# Ryan Schlechty 3/14/21

def collage():
    picture = makePicture(getMediaPath("groot2.jpg"))
    picture2 = makePicture(getMediaPath("groot2.jpg"))
    picture3 = makePicture(getMediaPath("groot2.jpg"))
    picture4 = makePicture(getMediaPath("groot2.jpg"))
    picture5 = makePicture(getMediaPath("groot2.jpg"))
    signature = makePicture(getMediaPath("signature.jpeg"))

    width = getWidth(picture)
    height = getHeight(picture)

    # first picture
    finished = makeEmptyPicture(1000, int(getHeight(picture) * 200.0 / width))
    canvas = makeEmptyPicture(200, int(getHeight(picture) * 200.0 / width), white)
    scale(picture, canvas, 200.0 / width)
    copyPicture(canvas, finished, 0, 0)

    # second picture
    picture = grayscale(picture)
    scale(picture, canvas, 200.0 / width)
    copyPicture(canvas, finished, 200, 0)

    # fifth picture
    colorSwap(picture2)
    canvas1 = makeEmptyPicture(200, int(getHeight(picture) * 200.0 / width), white)
    scale(picture2, canvas1, 200.0 / width)
    copyPicture(canvas1, finished, 800, 0)
# middle picture
threeWayGray(picture3)
verticalLines(picture3)
canvas2 = makeEmptyPicture(200, int(getHeight(picture)*200.0/width), white)  
scale(picture3, canvas2, 200.0/width)  
copyPicture(canvas2, finished, 400, 0)  

# fourth picture
mirrorSideways(picture4)  
colorSwap2(picture4)  
canvas3 = makeEmptyPicture(200, int(getHeight(picture)*200.0/width), white)  
scale(picture4, canvas3, 200.0/width)  
copyPicture(canvas3, finished, 600, 0)  

# signature

canvas4 = makeEmptyPicture(int(getWidth(signature)*.15), int(getHeight(signature)*.15), white)  
scale(signature, canvas4, .15)  
namename(canvas4, finished)  

show(finished)  

def copyPicture(picture, targett, targetX, targetY):
   targXX = targetX
   for x in range(0, getWidth(picture)):
      targYY = targetY
      for y in range(0, getHeight(picture)):
         px = getColor(getPixel(picture, x, y))  
         setColor(getPixel(targett, targXX, targYY), px)  
         targYY += 1
      targXX += 1
   return picture  

def scale(picture, big_picture, factor):
   sourceXX = 0
   for targetXX in range(0, int(getWidth(picture)*factor)):
      sourceYY = 0
      for targetYY in range(0, int(getHeight(picture)*factor)):
         srcpx = getPixel(picture, int(sourceXX), int(sourceYY))  
         color = getColor(srcpx)  
         setColor(getPixel(big_picture, targetXX, targetYY), color)  
         sourceYY = sourceYY + 1.0/factor
      sourceXX = sourceXX + 1.0/factor
def grayscale(picture):
    for p in getPixels(picture):
        intensity = (getRed(p)+getGreen(p)+getBlue(p))/3
        setColor(p,makeColor(intensity,intensity,intensity))
    return picture


def colorSwap(picture):
    for p in getPixels(picture):
        r = getRed(p)
        b = getBlue(p)
        g = getGreen(p)
        setRed(p,b)
        setBlue(p,g)
        setGreen(p,r)
    return picture


def colorSwap2(picture):
    for p in getPixels(picture):
        r = getRed(p)
        b = getBlue(p)
        g = getGreen(p)
        setRed(p,b)
        setBlue(p,r)
        setGreen(p,g)
    return picture


def threeWayGray(source):
    for px in getPixels(source):
        r = getRed(px)
        g = getRed(px)
        b = getBlue(px)
        luminance = (r+g+b)/3
        if luminance < 50:
            setColor(px,black)
        if luminance >= 50 and luminance <= 165:
            setColor(px,black)
        if luminance > 165:
            setColor(px,white)
def mirrorSideways(picture):
mirrorPoint = getWidth(picture)/2
width = getWidth(picture)
for x in range(0,mirrorPoint):
    for y in range(0,getHeight(picture)):
        leftPixel = getPixel(picture,x,y)
        rightPixel = getPixel(picture, width - x - 1,y)
        color = getColor(leftPixel)
        setColor(rightPixel,color)

def name(signature,picture):
    for px in getPixels(signature):
        XX = getX(px)
        YY = getY(px)
        if (getRed(px) < 140 and getGreen(px) < 140 and getBlue(px) < 140):
            bgPx = getPixel(picture5,XX+450,YY+145)
            setColor(bgPx,white)

def verticalLines(picture):
    for x in range(0,getWidth(picture),30):
        for y in range(0,getHeight(picture)):
            setColor(getPixel(picture,x,y),red)