Wormy Game

https://github.com/zhihongzeng2002/pythongame

Game Begin

In the middle of game

Rules:
1. Eat the apple
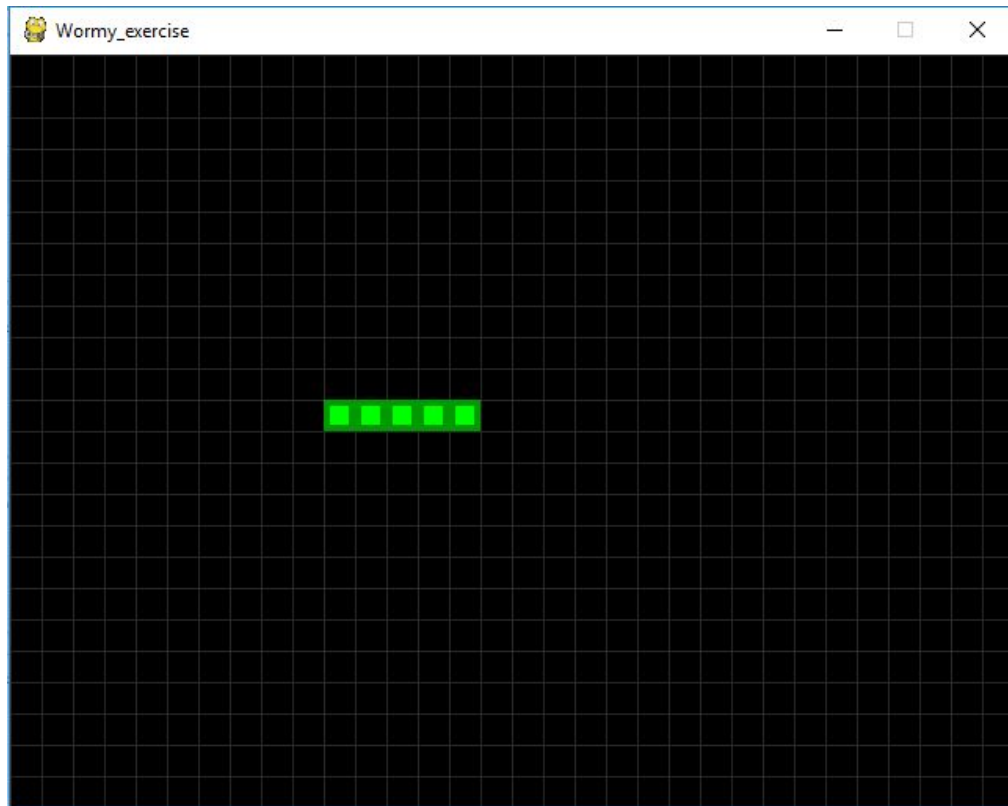2. Don't hit the wall
3. Don't hit worm body

Game over

Game Time: 10 minutes

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Winner: the highest score

Project 1: Training mode

Code: setup

```python
import random, pygame, sys
from pygame.locals import *

FPS = 5
WINDOWWIDTH = 640
WINDOWHEIGHT = 480
CELLSIZE = 20
CELLWIDTH = int(WINDOWWIDTH / CELLSIZE)
CELLHEIGHT = int(WINDOWHEIGHT / CELLSIZE)

#                   R    G    B
BGCOLOR     = (   0,   0,    0)
GREEN       = (   0, 255,    0)
DARKGREEN = (   0, 155,    0)
DARKGRAY  = (  40,  40,   40)

UP = 'up'
DOWN = 'down'
LEFT = 'left'
RIGHT = 'right'

HEAD = 0 # index of the worm's head
```

Main function

```python
def main():
    global FPSCLOCK, DISPLAYSURF, BASICFONT

    pygame.init()
    FPSCLOCK = pygame.time.Clock()
    DISPLAYSURF = pygame.display.set_mode((WINDOWWIDTH, WINDOWHEIGHT))
    pygame.display.set_caption('Wormy_exercise')

    runGame()
```

Data structure of worm

```python
def runGame():
    startx = random.randint(7, CELLWIDTH - 6)
    starty = random.randint(7, CELLHEIGHT - 6)
    wormCoords = [[startx, starty], [startx-1, starty],
        [startx-2, starty], [startx-3, starty], [startx-4, starty]]
    HEAD = 0
    direction = RIGHT
```


4	3	2	1	0
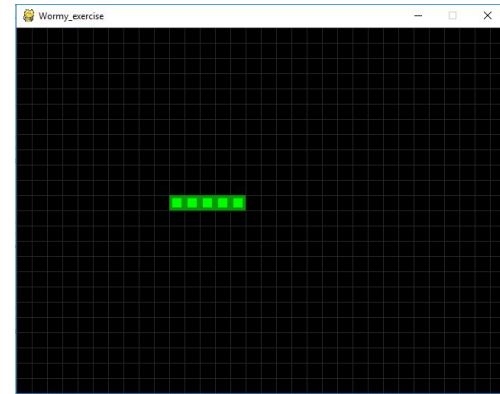
Main Loop: Event check

```python
while True: # main game loop
    for event in pygame.event.get():
        if event.type == QUIT:
            terminate()
        elif event.type == KEYDOWN:
            if event.key == K_LEFT and direction != RIGHT:
                direction = LEFT
            elif event.key == K_RIGHT and direction != LEFT:
                direction = RIGHT
            elif event.key == K_UP and direction != DOWN:
                direction = UP
            elif event.key == K_DOWN and direction != UP:
                direction = DOWN
            else:
                break
```

Worm movement

```python
if direction == UP:
    newHead = [wormCoords[HEAD][0], wormCoords[HEAD][1]-1]
elif direction == DOWN:
    newHead = [wormCoords[HEAD][0], wormCoords[HEAD][1]+1]
elif direction == LEFT:
    newHead = [wormCoords[HEAD][0]-1, wormCoords[HEAD][1]]
elif direction == RIGHT:
    newHead = [wormCoords[HEAD][0]+1, wormCoords[HEAD][1]]

if newHead[0] >= 0 and newHead[0] < CELLWIDTH and \
        newHead[1] >= 0 and newHead[1] < CELLHEIGHT:
    wormCoords.insert(0, newHead)
    del wormCoords[-1]
```

4	3	2	1	0	new

Main Loop: rendering

```
DISPLAYSURF.fill(BGCOLOR)
drawGrid()
drawWorm(wormCoords)
pygame.display.update()
FPSCLOCK.tick(FPS)
```

```python
def drawWorm(wormCoords):
    for coord in wormCoords:
        x = coord[0] * CELLSIZE
        y = coord[1] * CELLSIZE
        wormSegmentRect = pygame.Rect(x, y, CELLSIZE, CELLSIZE)
        pygame.draw.rect(DISPLAYSURF, DARKGREEN, wormSegmentRect)
        wormInnerSegmentRect = pygame.Rect(x + 4, y + 4, CELLSIZE - 8, CELLSIZE - 8)
        pygame.draw.rect(DISPLAYSURF, GREEN, wormInnerSegmentRect)
```

```python
def drawGrid():
    for x in range(0, WINDOWWIDTH, CELLSIZE): # draw vertical lines
        pygame.draw.line(DISPLAYSURF, DARKGRAY, (x, 0), (x, WINDOWHEIGHT))
    for y in range(0, WINDOWHEIGHT, CELLSIZE): # draw horizontal lines
        pygame.draw.line(DISPLAYSURF, DARKGRAY, (0, y), (WINDOWWIDTH, y))
```