def collage():
    #serves as the main function
    picture = makePicture(getMediaPath("planepic.jpg"))
    finalPicture = makeEmptyPicture(getWidth(picture),getHeight(picture))
    height = getHeight(picture)
    width = getWidth(picture)
    sliceWidth = width/5
    #dividing the picture into 5 separate pieces
    negative(picture,finalPicture,0,sliceWidth,height)
    #first piece (from left to right), with negative filter
    grayscale(picture,finalPicture,sliceWidth,sliceWidth*2,height)
    #second piece, with grayscale filter
    originalSlice(picture,finalPicture,sliceWidth*2,sliceWidth*3,height)
    #third piece, with no filter, just copied from original image
    darken(picture,finalPicture,sliceWidth*3,sliceWidth*4,height)
    #fourth piece, with filter that darkens the colors
    sepia(picture,finalPicture,sliceWidth*4,width,height)
    #final piece, with sepia filter

def originalSlice(picture,finalPicture,barStart,barStop,height):
    #copy and pastes a designated section from the original image and pastes it in the same spot on the new canvas
    newX = barStart
    for x in range(barStart,barStop):
        for y in range(0,height):
            pixel = getPixel(picture,x,y)
            newPx = getPixel(finalPicture,newX,y)
            setColor(newPx,getColor(pixel))
            newX = newX +1
    repaint(finalPicture)

def negative(picture,finalPicture,barStart,barStop,height):
    #puts a negative filter on a designated section from original image and pastes it in the same spot on the new canvas
    newX = barStart
    for x in range(barStart,barStop):
        for y in range(0,height):
            px = getPixel(picture,x,y)
            newPx = getPixel(finalPicture,newX,y)
            red = getRed(px)
            green = getGreen(px)
            blue = getBlue(px)
            negColor = makeColor(255-red,255-green,255-blue)
            setColor(newPx,negColor)
            newX = newX +1
repaint(finalPicture)

def grayscale(picture, finalPicture, barStart, barStop, height):
    # puts a grayscale filter on a designated section from original image and
    # pastes it in the same spot on the new canvas
    newX = barStart
    for x in range(barStart, barStop):
        for y in range(0, height):
            px = getPixel(picture, x, y)
            newPx = getPixel(finalPicture, newX, y)
            intensity = (getRed(px) + getGreen(px) + getBlue(px)) / 3
            setColor(newPx, makeColor(intensity, intensity, intensity))
            newX = newX + 1
    repaint(finalPicture)

def darken(picture, finalPicture, barStart, barStop, height):
    # darkens the colors on a designated section from original image and
    # pastes it in the same spot on the new canvas
    newX = barStart
    for x in range(barStart, barStop):
        for y in range(0, height):
            px = getPixel(picture, x, y)
            newPx = getPixel(finalPicture, newX, y)
            color = getColor(px)
            color = makeDarker(color)
            setColor(newPx, color)
            newX = newX + 1
    repaint(finalPicture)

def sepia(picture, finalPicture, barStart, barStop, height):
    # puts a sepia filter on a designated section from original image and
    # pastes it in the same spot on the new canvas
    # first grayscales the image using the same input
    grayscale(picture, finalPicture, barStart, barStop, height)
    newX = barStart
    for x in range(barStart, barStop):
        for y in range(0, height):
            px = getPixel(picture, x, y)
            newPx = getPixel(finalPicture, newX, y)
            red = getRed(px)
            blue = getBlue(px)
            # shadows
            if (red < 63):
                red = red * 1.1
                blue = blue * 0.9
            # midtones
            if (red > 62 and red < 192):
                red = red * 1.15
                blue = blue * 0.85
            # highlights
            if (red > 191):
                red = red * 1.08
            if (red > 255):
                red = 255
                blue = blue * 0.93
            setBlue(newPx, blue)
            setRed(newPx, red)
            newX = newX + 1
    repaint(finalPicture)