
            if getGreen(px) < 64:
                setGreen(px, 31)
            if 63 < getGreen(px) < 128:
                setGreen(px, 95)
            if 127 < getGreen(px) < 192:
                setGreen(px, 159)
            if 191 < getGreen(px) < 256:
                setGreen(px, 223)
            if getBlue(px) < 64:
                setBlue(px, 31)
            if 63 < getBlue(px) < 128:
                setBlue(px, 95)
            if 127 < getBlue(px) < 192:
                setBlue(px, 159)
            if 191 < getBlue(px) < 256:
                setBlue(px, 223)
    return (picture)

#this function is used to create slice 3 and was created by me. I messed with the numbers in the range statements to make a cool pattern

def weirdPattern():
    secondPic = makePicture(getMediaPath("ghost.jpg"))
    picture = makeEmptyPicture(getWidth(secondPic), getHeight(secondPic), lightGray)
    for x in range(400, 600, 2):
        for y in range(0, getHeight(picture), 5):
            sourcePixelColor = getColor(getPixel(picture, x, y))
            setColor(getPixel(secondPic, x, y), sourcePixelColor)
        for x in range(400, 600, 5):
            for y in range(0, getHeight(picture), 2):
sourcePixelColor = getColor(getPixel(picture,x,y))
ssetColor(getPixel(secondPic,x,y),sourcePixelColor)
return (secondPic)

# this function is used to create slice 1
def blur():
    picture = makePicture(getMediaPath("ghost.jpg"))
    blurredPicture = duplicatePicture(picture)
    for x in range(1, getWidth(picture)-1):
        for y in range(1, getHeight(picture)-1):
            top = getPixel(picture,x,y-1)
            left = getPixel(picture,x-1,y)
            bottom = getPixel(picture,x,y+1)
            right = getPixel(picture,x+1,y)
            center = getPixel(blurredPicture,x,y)
            newRed=(getRed(top)+ getRed(left) + getRed(bottom) + getRed(right) + getRed(center))/5
            newGreen=(getGreen(top) + getGreen(left) + getGreen(bottom)+ getGreen(right)+getGreen(center))/5
            newBlue=(getBlue(top) + getBlue(left) + getBlue(bottom) + getBlue(right)+ getBlue(center))/5
            setColor(center, makeColor(newRed, newGreen, newBlue))
    return (blurredPicture)

# this function is used to create slice 5
def edgeDetect():
    picture = makePicture(getMediaPath("ghost.jpg"))
    for x in range(800,1000):
        for y in range(0,getHeight(picture)):
            px = getPixel(picture,x,y)
            if y < getHeight(picture)-1 and x < getWidth(picture)-1:
                botrt = getPixel(picture,x+1,y+1)
                thislum = luminance(px)
                brlum = luminance(botrt)
                if abs(brlum-thislum) > 10:
                    setColor(px,gray)
                if abs(brlum-thislum) <= 10:
                   setColor(px,lightGray)
    return (picture)

# this luminance function is only used in the edgeDetect function
def luminance(pixel):
    r = getRed(pixel)
    g = getGreen(pixel)
    b = getBlue(pixel)
    return (r+g+b)/3