2018-2019学年第2学期素质教育公选课

《Python语言程序设计》课程期末设计

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一、设计思路：

实现蛇、事物的显示，通过draw实现

实现蛇的增长，通过坐标增加，移动一个点，就将该点设为头，若该点为食物点，则不做操作，否则删除尾部。

实现蛇的方向，通过KEYDOWN的值

蛇的死亡：撞到墙或者自身

食物随机出现：时钟对象，random模块

背景的实现：pygame.image.load(file\_name )

二、代码及注释

import random

import pygame

import sys

from pygame.locals import \*

snake\_speed =15

windows\_width = 800

windows\_height = 600

cell\_size = 20 #贪吃蛇身体方块大小

map\_width=int(windows\_width/cell\_size)

map\_height=int(windows\_height/cell\_size)

#定义颜色

white=(255,255,255)

black=(0,0,0)

gray = (230, 230, 230)

dark\_gray = (40, 40, 40)

dark\_green = (0, 155, 0)

green = (0, 255, 0)

red = (255, 0, 0)

blue = (0, 0, 255)

dark\_blue =(0,0, 139)

#定义方向

UP=1

DOWN=2

LEFT=3

RIGHT=4

HEAD=0 #贪吃蛇头部下标

def main():

pygame.init() #init

snake\_speed\_clock=pygame.time.Clock()#创建pygame的时钟对象

screen=pygame.display.set\_mode((windows\_width,windows\_height)) #创建屏幕

screen.fill(white)

pygame.display.set\_caption('小王的超级贪吃蛇游戏') #设置标题

show\_start\_info(screen) #欢迎信息

while True:

running\_game(screen, snake\_speed\_clock)

show\_gameover\_info(screen)

def running\_game(screen,snake\_speed\_clock):

startx=random.randint(3,map\_width-8)

starty=random.randint(3,map\_height-8) #randint(a,b)生成a,b之间的一个任意数

snake\_coords=[{"x":startx,'y':starty}, {'x': startx - 1, 'y': starty}, {'x': startx - 2, 'y': starty}]

#初始身体坐标

direction =RIGHT #c初始移动速度为RIGHT

food = get\_random\_location() #事物的随机位置

background=pygame.image.load('beijing.jpeg').convert()

while True:

for event in pygame.event.get():

if event.type ==QUIT:

terminate()#用户按下关闭时，退出游戏

elif event.type ==KEYDOWN:#按下键盘时

if(event.key==K\_LEFT or event.key == K\_a)and direction!=RIGHT:

direction=LEFT

elif(event.key==K\_RIGHT or event.key == K\_d)and direction!=LEFT:

direction=RIGHT

elif(event.key==K\_UP or event.key == K\_w)and direction!=DOWN:

direction=UP

elif(event.key==K\_DOWN or event.key == K\_s)and direction!=UP:

direction=DOWN

elif event.key==K\_ESCAPE:#键入esc退出

terminate()

move\_snake(direction,snake\_coords)

#移动蛇

ret = snake\_is\_alive(snake\_coords)

if not ret :

break #蛇死了，游戏结束，下一轮

snake\_is\_eat\_food(snake\_coords,food)

#判断蛇是否吃到food

screen.blit(background,(0,0))

#draw\_grid(screen)

draw\_snake(screen,snake\_coords)

draw\_food(screen,food)

draw\_score(screen,len(snake\_coords)-3)#初始长度3

pygame.display.update()

snake\_speed\_clock.tick(snake\_speed)#设置最高帧率为snake\_speed

def draw\_food(screen,food):

x=food['x']\*cell\_size

y=food['y']\*cell\_size

appleRect=pygame.Rect(x,y,cell\_size,cell\_size)

pygame.draw.rect(screen,red,appleRect)

appleinnerRect=pygame.Rect(x+3,y+3,cell\_size-7,cell\_size-7)

pygame.draw.rect(screen,dark\_green,appleinnerRect)

def draw\_snake(screen,snake\_coords):

for coord in snake\_coords:

x=coord['x']\*cell\_size

y=coord['y']\*cell\_size

woemSegmentRect=pygame.Rect(x,y,cell\_size,cell\_size)

pygame.draw.rect(screen,dark\_blue,woemSegmentRect)

woeminnerSegmentRect=pygame.Rect(x+4,y+4,cell\_size-8,cell\_size-8)

pygame.draw.rect(screen,blue,woeminnerSegmentRect)

#画网格

#def draw\_grid(screen):

def move\_snake(direction,snake\_coords):

if direction ==UP:

newHead={'x': snake\_coords[HEAD]['x'], 'y': snake\_coords[HEAD]['y'] - 1}

elif direction == DOWN:

newHead = {'x': snake\_coords[HEAD]['x'], 'y': snake\_coords[HEAD]['y'] + 1}

elif direction == LEFT:

newHead = {'x': snake\_coords[HEAD]['x'] - 1, 'y': snake\_coords[HEAD]['y']}

elif direction == RIGHT:

newHead = {'x': snake\_coords[HEAD]['x'] + 1, 'y': snake\_coords[HEAD]['y']}

snake\_coords.insert(0,newHead)#插入头

def snake\_is\_alive(snake\_coords):

tag=True

if snake\_coords[HEAD]['x'] == -1 or snake\_coords[HEAD]['x'] == map\_width or snake\_coords[HEAD]['y'] == -1 or \

snake\_coords[HEAD]['y'] == map\_height:

tag = False # 蛇碰壁啦

for snake\_body in snake\_coords[1:]:

if snake\_body['x'] == snake\_coords[HEAD]['x'] and snake\_body['y'] == snake\_coords[HEAD]['y']:

tag = False # 蛇碰到自己身体啦

return tag

def snake\_is\_eat\_food(snake\_coords,food):

if snake\_coords[HEAD]['x'] == food['x'] and snake\_coords[HEAD]['y'] == food['y']:

food['x'] = random.randint(0, map\_width - 1)

food['y'] = random.randint(0, map\_height - 1) # 实物位置重新设置

else:

del snake\_coords[-1] # 如果没有吃到实物, 就向前移动, 那么尾部一格删掉

#食物随机生成

def get\_random\_location():

return {'x': random.randint(0, map\_width - 1), 'y': random.randint(0, map\_height - 1)}

#开始信息

def show\_start\_info(screen):

font = pygame.font.Font('myfont.ttf',40)

tip = font.render('按任意键开始游戏!',True,(0,0,0))

tip1 = font.render('小王的贪吃蛇', True, (0, 0, 0))

gamestart =pygame.image.load('start.tif')

screen.blit(gamestart,(60,30))

screen.blit(tip,(250,550))

screen.blit(tip1, (280, 480))

pygame.display.update()

while True:

for event in pygame.event.get():

if event.type==QUIT:

terminate()

elif event.type ==K\_ESCAPE:

terminate()

elif event.type==KEYDOWN:

return

#结束信息

def show\_gameover\_info(screen):

font=pygame.font.Font('myfont.ttf',40)

tip = font.render('按Q或ESC退出游戏，按任意键重新开始游戏！',True,(65,105,225))

gameover =pygame.image.load('gameover.png')

screen.blit(gameover,(100,100))

screen.blit(tip,(80,450))

pygame.display.update()

while True:

for event in pygame.event.get():

if event.type == QUIT:

terminate() # 终止程序

elif event.type == KEYDOWN:

if event.key == K\_ESCAPE or event.key == K\_q: # 终止程序

terminate() # 终止程序

else:

return # 结束此函数, 重新开始游戏

def draw\_score(screen,score):

font = pygame.font.Font('myfont.ttf', 30)

scoreSurf = font.render('得分: %s' % score, True, green)

scoreRect = scoreSurf.get\_rect()

scoreRect.topleft = (windows\_width - 120, 10)

screen.blit(scoreSurf, scoreRect)

#程序终止

def terminate():

pygame.quit()

sys.exit()

main()

三、游戏运行截图：



