Turtle 艺术

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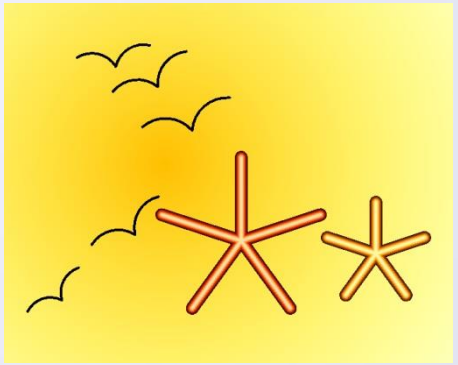
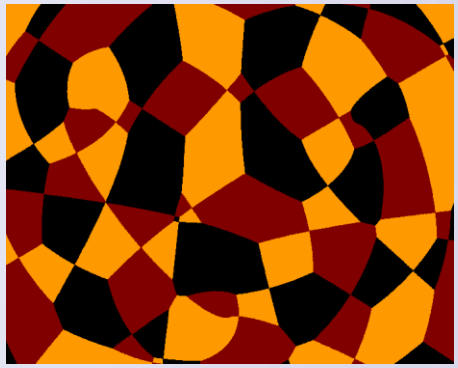
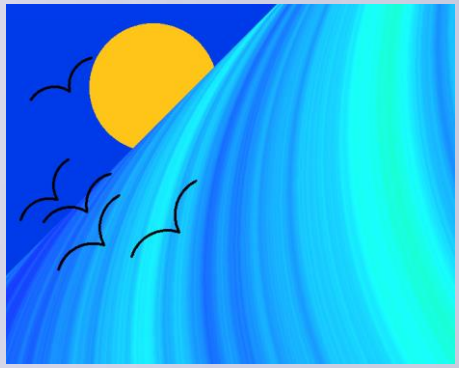
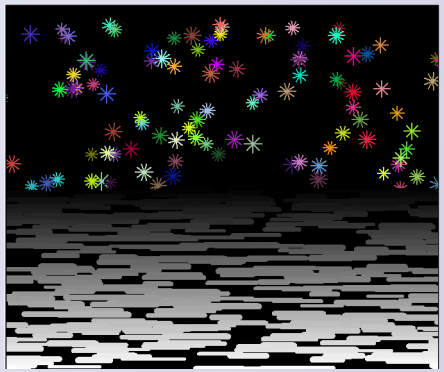
python 语言程序设计

Turtle Art 赏析









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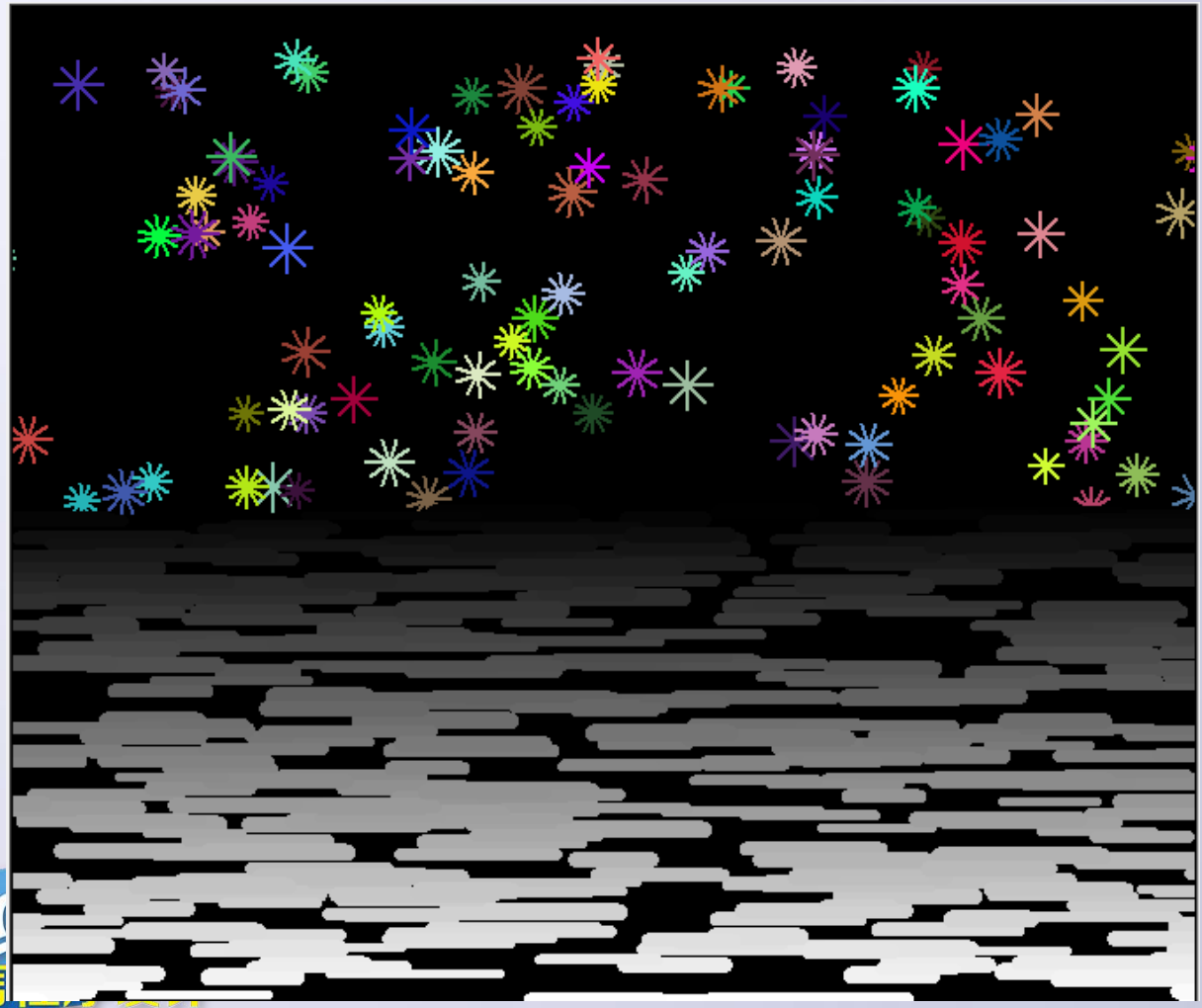
《雪景-Snowfall》绘制



- 随机因素：
  - 雪花位置
  - 雪花颜色
  - 雪花大小
  - 花瓣数目
  - 地面灰色长短
  - 地面灰色位置

引入Turtle和random

```
from turtle import *
from random import *
```

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主函数

```
def main():
    setup(800, 600, 0, 0)
    tracer(False)
    bgcolor("black")
    snow()
    ground()
    tracer(True)
    mainloop()
```

snow()函数

```
def snow():
    hideturtle()
    pensize(2)
    speed(100)
    for i in range(100):
        r = random()
        g = random()
        b = random()
        pencolor(r, g, b)
        penup()
        setx(randint(-350,350))
        sety(randint(1,270))
        pendown()
        dens = randint(8,12)
        snowsize = randint(10,14)
        for j in range(dens):
            forward(snowsize)
            backward(snowsize)
            right(360/dens)
```

ground()函数

```
def ground():
    hideturtle()
    speed(100)
    for i in range(400):
        pensize(randint(5,10))
        x = randint(-400,350)
        y = randint(-280,-1)
        r = -y/280
        g = -y/280
        b = -y/280
        pencolor((r, g, b))
        penup()
        goto(x,y)
        pendown()
        forward(randint(40,100))
```

主函数

```
def main():
    setup(800, 600, 0, 0)
    tracer(False)
    bgcolor("black")
    snow()
    ground()
    tracer(True)
    mainloop()
```

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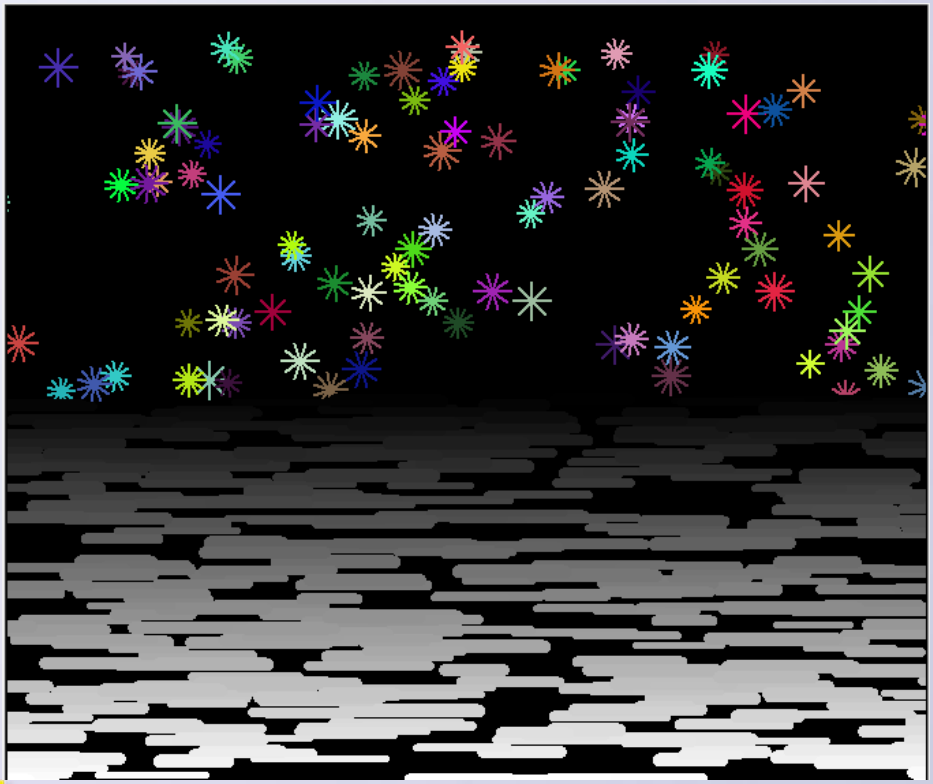
程序Python代码见Snowfall.py



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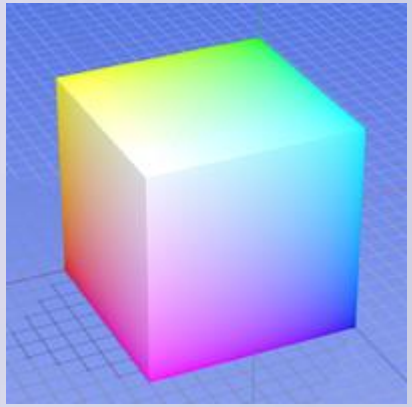
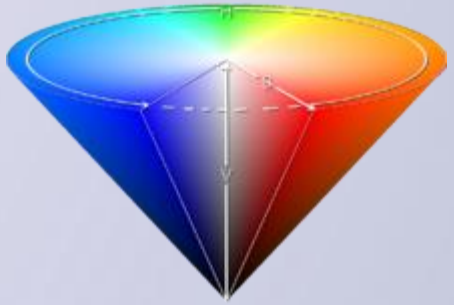
《Rainbow》绘制

颜色空间

- RGB模型：
  - 光的三原色
  - 色相由RGB共同决定



- HSV模型：
  - H色彩、 S深浅、V明暗
  - 色相由H决定



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色彩转换函数HSB2RGB()

- 色相hues换算为rgb值

```
def HSB2RGB(hues):
    hues = hues * 3.59 #100转成359范围
    rgb=[0.0,0.0,0.0]
    i = int(hues/60)%6
    f = hues/60 -i
    if i == 0:
        rgb[0] = 1; rgb[1] = f; rgb[2] = 0
    elif i == 1:
        rgb[0] = 1-f; rgb[1] = 1; rgb[2] = 0
    elif i == 2:
        rgb[0] = 0; rgb[1] = 1; rgb[2] = f
    elif i == 3:
        rgb[0] = 0; rgb[1] = 1-f; rgb[2] = 1
    elif i == 4:
        rgb[0] = f; rgb[1] = 0; rgb[2] = 1
    elif i == 5:
        rgb[0] = 1; rgb[1] = 0; rgb[2] = 1-f
    return rgb
```

rainbow（ ）函数

```
def rainbow():
    hues = 0.0
    color(1,0,0)
    #绘制彩虹
    hideturtle()
    speed(100)
    pensize(3)
    penup()
    goto(-400,-300)
    pendown()
    right(110)
    for i in range (100):
        circle(1000)
        right(0.13)
        hues = hues + 1
        rgb = HSB2RGB(hues)
        color(rgb[0],rgb[1],rgb[2])
    penup()
```

主函数

```
def main():
    setup(800, 600, 0, 0)
    bgcolor((0.8, 0.8, 1.0))
    tracer(False)
    rainbow()
    #输出文字
    goto(100,-100)
    pendown()
    color("red")
    write("Rainbow",align="center", font=("Script MT Bold", 80, "bold"))
    tracer(True)
    mainloop()
```

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Congratulations!

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程序Python代码见Rainbow.py