suanlab

이수안 컴퓨터 연구소

suan computer laboratory

파이썬 게임 만들기

이수안

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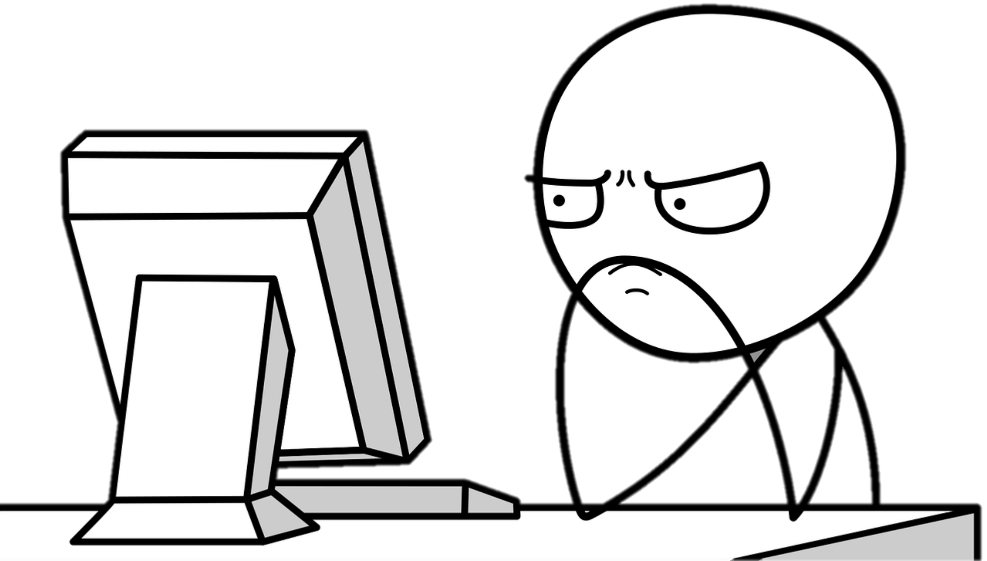
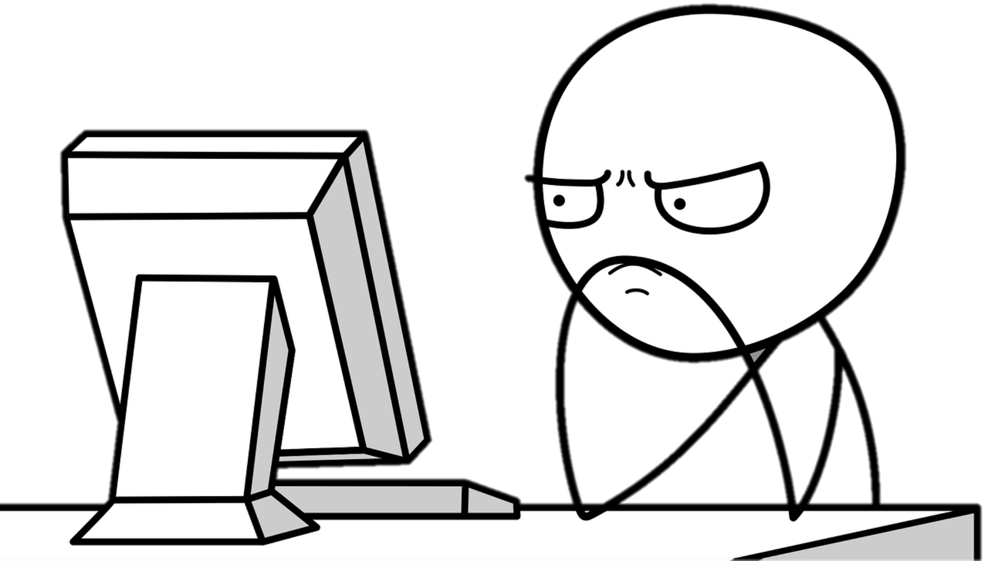
1. 파이썬 게임



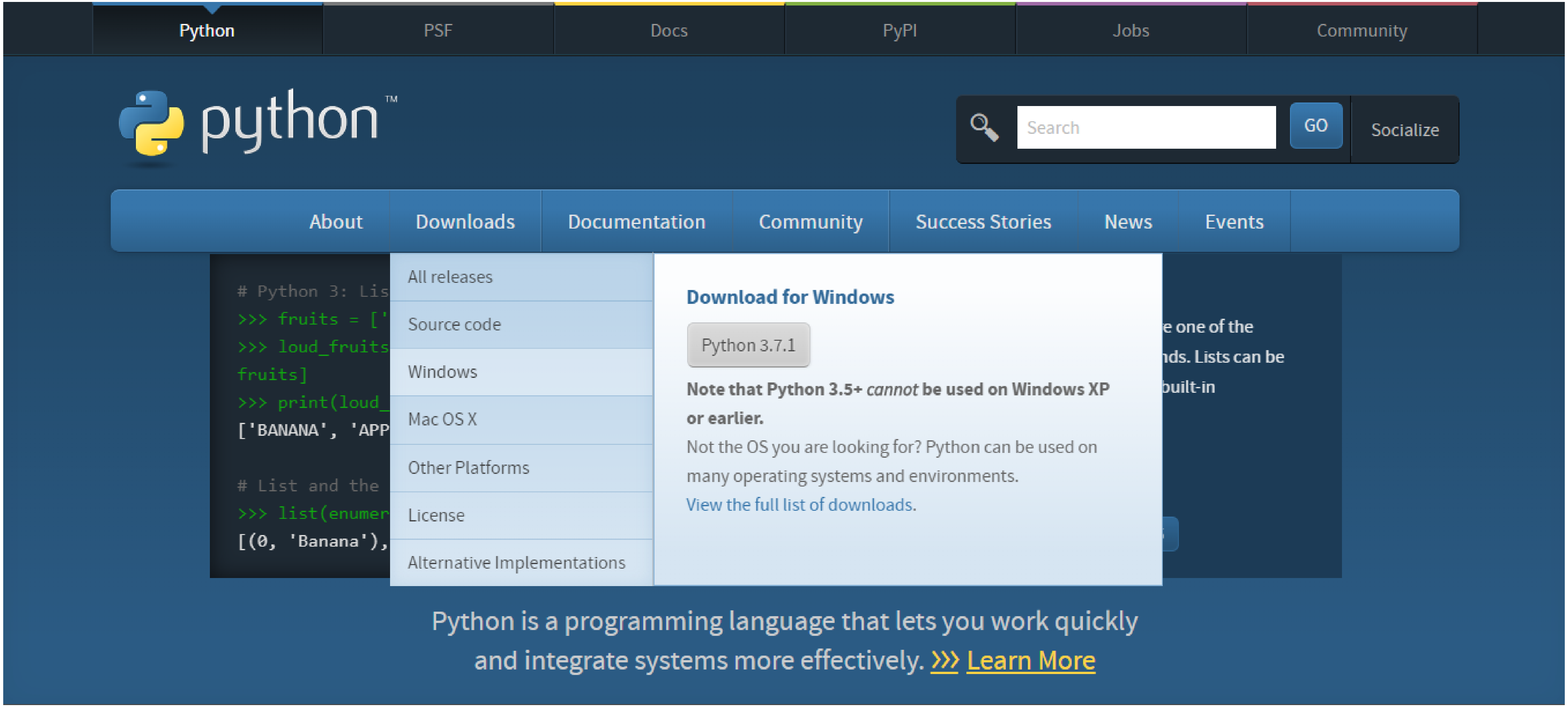
Python Game

- 파이썬 언어를 이용하여 파이썬 게임 만들기
- 파이썬Python의 사전적인 뜻은 고대 신화 속의 파르나수스Parnassus 산의 동굴에 살던 큰 뱀

2. Python 설치



Python 다운로드



```
# Python 3: Lis
>>> fruits = ['
>>> loud_fruits
fruits]
>>> print(loud_
['BANANA', 'APP

# List and the
>>> list(enumer
[(0, 'Banana'),
```

e one of the
nds. Lists can be
built-in

Download for Windows

Python 3.7.1

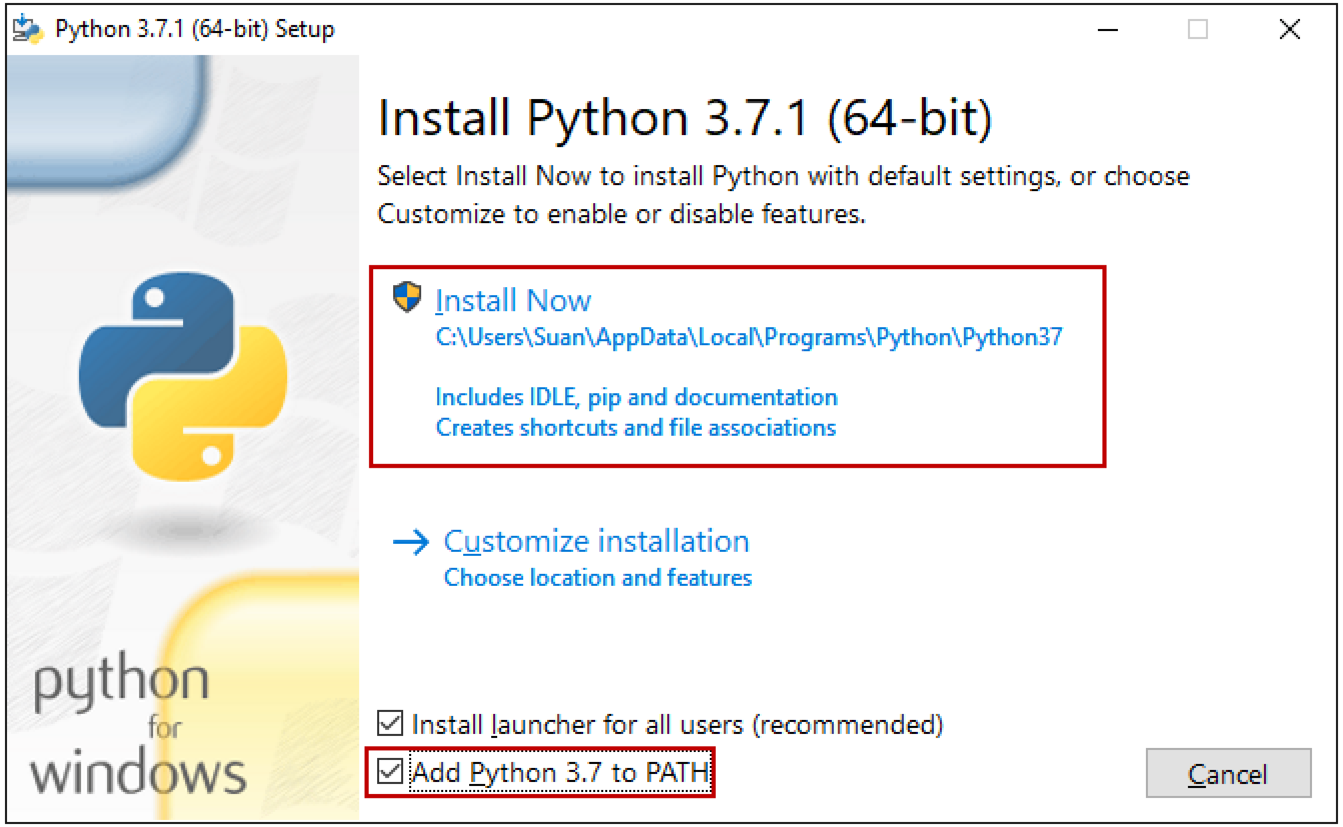
Note that Python 3.5+ *cannot* be used on Windows XP or earlier.

Not the OS you are looking for? Python can be used on many operating systems and environments.

View the full list of downloads.

Python is a programming language that lets you work quickly and integrate systems more effectively. >>> Learn More

Python 설치



Python 3.7.1 (64-bit) Setup

Install Python 3.7.1 (64-bit)

Select Install Now to install Python with default settings, or choose Customize to enable or disable features.

Install Now
C:\Users\Suan\AppData\Local\Programs\Python\Python37

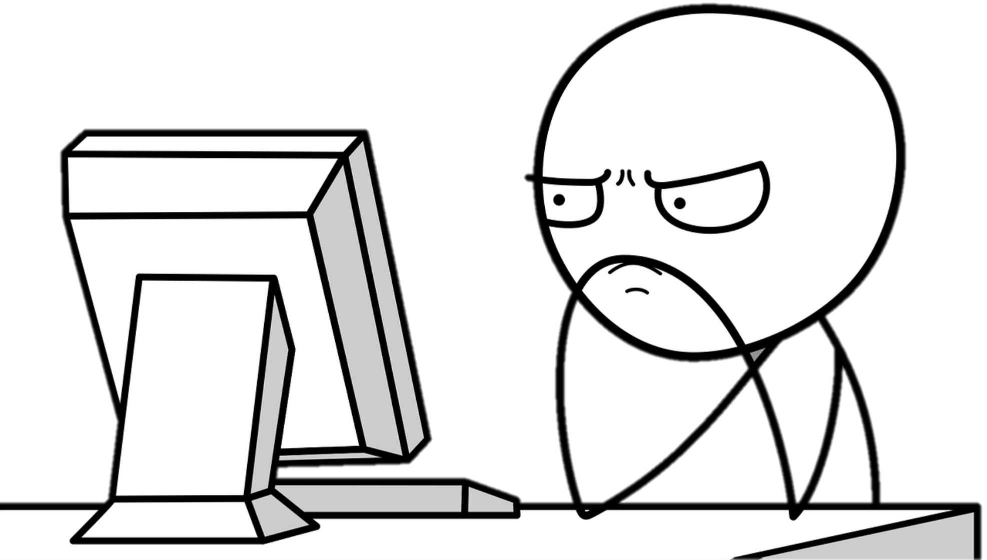
Includes IDLE, pip and documentation
Creates shortcuts and file associations

→ Customize installation
Choose location and features

☑ Install launcher for all users (recommended)

☑ Add Python 3.7 to PATH

3. pygame 설치



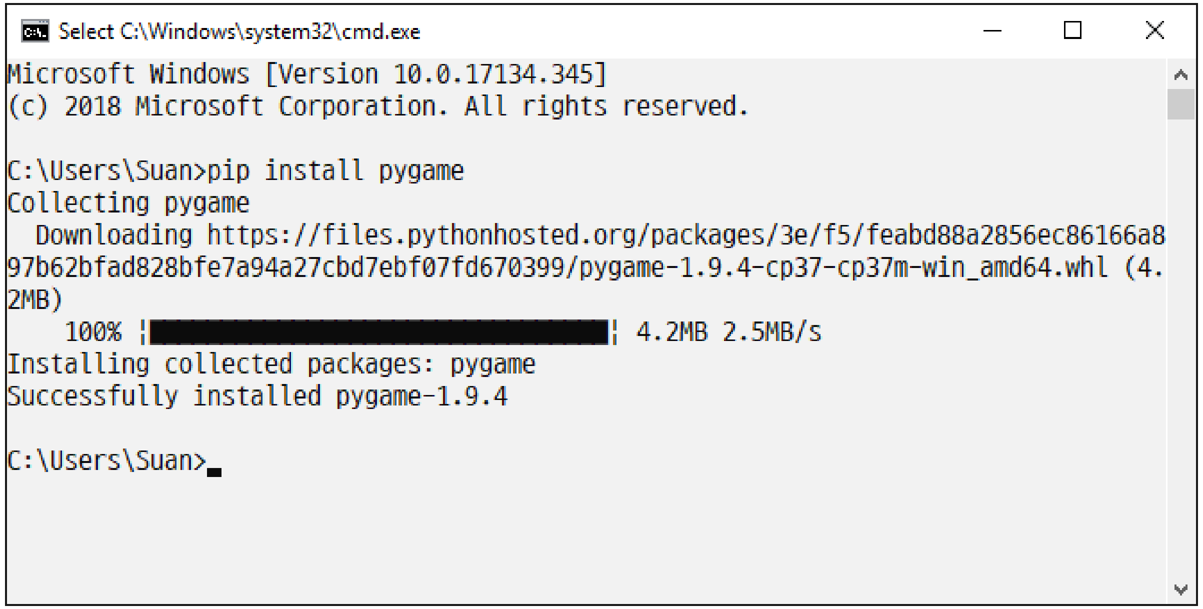
pygame

- pygame은 SDL라이브러리 위에 구축되어 게임과 같은 멀티미디어 어플리케이션을 만들기 위한 오픈 소스 파이썬 프로그래밍 라이브러리

- Silliness built in.
- Does not require OpenGL.
- Multi core CPUs can be used easily.
- Uses optimized C, and Assembly code for core functions.
- Comes with many Operating systems.
- Truly portable.
- It's Simple and easy to use.
- Does not require a GUI to use all functions.
- Small amount of code.
- It's not the best game library.

파이썬에 pygame 라이브러리 추가

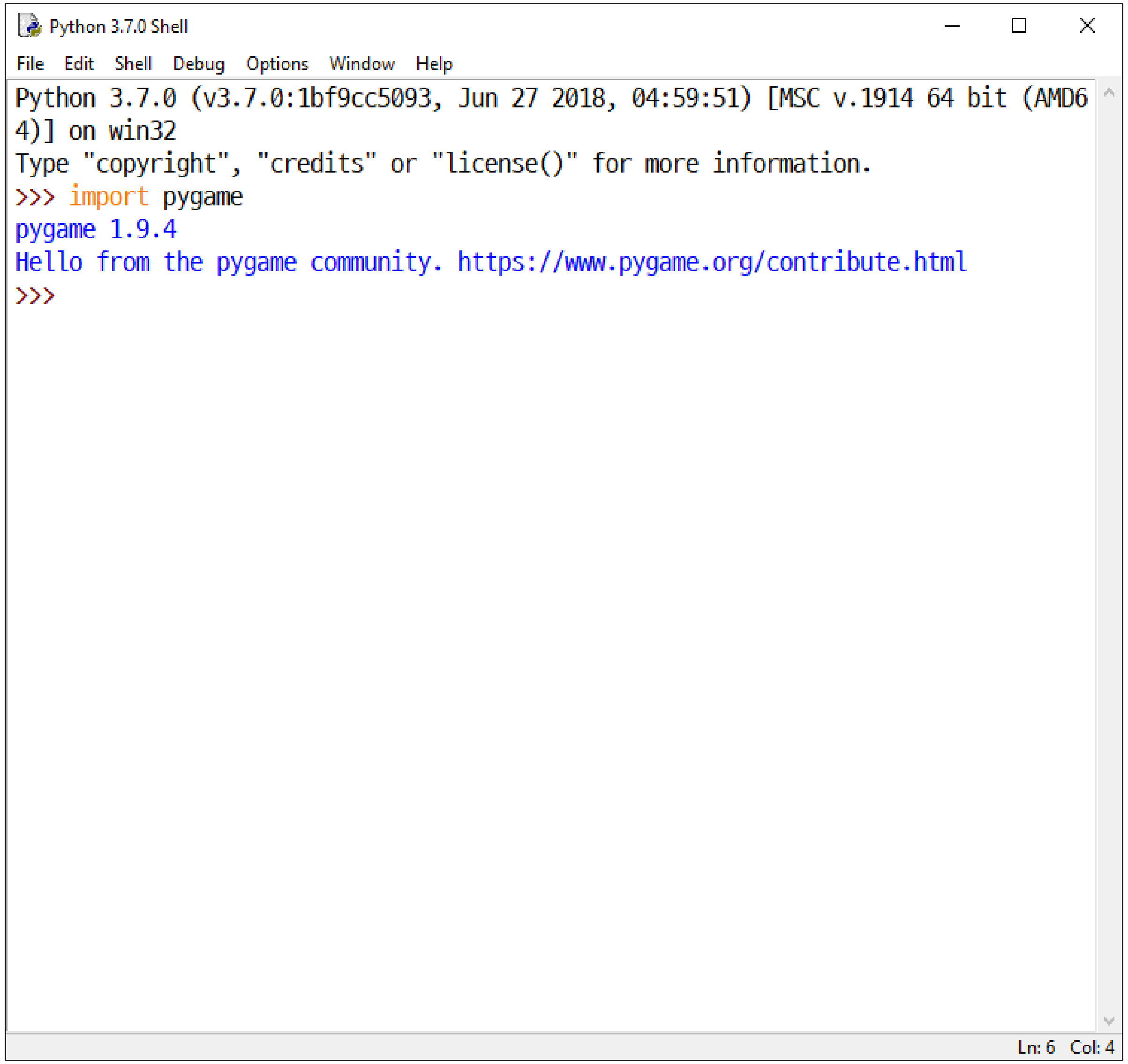
- Command Prompt 열기
  - [시작] – [실행] – cmd.exe
- pygame 라이브러리 추가 명령어
  - pip install pygame



```
Microsoft Windows [Version 10.0.17134.345]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Suan>pip install pygame
Collecting pygame
  Downloading https://files.pythonhosted.org/packages/3e/f5/feabd88a2856ec86166a8
97b62bfad828bfe7a94a27cbd7ebf07fd670399/pygame-1.9.4-cp37-cp37m-win_amd64.whl (4.
2MB)
    100% |████████████████████████████████| 4.2MB 2.5MB/s
Installing collected packages: pygame
Successfully installed pygame-1.9.4

C:\Users\Suan>
```

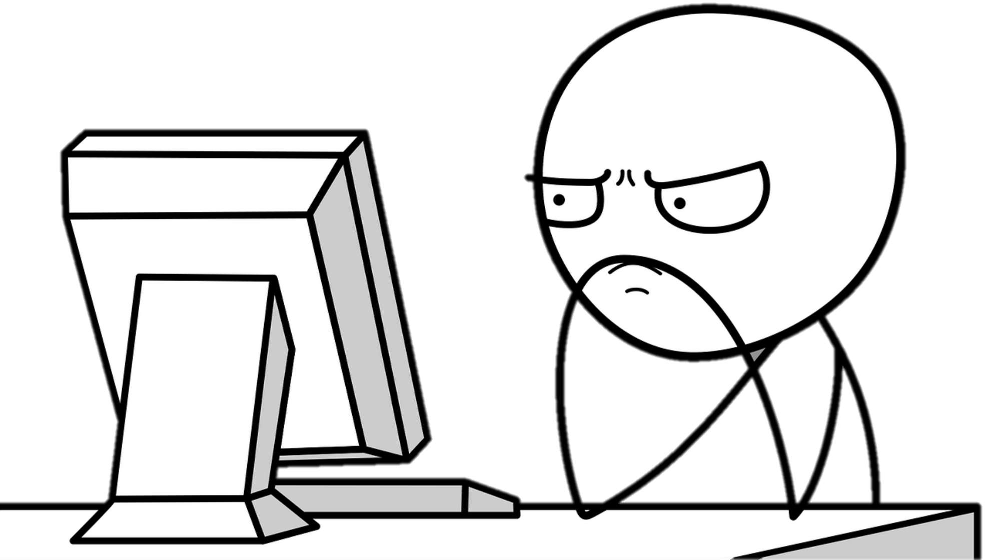
파이썬에서 pygame 설치 확인

- Python Shell에서 명령어를 통해 pygame 설치 확인
  - import pygame

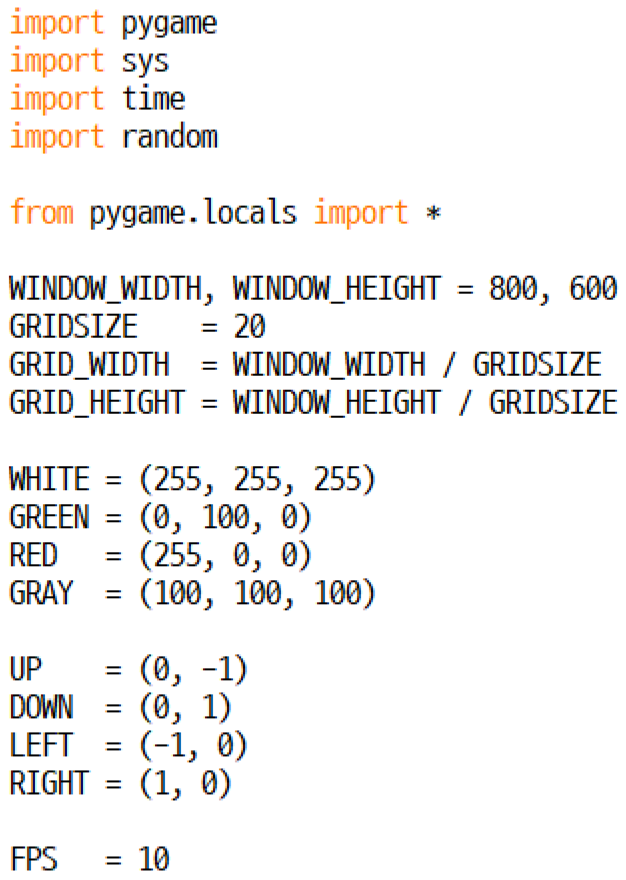


```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD6
4)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> import pygame
pygame 1.9.4
Hello from the pygame community. https://www.pygame.org/contribute.html
>>>
```

4. 파이썬 게임 만들기

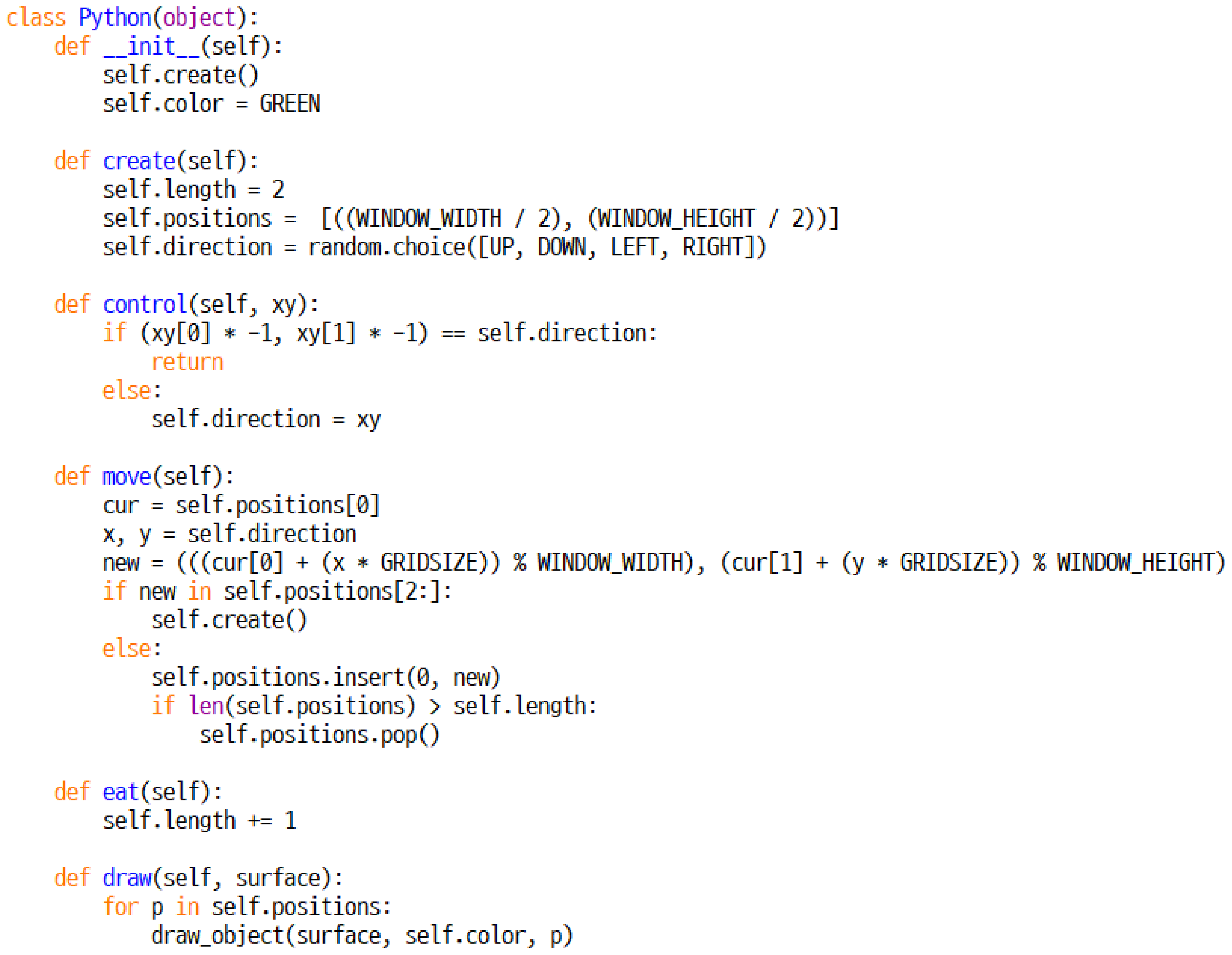


Import & global variable



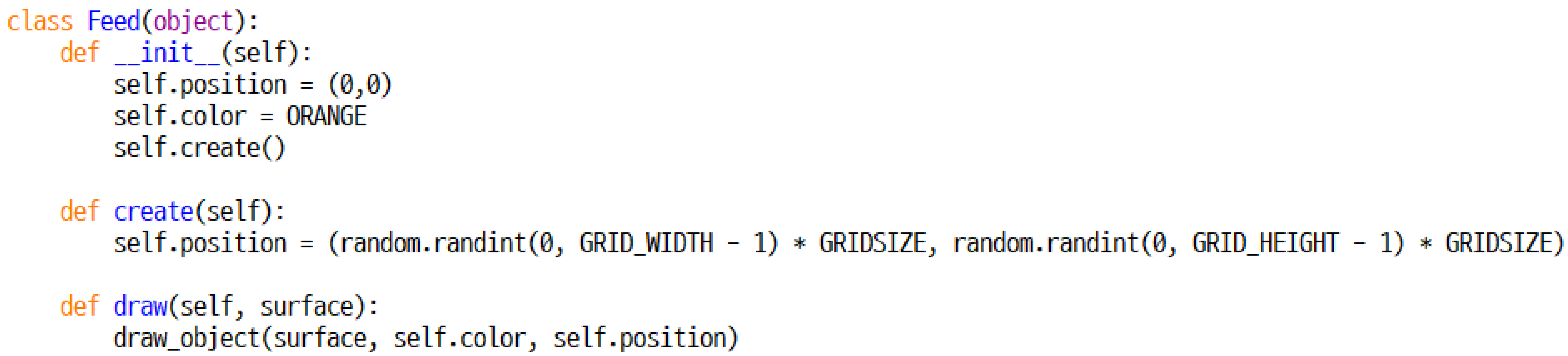
```python
import pygame
import sys
import time
import random

from pygame.locals import *

WINDOW_WIDTH, WINDOW_HEIGHT = 800, 600
GRIDSIZE    = 20
GRID_WIDTH  = WINDOW_WIDTH / GRIDSIZE
GRID_HEIGHT = WINDOW_HEIGHT / GRIDSIZE

WHITE = (255, 255, 255)
GREEN = (0, 100, 0)
RED   = (255, 0, 0)
GRAY  = (100, 100, 100)

UP    = (0, -1)
DOWN  = (0, 1)
LEFT  = (-1, 0)
RIGHT = (1, 0)

FPS   = 10
```

Class Python



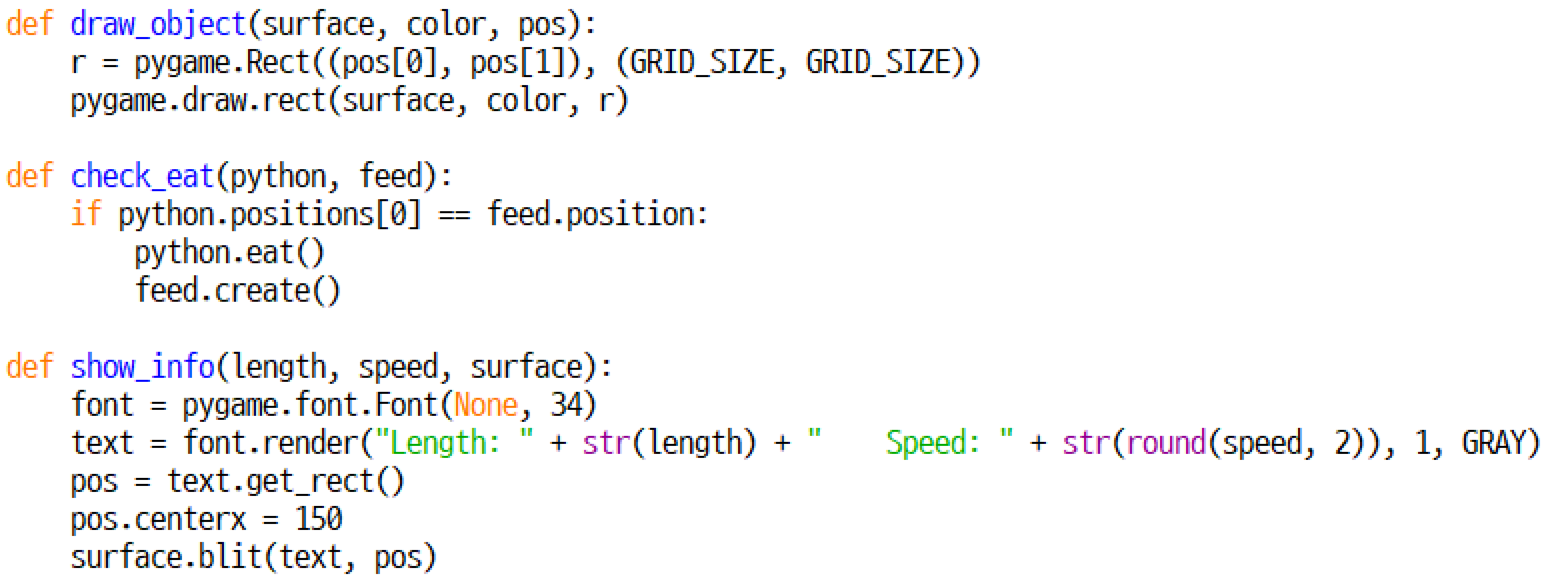
```python
class Python(object):
    def __init__(self):
        self.create()
        self.color = GREEN

    def create(self):
        self.length = 2
        self.positions =  [((WINDOW_WIDTH / 2), (WINDOW_HEIGHT / 2))]
        self.direction = random.choice([UP, DOWN, LEFT, RIGHT])

    def control(self, xy):
        if (xy[0] * -1, xy[1] * -1) == self.direction:
            return
        else:
            self.direction = xy

    def move(self):
        cur = self.positions[0]
        x, y = self.direction
        new = (((cur[0] + (x * GRIDSIZE)) % WINDOW_WIDTH), (cur[1] + (y * GRIDSIZE)) % WINDOW_HEIGHT)
        if new in self.positions[2:]:
            self.create()
        else:
            self.positions.insert(0, new)
            if len(self.positions) > self.length:
                self.positions.pop()

    def eat(self):
        self.length += 1

    def draw(self, surface):
        for p in self.positions:
            draw_object(surface, self.color, p)
```

Class Feed



```python
class Feed(object):
    def __init__(self):
        self.position = (0,0)
        self.color = ORANGE
        self.create()

    def create(self):
        self.position = (random.randint(0, GRID_WIDTH - 1) * GRIDSIZE, random.randint(0, GRID_HEIGHT - 1) * GRIDSIZE)

    def draw(self, surface):
        draw_object(surface, self.color, self.position)
```

Functions



```python
def draw_object(surface, color, pos):
    r = pygame.Rect((pos[0], pos[1]), (GRID_SIZE, GRID_SIZE))
    pygame.draw.rect(surface, color, r)

def check_eat(python, feed):
    if python.positions[0] == feed.position:
        python.eat()
        feed.create()

def show_info(length, speed, surface):
    font = pygame.font.Font(None, 34)
    text = font.render("Length: " + str(length) + "    Speed: " + str(round(speed, 2)), 1, GRAY)
    pos = text.get_rect()
    pos.centerx = 150
    surface.blit(text, pos)
```

__main__

```
if __name__ == '__main__':
    python = Python()
    feed = Feed()

    pygame.init()
    window = pygame.display.set_mode((WINDOW_WIDTH, WINDOW_HEIGHT), 0, 32)
    pygame.display.set_caption('Python Game')
    surface = pygame.Surface(window.get_size())
    surface = surface.convert()
    surface.fill(WHITE)
    clock = pygame.time.Clock()
    pygame.key.set_repeat(1, 40)
    window.blit(surface, (0,0))
```

```
while True:

    for event in pygame.event.get():
        if event.type == QUIT:
            pygame.quit()
            sys.exit()
        elif event.type == KEYDOWN:
            if event.key == K_UP:
                python.control(UP)
            elif event.key == K_DOWN:
                python.control(DOWN)
            elif event.key == K_LEFT:
                python.control(LEFT)
            elif event.key == K_RIGHT:
                python.control(RIGHT)

    surface.fill(WHITE)
    python.move()
    check_eat(python, feed)
    speed = (FPS + python.length)/2
    show_info(python.length, speed, surface)
    python.draw(surface)
    feed.draw(surface)
    window.blit(surface, (0,0))
    pygame.display.flip()
    pygame.display.update()
    clock.tick(speed)
```

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