def collage():
    image = makePicture(getMediaPath("SpaceGhost.jpg.jpg"))  # input parameters up here
    canvas = makeEmptyPicture(972,735)
    signature = makePicture(getMediaPath("signature.jpg.jpg"))
    ml(image,canvas)  # calls in all prior functions
    mm(image,canvas)
    mr(image,canvas)
    bl(image,canvas)
    bm(image,canvas)
    br(image,canvas)
    tl(image,canvas)
    tm(image,canvas)
    tr(image,canvas)
    bandw(image,canvas)
    ctropeB(image,canvas)
    ctropeR(image,canvas)
    ntive(image,canvas)
    charcoal(image,canvas)
    ctropeG(image,canvas)
    sepiatone(image,canvas)
    ctropeY(image,canvas)
    sig(signature,canvas)
    show(canvas)
    return(canvas)

# gets signature puts it at the top left and uses a chroma like distance function to
# "erase" the white background
def sig(signature,canvas):
    targetX = 0
    for sourceX in range(0,getWidth(signature)):
        targetY = 0
        for sourceY in range(0,getHeight(signature)):
            color = getColor(getPixel(signature,sourceX,sourceY))
            # where it says black this can be changed to any other color either using the
            # available colors or making your own
            if distance(color,black)<200:
                setColor(getPixel(canvas,targetX,targetY), color)
            targetY = targetY +1
        targetX = targetX +1

def mm(image,canvas):
    targetX = 324  # middle starts here
    for sourceX in range(0,getWidth(image)):
        targetY = 245
        for sourceY in range(0,getHeight(image)):
            color = getColor(getPixel(image,sourceX,sourceY))
            setColor(getPixel(canvas,targetX,targetY), color)
            targetY = targetY +1
targetX = targetX +1 #middle ends

def ml(image, canvas):
    targetX1 = 0 #middle left is here
    for sourceX in range(0, getWidth(image)):
        targetY1 = 245
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX1, targetY1), color)
        targetY1 = targetY1 +1
    targetX1 = targetX1 +1 #end middle left

def mr(image, canvas):
    targetX2 = 648 #middle right starts here
    for sourceX in range(0, getWidth(image)):
        targetY2 = 245
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX2, targetY2), color)
        targetY2 = targetY2 +1
    targetX2 = targetX2 +1 #end middle right

def bl(image, canvas):
    targetX3 = 0 #bottom left starts here
    for sourceX in range(0, getWidth(image)):
        targetY3 = 490
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX3, targetY3), color)
        targetY3 = targetY3 +1
    targetX3 = targetX3 +1 #bottom right ends here

def bm(image, canvas):
    targetX4 = 324 #bottom middle starts here
    for sourceX in range(0, getWidth(image)):
        targetY4 = 490
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX4, targetY4), color)
        targetY4 = targetY4 +1
    targetX4 = targetX4 +1 #bottom middle ends here

def br(image, canvas):
    targetX5 = 648 #bottom right starts here
    for sourceX in range(0, getWidth(image)):
        targetY5 = 490
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX5, targetY5), color)
        targetY5 = targetY5 +1
    targetX5 = targetX5 +1 #bottom right ends here

def tl(image, canvas):
    targetX6 = 0 #top right starts here
    for sourceX in range(0, getWidth(image)):
        targetY6 = 0
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX6, targetY6), color)
        targetY6 = targetY6 +1
def tm(image, canvas):
    targetX7 = 324  # top middle starts here
    for sourceX in range(0, getWidth(image)):
        targetY7 = 0
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX7, targetY7), color)
            targetY7 = targetY7 +1
        targetX7 = targetX7 +1  # top middle ends here

def tr(image, canvas):
    targetX8 = 648  # top right starts here
    for sourceX in range(0, getWidth(image)):
        targetY8 = 0
        for sourceY in range(0, getHeight(image)):
            color = getColor(getPixel(image, sourceX, sourceY))
            setColor(getPixel(canvas, targetX8, targetY8), color)
            targetY8 = targetY8 +1
        targetX8 = targetX8 +1  # top right ends here

def bandw(image, canvas):  # makes top middle image black and white
    for p in getPixels(canvas):
        x = getX(p)
        y = getY(p)
        # these if statements are on all of the next functions so the effect is only used
        # in the designated area
        if (x > 323 and x < 649) and (y > 0 and y < 244):
            intensity = (getRed(p)+getGreen(p)+getBlue(p))/3
            setColor(p, makeColor(intensity, intensity, intensity))

def ctropeB(image, canvas):  # makes a blue cyantrope in the top left quadrant
    for p in getPixels(canvas):
        x = getX(p)
        y = getY(p)
        if (x > 0 and x < 325) and (y > 0 and y < 246):
            intensity = (getRed(p)+getGreen(p)+getBlue(p))/3
            setColor(p, makeColor(intensity, intensity, intensity))
            # red green and blue ctropes are easy becausd they only use one color but we
            # will get to one later that requires some more finesse
            b = getBlue(p)
            if (b < 63):
                b = b*2
            if (b > 62 and b < 192):
                b = b*1.3
            if (b >191):
                b = b*1.2
            setBlue(p, b)
            setRed(p, (getRed(p)*.75))
            setGreen(p, (getGreen(p)*.75))

def ctropeR(image, canvas):  # cyantropes the top right quadr into red
    for p in getPixels(canvas):
        x = getX(p)
        y = getY(p)
        if (x > 648) and (y > 0 and y < 246):
            intensity = (getRed(p)+getGreen(p)+getBlue(p))/3
setColor(p,makeColor(intensity, intensity, intensity))
b = getRed(p)
if (b < 63):
    b = b*2
if (b > 62 and b < 192):
    b = b*1.3
if (b >191):
    b = b*1.2
setRed(p,b)
setBlue(p,(getBlue(p)*.75))
setGreen(p,(getGreen(p)*.75))

def ntive(image,canvas): #makes the middle left quad into negative
    for p in getPixels(canvas):
        x = getX(p)
y = getY(p)
        if (x > 0 and x < 325) and (y > 245 and y < 489):
            red=getRed(p)
green=getGreen(p)
blue=getBlue(p)
    #inverts all the colors of the pixels
    negcolor=makeColor(255-red, 255-green, 255-blue)
    #actually changes the color of the pixels to the negative values we set above
    setColor(p,negcolor)

#makes middle left quad image into an weird black and white charcoal like drawing

def charcoal(image,canvas):
    for p in getPixels(canvas):
        x = getX(p)
y = getY(p)
        if (x > 648) and (y > 245 and y < 489):
            r = getRed(p)
g = getGreen(p)
b = getBlue(p)
luminance = (r+g+b)/3
        if luminance < 64:
            setColor(p,black)
        if luminance>=64:
            setColor(p,white)

def ctropeG(image,canvas): #makes bottom left quad into a green cyantrope
    for p in getPixels(canvas):
        x = getX(p)
y = getY(p)
        if (x > 0 and x < 325) and (y > 490 and y < 736):
            intensity = (getRed(p)+getGreen(p)+getBlue(p))/3
            setColor(p,makeColor(intensity, intensity, intensity))
g = getGreen(p)
        if (g < 63):
            g = g*2
        if (g > 62 and g < 192):
            g = g*1.3
        if (g >191):
            g = g*1.2
        setGreen(p,g)
        setRed(p,(getRed(p)*.75))
        setBlue(p,(getBlue(p)*.75))

#makes bottom middle quad into a vintage sepia toned brownish look
def sepiatone(image, canvas):
    for p in getPixels(canvas):
        x = getX(p)
        y = getY(p)
        if (x > 324 and x < 649) and (y > 490 and y < 736):
            intensity = (getRed(p)+getGreen(p)+getBlue(p))/3
            setColor(p, makeColor(intensity, intensity, intensity))
            red = getRed(p)
            blue = getBlue(p)
            if (red < 63):
                red = red*1.1
                blue = blue*0.9
            if (red > 62 and red < 192):
                red = red*1.15
                blue = blue*0.85
            if (red > 191):
                red = red*1.8
            if (red > 255):
                red = 255
            blue = blue*0.93
            setBlue(p, blue)
            setRed(p, red)

def ctropeY(image, canvas):  # this was the one I was talking about above
    # this is the modification I struggled with the most and its the most significant
    # one as it wasn't in the book so it all came from me!
    for p in getPixels(canvas):
        x = getX(p)
        y = getY(p)
        if (x > 648) and (y > 490 and y < 736):
            g = getGreen(p)
            b = getRed(p)
            if (g < 63):
                g = g*2
            if (g > 62 and g < 192):
                g = g*1.5
            if (g > 191):
                g = g*1.3
            if (b < 63):
                b = b*2
            if (b > 62 and b < 192):
                b = b*1.5
            if (b > 191):
                b = b*1.3
            setRed(p, b)
            setGreen(p, g)
            setBlue(p, (getBlue(p)*.75))