



이수안 컴퓨터 연구소

suan computer laboratory

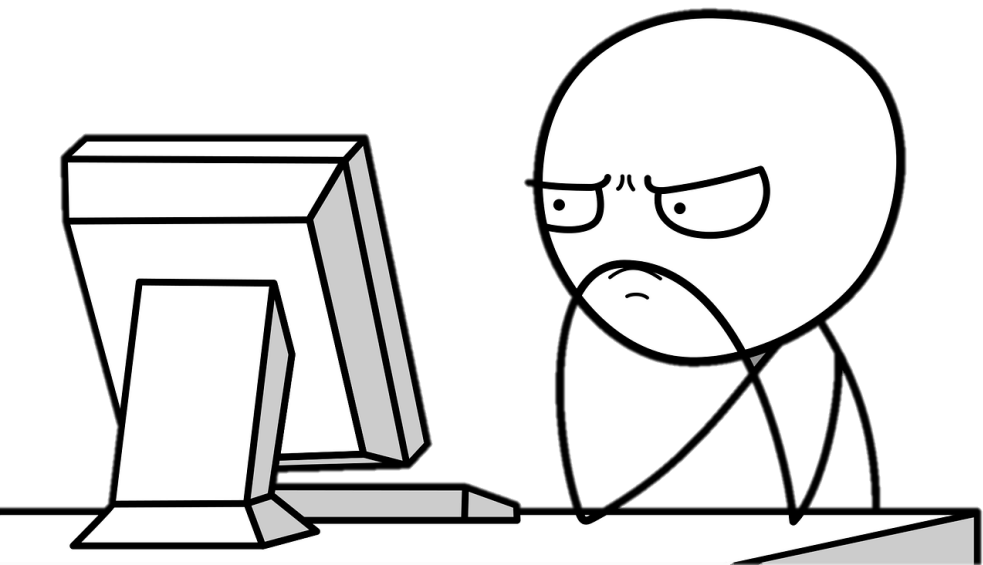
파이썬 레이싱 카 게임 만들기



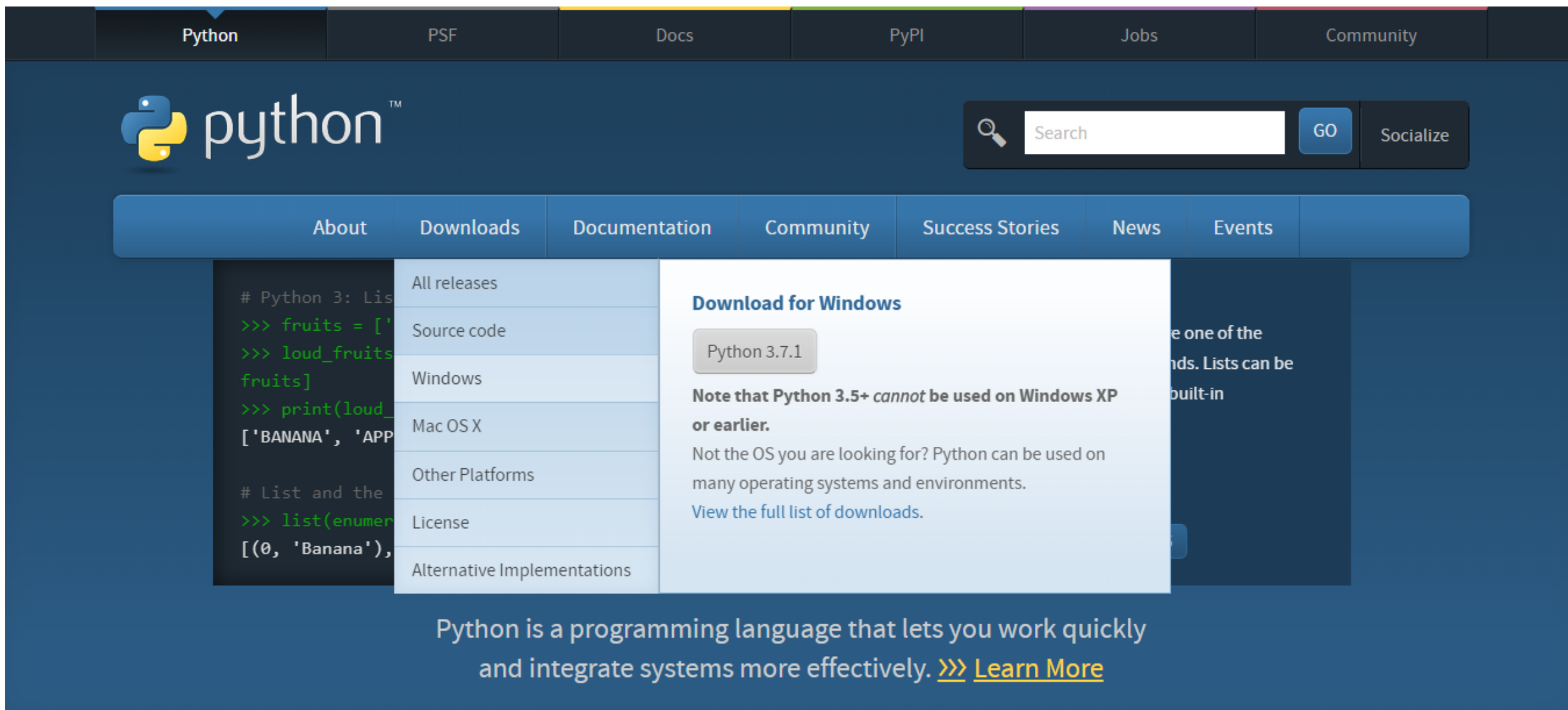
목차

1. 파이썬 설치
2. pygame 설치
3. 파이썬 레이싱 카 게임 만들기

2. 파이썬 설치



Python 다운로드



The screenshot shows the Python.org homepage. The top navigation bar includes links for Python, PSF, Docs, PyPI, Jobs, and Community. The main header features the Python logo and a search bar. Below the header is a secondary navigation bar with links for About, Downloads, Documentation, Community, Success Stories, News, and Events. The Downloads menu is open, showing a list of options: All releases, Source code, Windows, Mac OS X, Other Platforms, License, and Alternative Implementations. A modal window titled "Download for Windows" is displayed, showing the current version as Python 3.7.1. It includes a note that Python 3.5+ cannot be used on Windows XP or earlier, and a link to view the full list of downloads. At the bottom of the page, a message states: "Python is a programming language that lets you work quickly and integrate systems more effectively. >>> [Learn More](#)".

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Download for Windows

Python 3.7.1

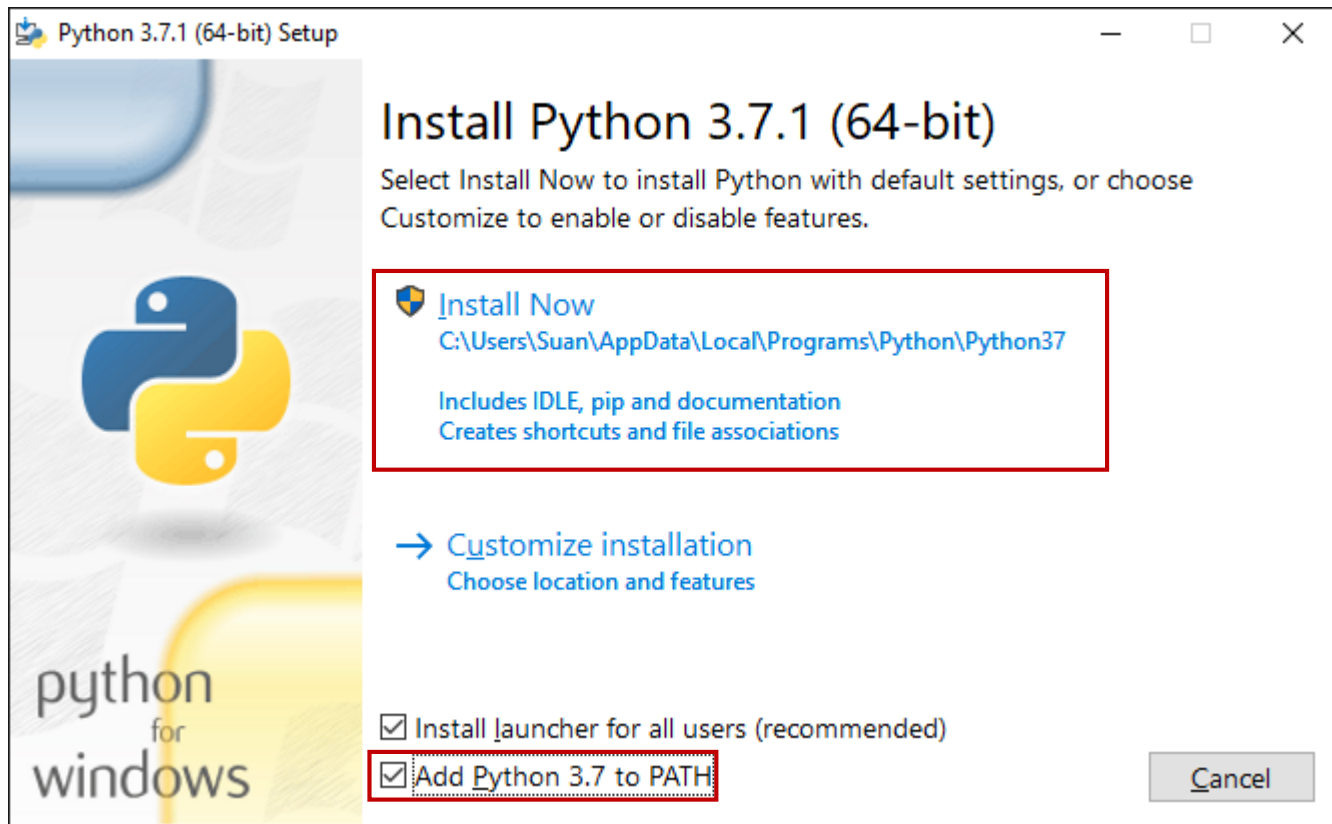
Note that Python 3.5+ cannot be used on Windows XP or earlier.

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

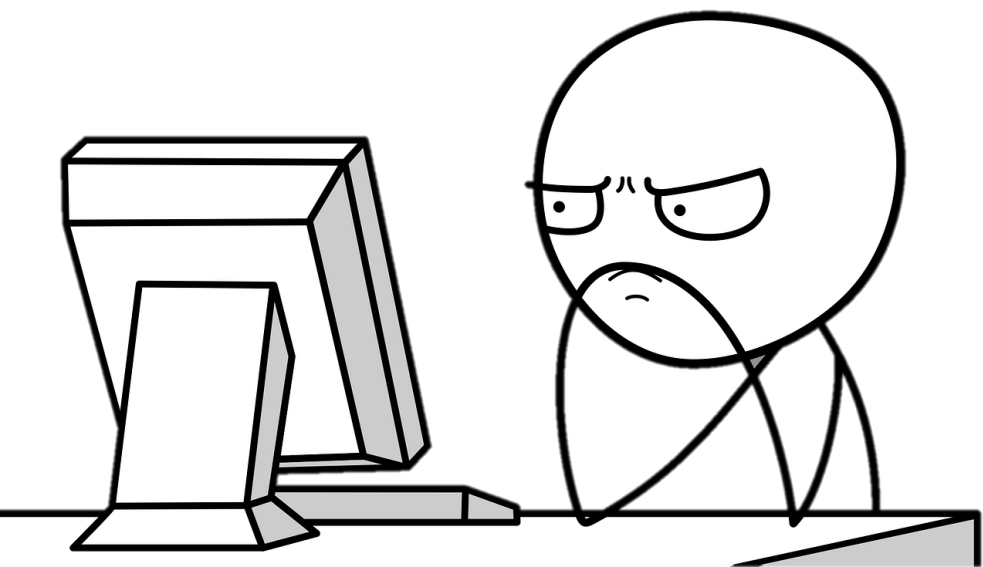
[View the full list of downloads.](#)

Python is a programming language that lets you work quickly and integrate systems more effectively. >>> [Learn More](#)

Python 설치



2. pygame 설치



pygame

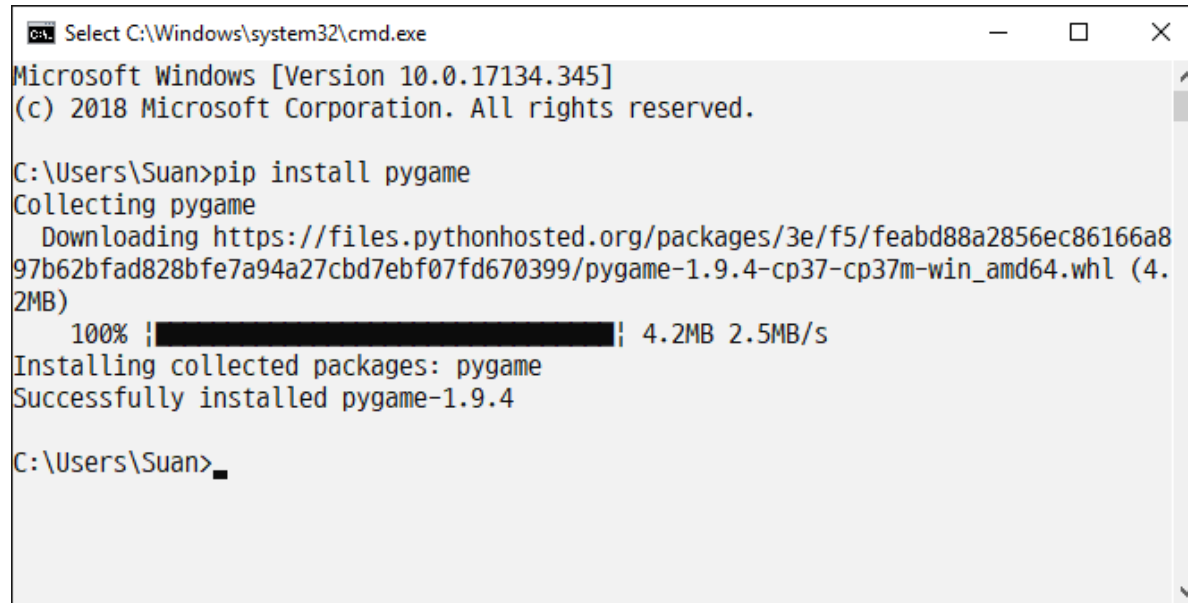
- pygame은 SDL라이브러리 위에 구축되어 게임과 같은 멀티미디어 어플리케이션을 만들기 위한 오픈 소스 파이썬 프로그래밍 라이브러리



- 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



```

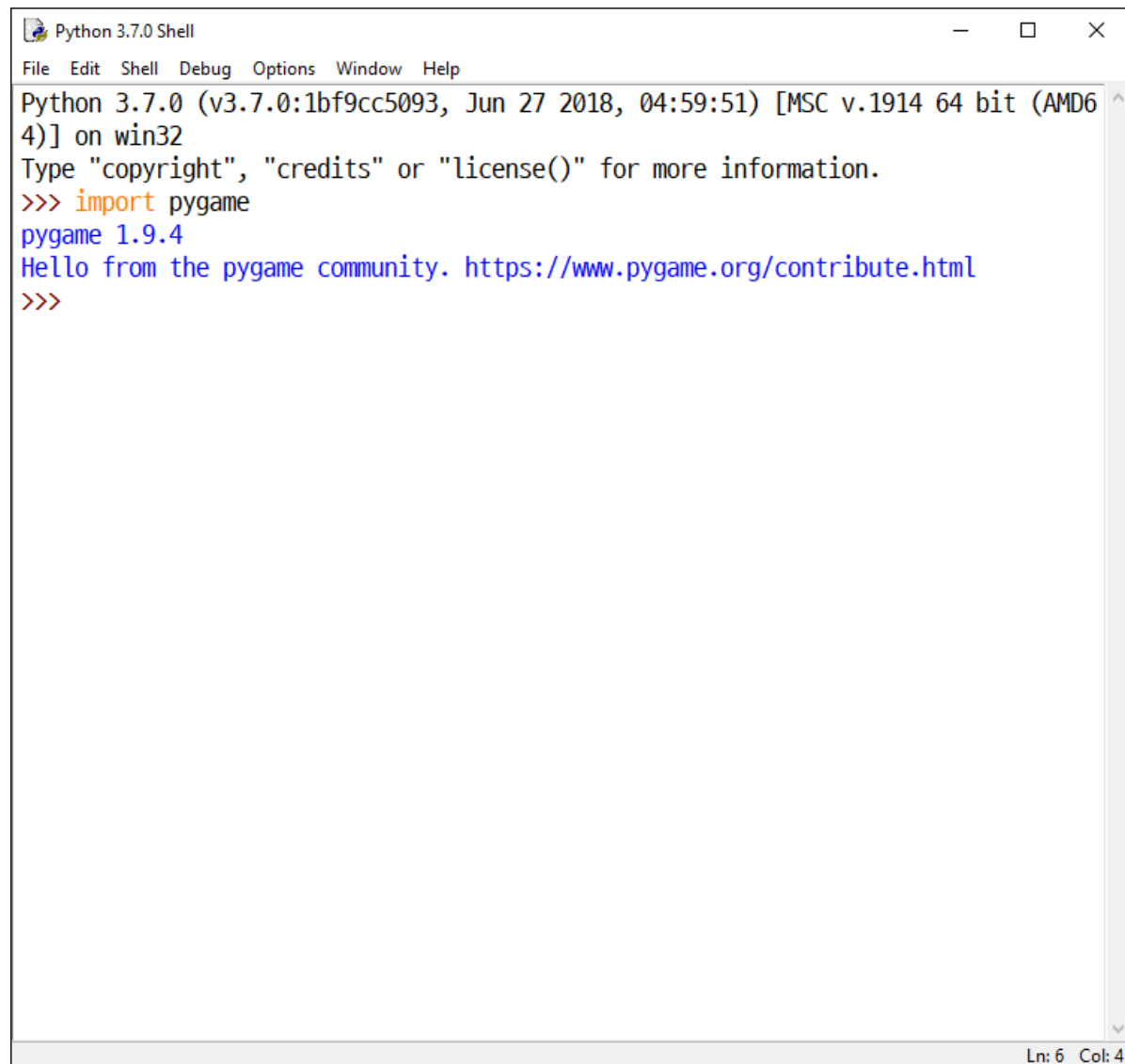
Select C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.17134.345]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Suan>pip install pygame
Collecting pygame
  Downloading https://files.pythonhosted.org/packages/3e/f5/feabd88a2856ec86166a897b62bfad828bfe7a94a27cbd7ebf07fd670399/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>
```

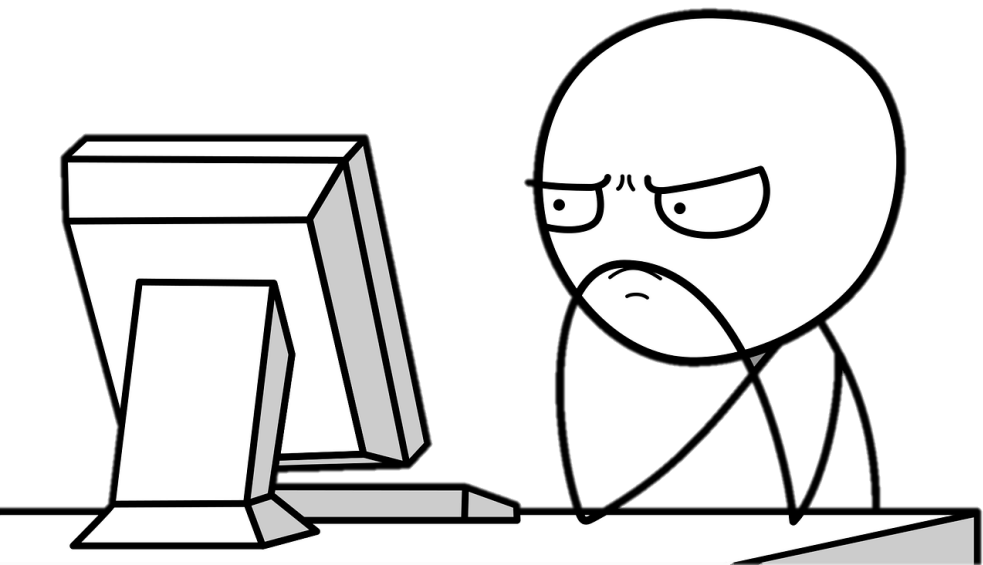
파이썬에서 pygame 설치 확인

- Python Shell에서 명령어를 통해 pygame 설치 확인
 - `import pygame`

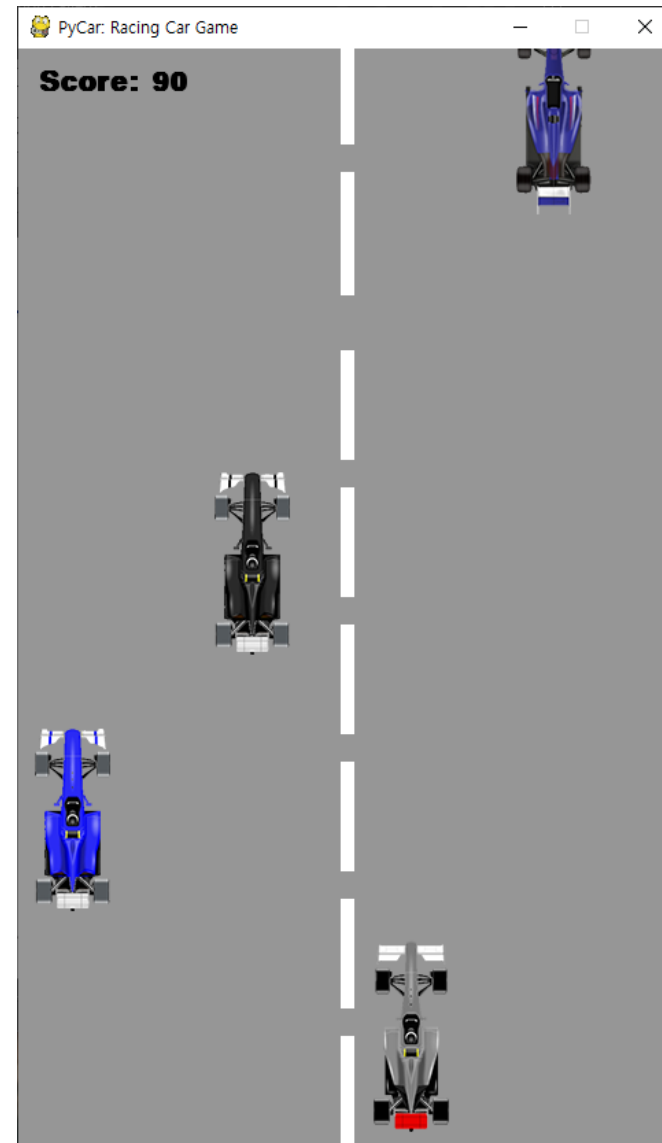


```
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> import pygame
pygame 1.9.4
Hello from the pygame community. https://www.pygame.org/contribute.html
>>>
```

3. 파이썬 레이싱 카 게임 만들기



PyCar: Racing Car Game





Import & global variable

```
import pygame
import random
from time import sleep
```

```
WINDOW_WIDTH = 480
WINDOW_HEIGHT = 800
```

```
BLACK = (0, 0, 0)
WHITE = (255, 255, 255)
GRAY = (150, 150, 150)
RED = (255, 0, 0)
```

Class Car

```
class Car:

    image_car = ['RacingCar01.png', 'RacingCar02.png', 'RacingCar03.png', 'RacingCar04.png', 'RacingCar05.png', \
                  'RacingCar06.png', 'RacingCar07.png', 'RacingCar08.png', 'RacingCar09.png', 'RacingCar10.png', \
                  'RacingCar11.png', 'RacingCar12.png', 'RacingCar13.png', 'RacingCar14.png', 'RacingCar15.png', \
                  'RacingCar16.png', 'RacingCar17.png', 'RacingCar18.png', 'RacingCar19.png', 'RacingCar20.png', ]

    def __init__(self, x=0, y=0, dx=0, dy=0):
        self.image = ""
        self.x = x
        self.y = y
        self.dx = dx
        self.dy = dy

    def load_image(self):
        self.image = pygame.image.load(random.choice(self.image_car))
        self.width = self.image.get_rect().size[0]
        self.height = self.image.get_rect().size[1]

    def draw_image(self):
        screen.blit(self.image, [self.x, self.y])

    def move_x(self):
        self.x += self.dx

    def move_y(self):
        self.y += self.dy

    def check_out_of_screen(self):
        if self.x+self.width > WINDOW_WIDTH or self.x < 0:
            self.x -= self.dx

    def check_crash(self, car):
        if (self.x+self.width > car.x) and (self.x < car.x+car.width) and (self.y < car.y+car.height) and (self.y+self.height > car.y):
            return True
        else:
            return False
```

Functions

```
def draw_main_menu():
    draw_x = (WINDOW_WIDTH / 2) - 200
    draw_y = WINDOW_HEIGHT / 2
    image_intro = pygame.image.load('PyCar.png')
    screen.blit(image_intro, [draw_x, draw_y - 280])
    font_40 = pygame.font.SysFont("FixedSys", 40, True, False)
    font_30 = pygame.font.SysFont("FixedSys", 30, True, False)
    text_title = font_40.render("PyCar: Racing Car Game", True, BLACK)
    screen.blit(text_title, [draw_x, draw_y])
    score_text = font_40.render("Score: " + str(score), True, WHITE)
    screen.blit(score_text, [draw_x, draw_y + 70])
    text_start = font_30.render("Press Space Key to Start!", True, RED)
    screen.blit(text_start, [draw_x, draw_y + 140])
    pygame.display.flip()

def draw_score():
    font_30 = pygame.font.SysFont("FixedSys", 30, True, False)
    txt_score = font_30.render("Score: " + str(score), True, BLACK)
    screen.blit(txt_score, [15, 15])
```



```
if __name__ == '__main__':

    pygame.init()

    screen = pygame.display.set_mode((WINDOW_WIDTH, WINDOW_HEIGHT))
    pygame.display.set_caption("PyCar: Racing Car Game")
    clock = pygame.time.Clock()

    # 게임 사운드
    pygame.mixer.music.load('race.wav')
    sound_crash = pygame.mixer.Sound('crash.wav')
    sound_engine = pygame.mixer.Sound('engine.wav')

    # 사용자 레이싱 카 생성
    player = Car(WINDOW_WIDTH / 2, (WINDOW_HEIGHT - 150), 0, 0)
    player.load_image()

    # 컴퓨터 레이싱 카 생성
    cars = []
    car_count = 3
    for i in range(car_count):
        x = random.randrange(0, WINDOW_WIDTH-55)
        car = Car(x, random.randrange(-150, -50), 0, random.randint(5, 10))
        car.load_image()
        cars.append(car)

    # 도로 차선 생성
    lanes = []
    lane_width = 10
    lane_height = 80
    lane_margin = 20
    lane_count = 10
    lane_x = (WINDOW_WIDTH - lane_width) / 2
    lane_y = -10
    for i in range(lane_count):
        lanes.append([lane_x, lane_y])
        lane_y += lane_height + lane_margin
```

main

```
score = 0
crash = True
game_on = True
while game_on:
    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            game_on = False

    # 게임 다시 시작
    if crash:
        if event.type == pygame.KEYDOWN and event.key == pygame.K_SPACE:
            crash = False
            for i in range(car_count):
                cars[i].x = random.randrange(0, WINDOW_WIDTH-cars[i].width)
                cars[i].y = random.randrange(-150, -50)
                cars[i].load_image()

            player.load_image()
            player.x = 175
            player.dx = 0
            score = 0
            pygame.mouse.set_visible(False)
            sound_engine.play()
            sleep(5)
            pygame.mixer.music.play(-1)

    if not crash:
        if event.type == pygame.KEYDOWN:
            if event.key == pygame.K_RIGHT:
                player.dx = 4
            elif event.key == pygame.K_LEFT:
                player.dx = -4

        if event.type == pygame.KEYUP:
            if event.key == pygame.K_LEFT:
                player.dx = 0
            elif event.key == pygame.K_RIGHT:
                player.dx = 0

    # GRAY로 화면 채우기
    screen.fill(GRAY)
```

```
# 게임 화면 출력
if not crash:
    # 도로 차선 이동
    for i in range(lane_count):
        pygame.draw.rect(screen, WHITE, [lanes[i][0], lanes[i][1], lane_width, lane_height])
        lanes[i][1] += 10 # 도로 차선 속도
        if lanes[i][1] > WINDOW_HEIGHT:
            lanes[i][1] = -40 - lane_height

    # 사용자 레이싱 카
    player.draw_image()
    player.move_x()
    player.check_out_of_screen()

    # 컴퓨터 레이싱 카
    for i in range(car_count):
        cars[i].draw_image()
        cars[i].y += cars[i].dy
        if cars[i].y > WINDOW_HEIGHT:
            score += 10
            cars[i].y = random.randrange(-150, -50)
            cars[i].x = random.randrange(0, WINDOW_WIDTH-cars[i].width)
            cars[i].dy = random.randint(4, 9)
            cars[i].load_image()

    # 레이싱 카 충돌사고 체크
    for i in range(car_count):
        if player.check_crash(cars[i]):
            crash = True
            pygame.mixer.music.stop()
            sound_crash.play()
            sleep(2)
            pygame.mouse.set_visible(True)
            break

    draw_score()
    pygame.display.flip()
else:
    draw_main_menu()

clock.tick(60)

pygame.quit()
```

