#functon used to scale picture down small enough to fit on canvas

def scaleDown(picture_in, picture_out):
    sourceX = 0
    for targetX in range(0, getWidth(picture_out)-2):
        sourceY = 0
        for targetY in range(0, getHeight(picture_out)-2):
            color = getColor(getPixel(picture_in, sourceX, sourceY))
            setColor(getPixel(picture_out, targetX, targetY), color)
            sourceY = sourceY + 2
            sourceX = sourceX + 2

#crops first section and pastes into canvas

def crop1(src, canvas):
    targetX = 0
    for sourceX in range(0, getWidth(src)/5):
        targetY = 0
        for sourceY in range(0, getHeight(src)):
            color = getColor(getPixel(src, sourceX, sourceY))
            setColor(getPixel(canvas, targetX, targetY), color)
            targetY = targetY + 1
            targetX = targetX + 1

#crops second section and pastes into canvas

def crop2(canvas, pic):
    targetBeginX = getWidth(pic)/5
    targetEndX = getWidth(pic)/5 * 2
    x = getWidth(pic)/5
    for x in range(targetBeginX, targetEndX):
        for y in range(0, getHeight(pic)):
            pixelsToCopy = getPixel(pic, x, y)
            copyColor = getColor(pixelsToCopy)
            setColor(getPixel(canvas, x, y), copyColor)
            y = y + 1
            x = x + 1

#crops third section and pastes into canvas

def crop3(canvas, pic):
    targetBeginX = getWidth(pic)/5 * 2
    targetEndX = getWidth(pic)/5 * 3
    x = getWidth(pic)/5 * 2
    for x in range(targetBeginX, targetEndX):
        for y in range(0, getHeight(pic)):
            pixelsToCopy = getPixel(pic, x, y)
            copyColor = getColor(pixelsToCopy)
            setColor(getPixel(canvas, x, y), copyColor)
            y = y + 1
x = x + 1

# crops fourth section and pastes into canvas
def crop4(canvas,pic):
    targetBeginX = getWidth(pic)/5 * 3
    targetEndX = getWidth(pic)/5 * 4
    x = getWidth(pic)/5 * 3
    for x in range(targetBeginX,targetEndX):
        for y in range(0,getHeight(pic)):
            pixelsToCopy = getPixel(pic,x,y)
            copyColor = getColor(pixelsToCopy)
            setColor(getPixel(canvas,x,y),copyColor)
            y = y + 1
            x = x + 1

# crops fifth section and pastes into canvas
def crop5(canvas,pic):
    targetBeginX = getWidth(pic)/5 * 4
    targetEndX = getWidth(pic)
    x = getWidth(pic)/5 * 4
    for x in range(targetBeginX,targetEndX):
        for y in range(0,getHeight(pic)):
            pixelsToCopy = getPixel(pic,x,y)
            copyColor = getColor(pixelsToCopy)
            setColor(getPixel(canvas,x,y),copyColor)
            y = y + 1
            x = x + 1

# swaps colors in photo
def swap(picture):
    for p in getPixels(picture):
        r = getRed(p)
        b = getBlue(p)
        g = getGreen(p)
        setRed (p,b)
        setBlue (p,g)
        setGreen(p,r)

# removes color from photo
def grayScale(picture):
    for p in getPixels(picture):
        intensity = (getRed(p)+getGreen(p)+getBlue(p))/3
        setColor (p,makeColor(intensity,intensity,intensity))

# removes color from photo, then adds a sepia tone
def sepiaTone(picture):
    grayScale(picture)
    for p in getPixels(picture):
        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 * 1.08
        if(red > 255):
            red = 255
blue = blue * 0.93
setBlue(p,blue)
setRed(p,red)

# posterizes photo with 3 colors
def posterize3(source):
    for p in getPixels(source):
        r = getRed(p)
        g = getGreen(p)
        b = getBlue(p)
        luminance = (r+g+b)/3
        if luminance < 75:
            setColor(p,black)
        if luminance > 75 > 200:
            setColor(p,gray)
        if luminance > 200:
            setColor(p,white)

# main function that commands all of the rest of the functions
def collage():
    pic = makePicture(getMediaPath('charlie3.jpg'))
    small_pic = makeEmptyPicture(736,1000)
    small_pic2 = makeEmptyPicture(736,1000)
    small_pic3 = makeEmptyPicture(736,1000)
    small_pic4 = makeEmptyPicture(736,1000)
    small_pic5 = makeEmptyPicture(736,1000)
    canvas = makeEmptyPicture(736,1000)
    test = makeEmptyPicture(736,1000)
    scaleDown(pic,small_pic)
    scaleDown(pic,small_pic2)
    scaleDown(pic,small_pic3)
    scaleDown(pic,small_pic4)
    scaleDown(pic,small_pic5)
    swap(small_pic)
    crop1(small_pic,canvas)
    grayScale(small_pic2)
    crop2(canvas,small_pic2)
    crop3(canvas,small_pic3)
    sepiaTone(small_pic4)
    crop4(canvas,small_pic4)
    posterize3(small_pic5)
    crop5(canvas,small_pic5)
    explore(canvas)