#Sean Trzybinski, October 22 2021

def collage():
    setMediaPath()
    origenal = makePicture(getMediaPath("moon.jpg"))
    mod1 = makePicture(getMediaPath("moon.jpg"))
    mod2 = makePicture(getMediaPath("moon.jpg"))
    mod3 = makePicture(getMediaPath("moon.jpg"))
    mod4 = makePicture(getMediaPath("moon.jpg"))
    mod5 = makePicture(getMediaPath("moon.jpg"))
    mod6 = makePicture(getMediaPath("moon.jpg"))
    mod7 = makePicture(getMediaPath("moon.jpg"))
    mod8 = makePicture(getMediaPath("moon.jpg"))
    canvas = makeEmptyPicture(getWidth(origenal) * 2, getHeight(origenal) * 2)
    sig = makePicture(getMediaPath("sig.jpg"))
    sig = scaleDown(sig, 20)

    pic = scaleDown(origenal, 2)
    negative(mod1)
    pic1 = scaleDown(mod1, 2)
    lighten(mod2)
    pic2 = scaleDown(mod2, 2)
    darken(mod3)
    pic3 = scaleDown(mod3, 2)
    edge(mod4)
    pic4 = scaleDown(mod4, 2)
increaseRed(mod5)
increaseGreen(mod6)
pic6a = rotateleft(mod6)
pic6b = rotateleft(pic6a)
pic6c = rotateleft(pic6b)
increaseBlue(mod7)
pic7 = rotateleft(mod7)
grayScaleNew(mod8)
pic8a = rotateleft(mod8)
pic8b = rotateleft(pic8a)

copy(mod5, canvas, 0, 0)
copy(pic6c, canvas, getWidth(mod6), 0)
copy(pic7, canvas, 0, getHeight(mod7))
copy(pic8b, canvas, getWidth(mod8), getHeight(mod8))
copy(pic1, canvas, int(getWidth(canvas) / 2 - getWidth(pic1) / 2), getHeight(pic1)/2)
copy(pic2, canvas, int(getWidth(canvas) / 2 + getWidth(pic1) / 2), int(getHeight(canvas) / 2 - getHeight(pic1)/2))
copy(pic3, canvas, int(getWidth(canvas) / 2 - getWidth(pic1)*(3.0/2)), int(getHeight(canvas) / 2 - getHeight(pic1)/2))
copy(pic4, canvas, int(getWidth(canvas) / 2 - getWidth(pic1) / 2), int(getHeight(canvas) / 2 + getHeight(pic1)/2))

copy(pic, canvas, int(getWidth(canvas) / 2 - getWidth(pic) / 2), int(getHeight(canvas) / 2 - getHeight(pic)/2))

chromaSig(sig, canvas, 1000, 1050)
Final = scaleDown(canvas, 1.7)
show(Final)
writePictureTo(canvas, "Sean_Trzybinski.jpg")

def rotateleft(src):
    targetX = 0
    width = getWidth(src)
    canvas = makeEmptyPicture(getHeight(src), getWidth(src))
    for sourceX in range(0, getWidth(src)):
        targetY = 0
        for sourceY in range(0, getHeight(src)):
            color = getColor(getPixel(src, sourceX, sourceY))
            setColor(getPixel(canvas, targetY, width - targetX - 1), color)
            targetY += 1
        targetX += 1
    return(canvas)

def copy(pic, target, targX, targY):
    targetX = targX
    for x in range(getWidth(pic)):
        targetY = targY
        for y in range(getHeight(pic)):
            pixel = getPixel(pic, x, y)
tx = getPixel(target, targetX, targetY)
setColor(tx, getColor(pixel))
targetY += 1
targetX += 1

def scaleDown(pic, factor):
canvas = makeEmptyPicture(int(getWidth(pic) / factor), int(getHeight(pic) / factor))
scale(pic, canvas, 1.0 / factor)
return canvas

def scale(src, canvas, factor):
sourceX = 0
for targetX in range(0, int(getWidth(src) * factor)):
    sourceY = 0
    for targetY in range(0, int(getHeight(src) * factor)):
        color = getColor(getPixel(src, int(sourceX), int(sourceY)))
        setColor(getPixel(canvas, targetX, targetY), color)
        sourceY = sourceY + 1.0 / factor
    sourceX = sourceX + 1.0 / factor

def negative(pic):
    for each_pixel in getPixels(pic):
        r = getRed(each_pixel)
        b = getBlue(each_pixel)
        g = getGreen(each_pixel)
        neg = makeColor(255-r, 255-g, 255-b)
        setColor(each_pixel, neg)

def lighten(pic):
    for each_pixel in getPixels(pic):
        color = getColor(each_pixel)
        color = makeLighter(color)
        setColor(each_pixel, color)

def darken(pic):
    for p in getPixels(pic):
        color = getColor(p)
        color = makeDarker(color)
        color = makeDarker(color)
        setColor(p, color)

def edge(picture):
    for p in getPixels(picture):
        x =getX(p)
y = getY(p)
if y < getHeight(picture) - 1 and x < getWidth(picture) - 1:
    sum = getRed(p) + getGreen(p) + getBlue(p)
    botrt = getPixel(picture, x+1, y+1)
    sum2 = getRed(botrt) + getGreen(botrt) + getBlue(botrt)
    diff = abs(sum2-sum)
    newColor = makeColor(diff, diff, diff)
    setColor(p, newColor)

def increaseRed(picture):
    for pixel in getPixels(picture):
        value = getRed(pixel)
        setRed(pixel, value * 1.5)

def increaseGreen(picture):
    for pixel in getPixels(picture):
        value = getGreen(pixel)
        setGreen(pixel, value * 1.5)

def increaseBlue(picture):
    for pixel in getPixels(picture):
        value = getBlue(pixel)
        setBlue(pixel, value * 1.5)

def grayScaleNew(picture):
    for p in getPixels(picture):
        newRed = getRed(p) * .299
        newGreen = getGreen(p) * .587
        newBlue = getBlue(p) * .114
        luminance = newRed + newGreen + newBlue
        setColor(p, makeColor(luminance, luminance, luminance))

def chromaSig(source, target, targetX, targetY):
    for x in range(0, getWidth(source)):
        for y in range(0, getHeight(source)):
            p = getPixel(source, x, y)
            color = getColor(p)
            targ = getPixel(target, x + targetX, y +targetY)
            if distance (black, color) < 190:
                setColor(targ, makeColor(0, 255,255))

collage()