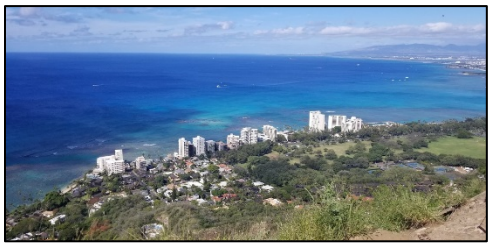
Billie Wellman

Completed

Original



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#Collage
#Coded by Billie Wellman
#Submitted 9 March 2020

#FOR SEPIA IMG

#grayscale prgm
def grayScale(picture):
  for px in getPixels(picture):
    newRed = getRed(px) * 0.299
    newGreen = getGreen(px) * 0.587
    newBlue = getBlue(px) * 0.114
    luminance = newRed + newGreen + newBlue
    setColor(px,makeColor(luminance,luminance,luminance))

#sepia prgm
def sepiaTint(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)

#USED IN POSTERIZE, EDGE DETECT

#luminance calculator
def luminance(pixel):
    r = getRed(pixel)
    g = getGreen(pixel)
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    b = getBlue(pixel)
    return (r+g+b)/3

#FOR POSTERIZED IMG

#posterize to black, white, grey
def blackWhiteGrey(picture):
  for p in getPixels(picture):
    luminancepx = luminance(p)
    if (luminancepx < 80):
      setColor(p,black)
    elif (luminancepx > 120):
      setColor(p,white)
    else:
      color = makeColor(128,128,128)
      setColor(p,color)

#FOR LINE DRAWING IMG

#edge detection line drawing
def edgeDetect(picture):
  for px in getPixels(picture):
    x = getX(px)
    y = getY(px)
    if y < getHeight(picture)-1 and x < getWidth(picture)-1:
      botrt = getPixel(picture,x+1,y+1)
      thislum = luminance(px)
      brlum = luminance(botrt)
      if abs(brlum-thislum) > 10:
        setColor(px,black)
      if abs(brlum-thislum) <= 10:
        setColor(px,white)

#FOR RAINBOW LINES IMG

#make horizontal lines
def horizontalLines(picture,start,count,color):
  for x in range(start,getHeight(picture),count):
    for y in range(0,getWidth(picture)):
      setColor(getPixel(picture,y,x),color)

#make vertical lines
def verticalLines(picture,start,count,color):
  for x in range(start,getWidth(picture),count):
    for y in range(0,getHeight(picture)):
      setColor(getPixel(picture,x,y),color)

#rainbow lines!
def rainbowLines(picture):
  indigo = makeColor(29,0,51)
  violet = makeColor(106,13,173)
  verticalLines(picture,0,35,red)
  verticalLines(picture,5,35,orange)
  verticalLines(picture,10,35,yellow)
  verticalLines(picture,15,35,green)
  verticalLines(picture,20,35,blue)
  verticalLines(picture,25,35,indigo)
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  verticalLines(picture,30,35,violet)
  horizontalLines(picture,0,35,red)
  horizontalLines(picture,5,35,orange)
  horizontalLines(picture,10,35,yellow)
  horizontalLines(picture,15,35,green)
  horizontalLines(picture,20,35,blue)
  horizontalLines(picture,25,35,indigo)
  horizontalLines(picture,30,35,violet)
  return picture

#GENERAL USE

#image scaling
def scale(picture_in,picture_out,factor):
  inX = 0
  for outX in range(0,(getWidth(picture_in) * (1.0 * factor))):
    inY = 0
    for outY in range(0,(getHeight(picture_in) * (1.0 * factor))):
      inpx = getPixel(picture_in,int(inX),int(inY))
      color = getColor(inpx)
      setColor(getPixel(picture_out,outX,outY),color)
      inY = inY + (1.0 / factor)
    inX = inX + (1.0 / factor)

#image copying
def copyPicture(picture_in,picture_out,targ_x,targ_y):
  targetX = targ_x
  for sourceX in range(0, getWidth(picture_in)):
    targetY = targ_y
    for sourceY in range(0,getHeight(picture_in)):
      color = getColor(getPixel(picture_in,sourceX,sourceY))
      setColor(getPixel(picture_out,targetX,targetY),color)
      targetY = targetY + 1
    targetX = targetX + 1

#COPY SIGNATURE

#signature chromakey
def copyWithChromakey(picture_in,picture_out,targ_x,targ_y):
  targetX = targ_x
  for sourceX in range(0, getWidth(picture_in)):
    targetY = targ_y
    for sourceY in range(0,getHeight(picture_in)):
      pixel = getPixel(picture_in,sourceX,sourceY)
      lum = luminance(pixel)
      if (lum < 150):
        setColor(getPixel(picture_out,targetX,targetY),cyan)
      targetY = targetY + 1
    targetX = targetX + 1

#MAIN FUNCTION
def collage():
  picture = makePicture(getMediaPath("honolulu.jpg"))
  width = getWidth(picture)
  height = getHeight(picture)
  canvas = makeEmptyPicture(width,height)
  copyPicture(picture,canvas,0,0)
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picture2 = makeEmptyPicture(int(width * 0.8),int(height * 0.8))
scale(picture,picture2,0.8)
rainbowLines(picture2)
copyPicture(picture2,canvas,int(width * 0.1),int(height * 0.1))
picture3 = makeEmptyPicture(int(width * 0.6),int(height * 0.6))
scale(picture,picture3,0.6)
sepiaTint(picture3)
copyPicture(picture3,canvas,int(width * 0.2),int(height * 0.2))
picture4 = makeEmptyPicture(int(width * 0.4),int(height * 0.4))
scale(picture,picture4,0.4)
blackWhiteGrey(picture4)
copyPicture(picture4,canvas,int(width * 0.3),int(height * 0.3))
picture5 = makeEmptyPicture(int(width * 0.2),int(height * 0.2))
scale(picture,picture5,0.2)
edgeDetect(picture5)
copyPicture(picture5,canvas,int(width * 0.4),int(height * 0.4))
signature = makePicture(getMediaPath("signature.jpeg"))
copyWithChromakey(signature,canvas,750,440)
show(canvas)
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