Lecture #4. 애니메이션

2D 게임 프로그래밍

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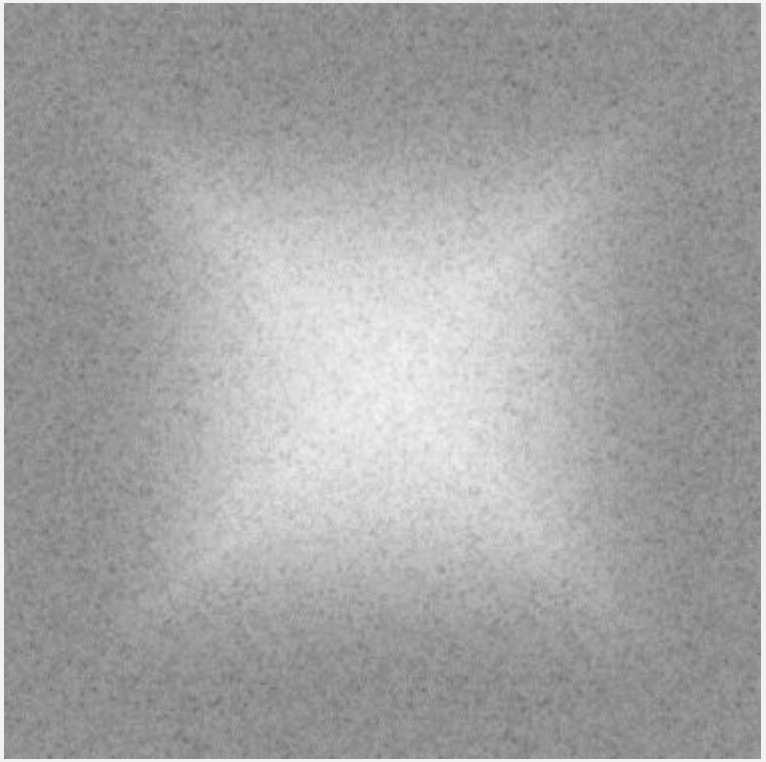
학습 내용

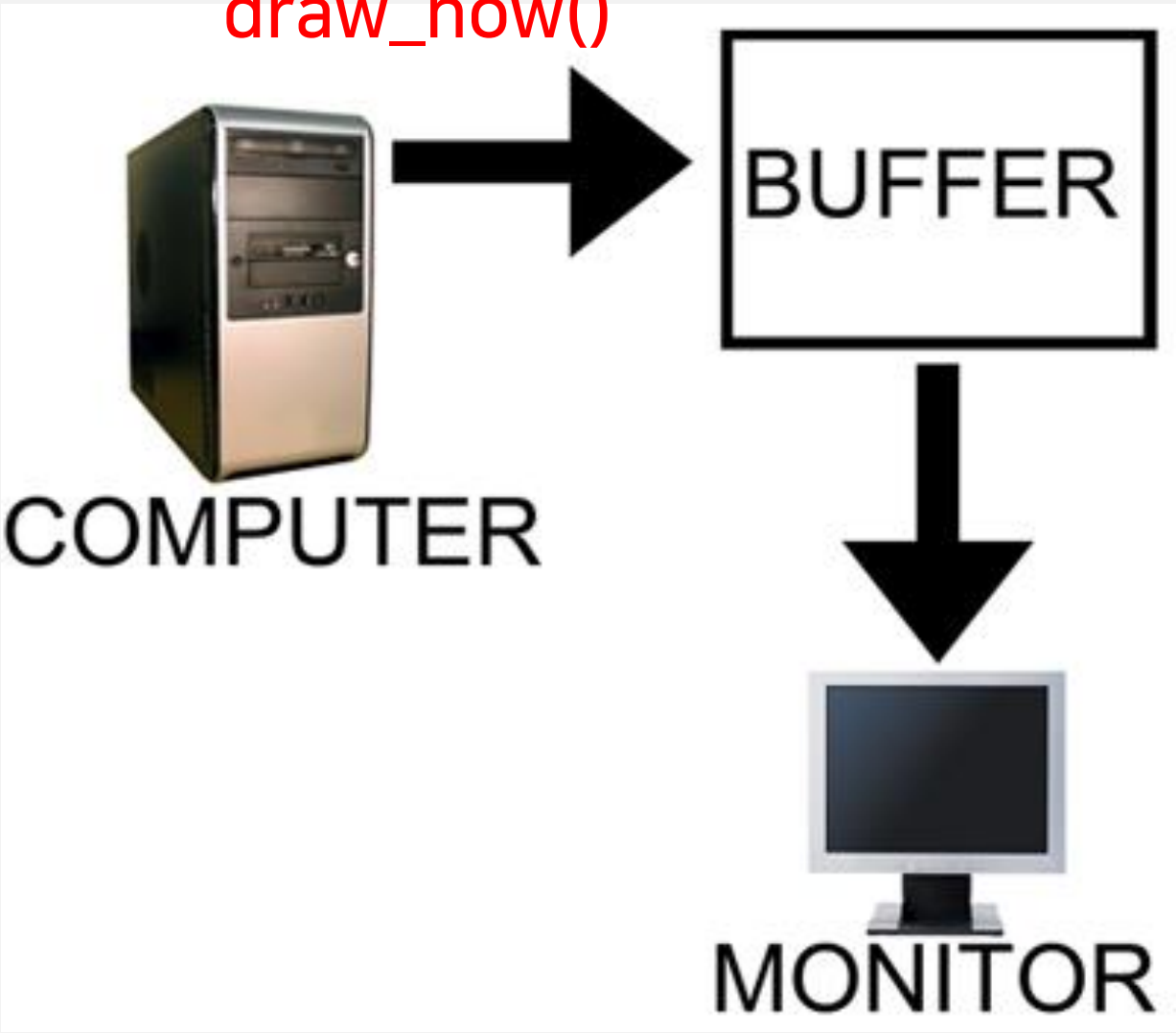
- 더블 버퍼링
- 플리핑
- 스프라이트 애니메이션

지난 번 실습의 문제점? – 화면 플리커링

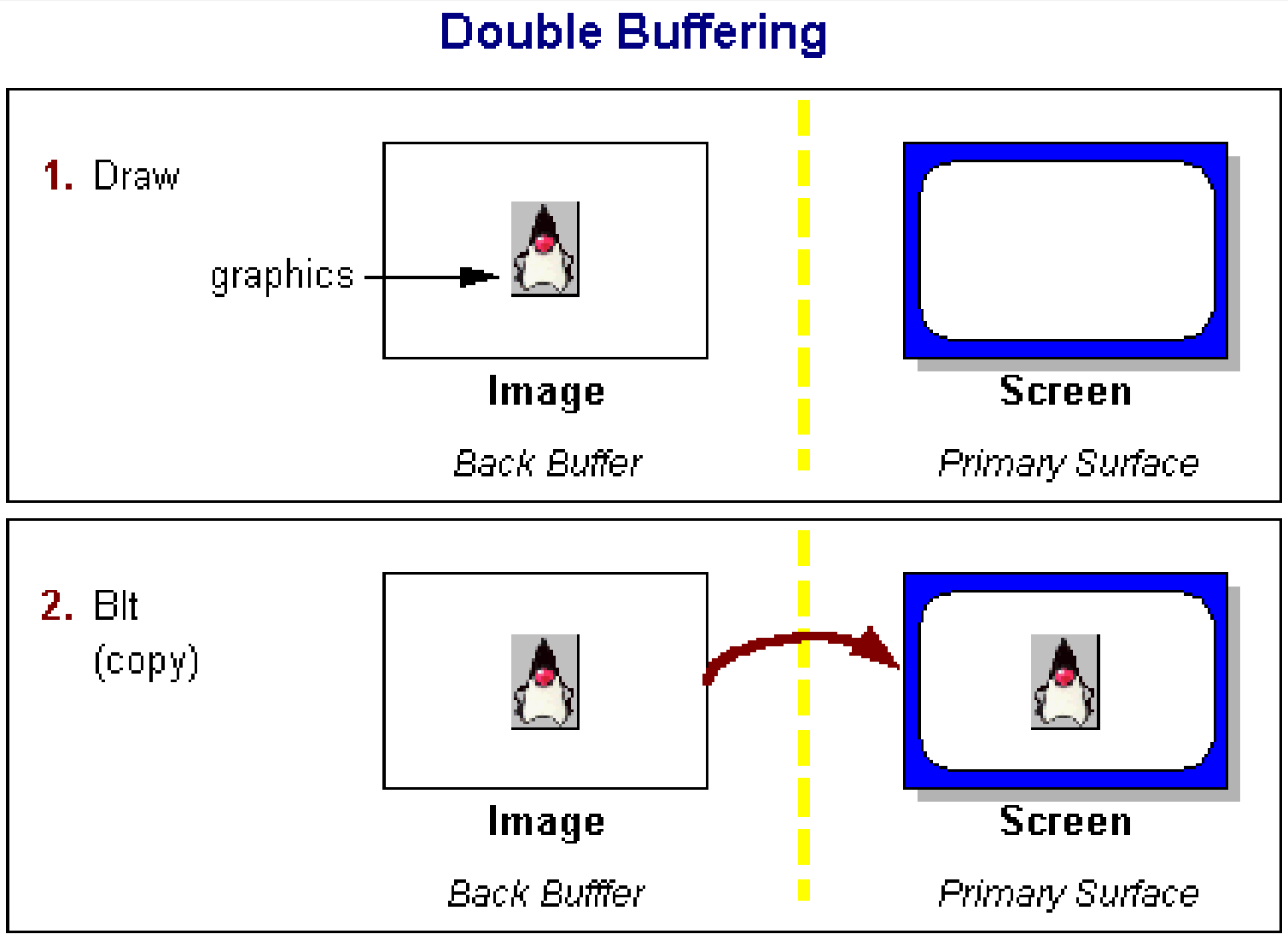


무대의 커튼은 왜 있을까?

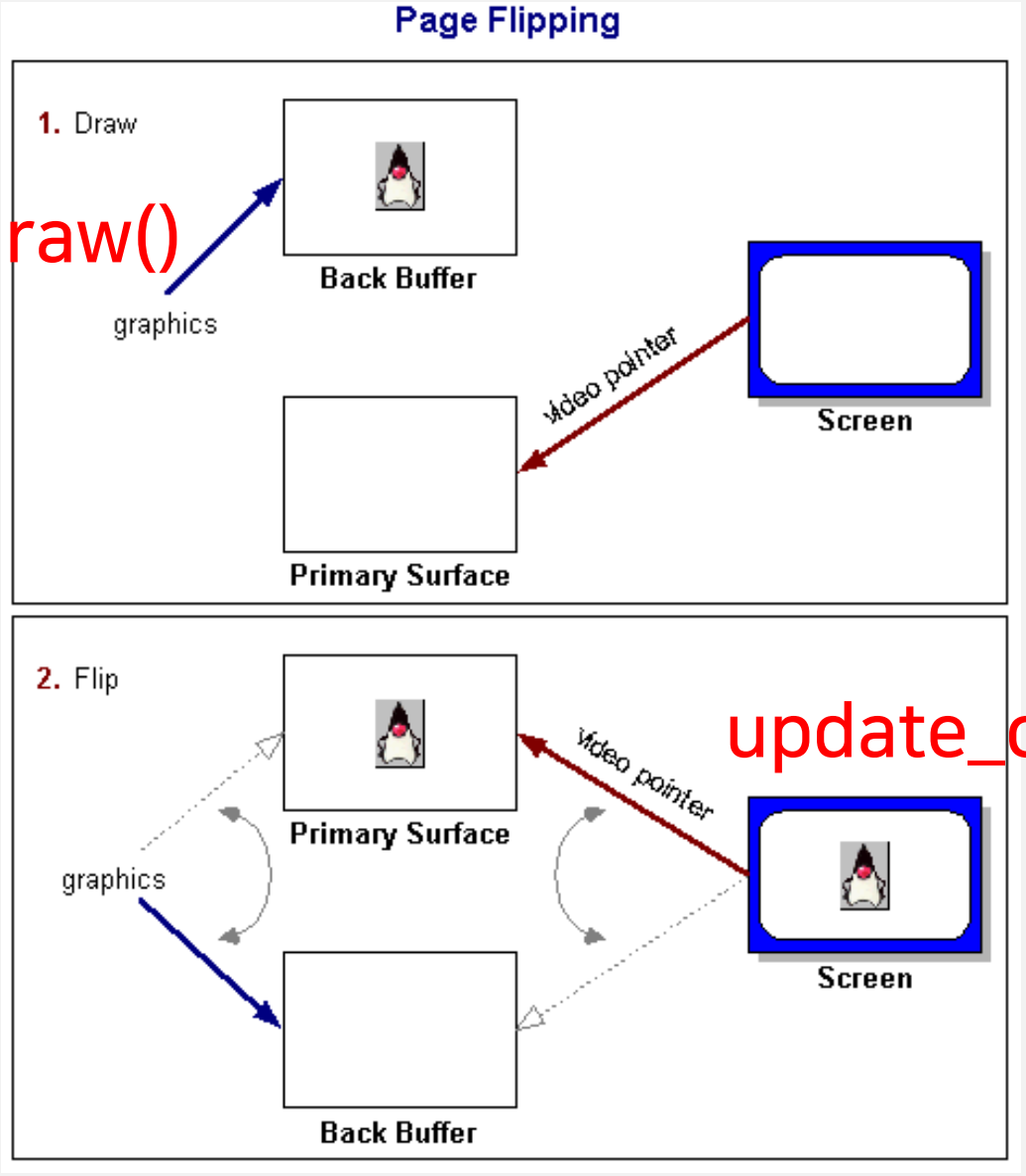
프레임 버퍼(Frame Buffer)



더블 버퍼링(Double Buffering)



페이지 플리핑(Page Flipping)



update_canvas()

후면 버퍼(Back Buffer)에 그리기

```
>>> from pico2d import *
>>> open_canvas()
>>> character = load_image('character.png')
>>> character.draw(100,100)
>>> character.draw(200,200)
```

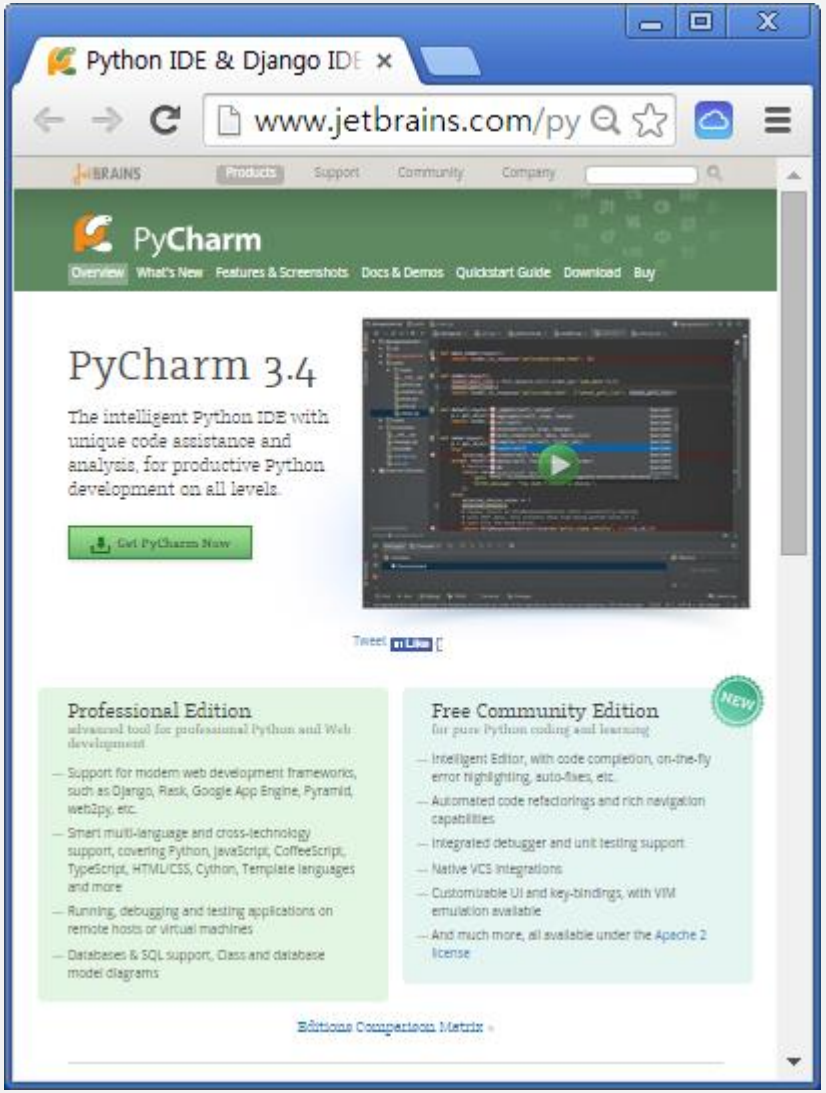
페이지 플리핑

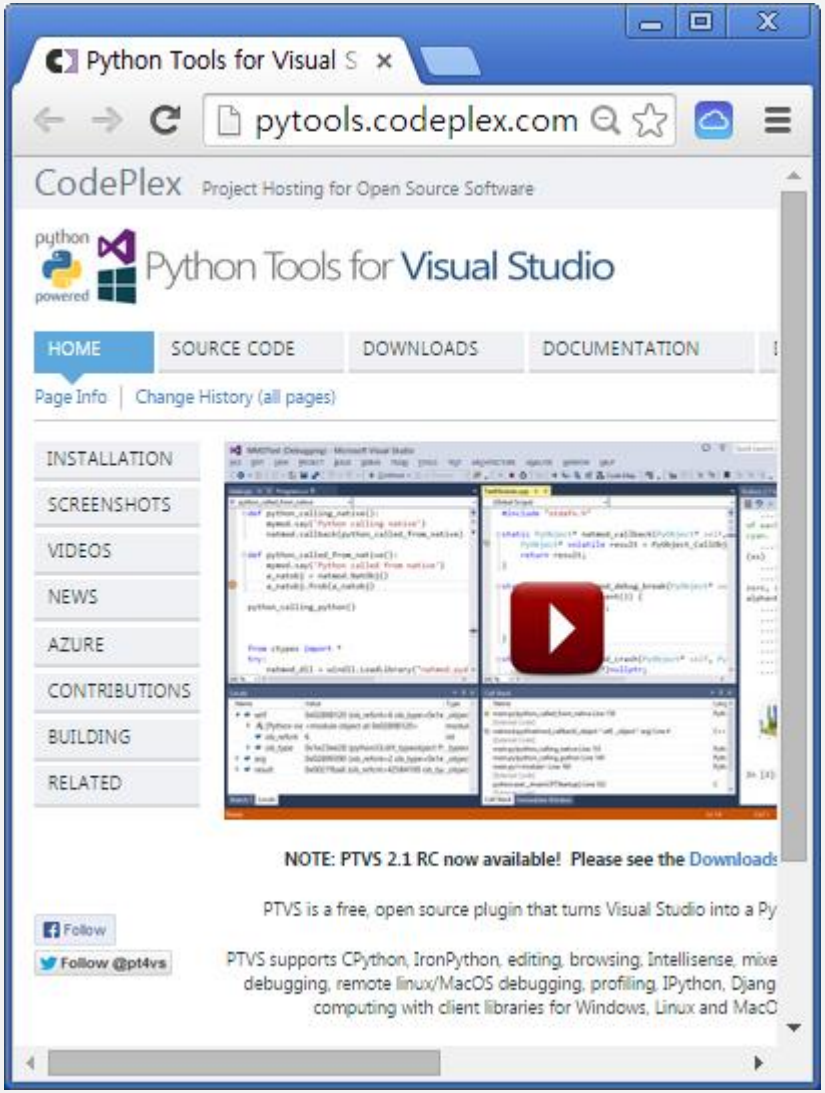
```
>>> update_canvas()
```

화면 지우기

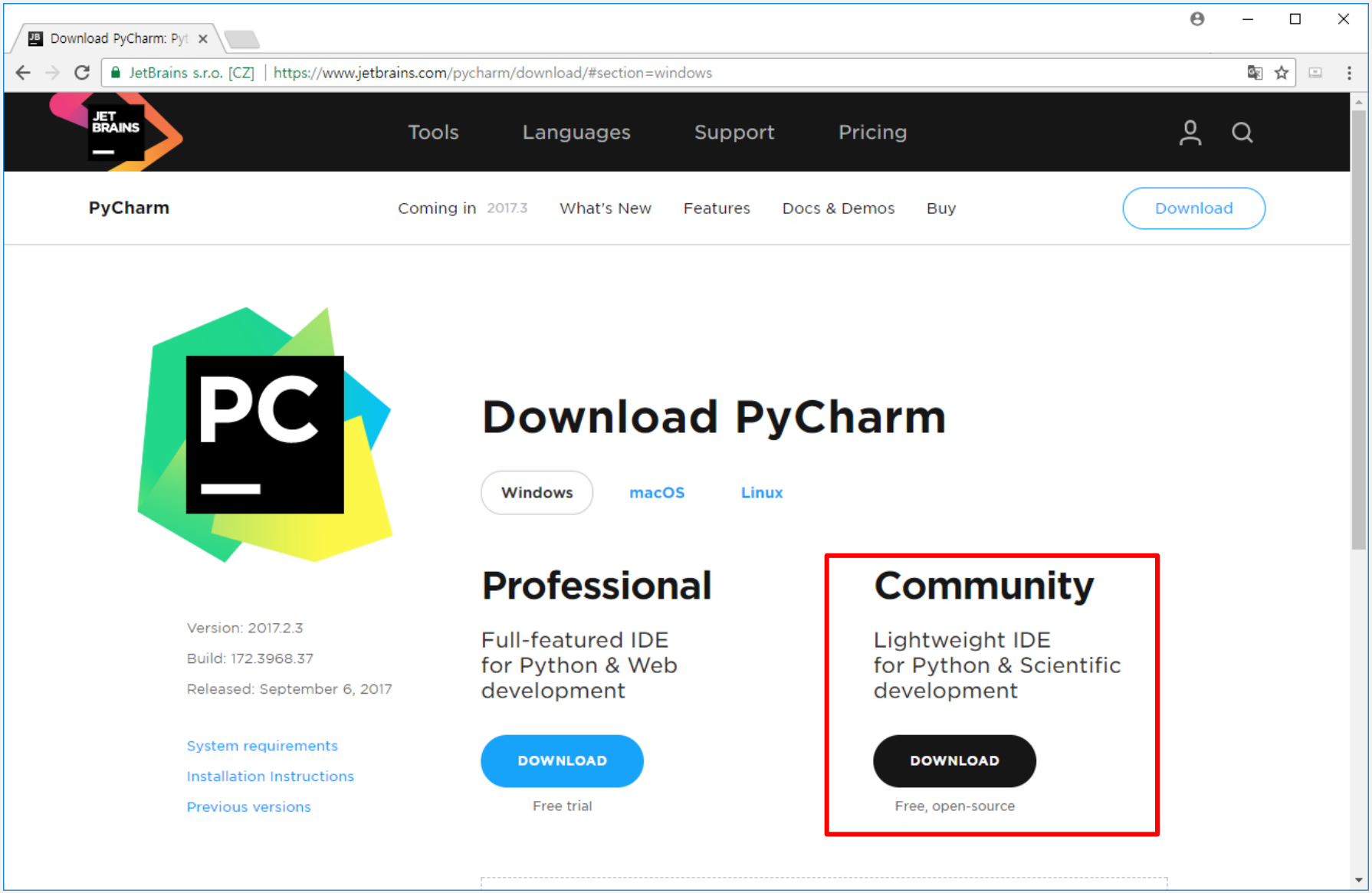
```
>>> clear_canvas()
>>> update_canvas()
```

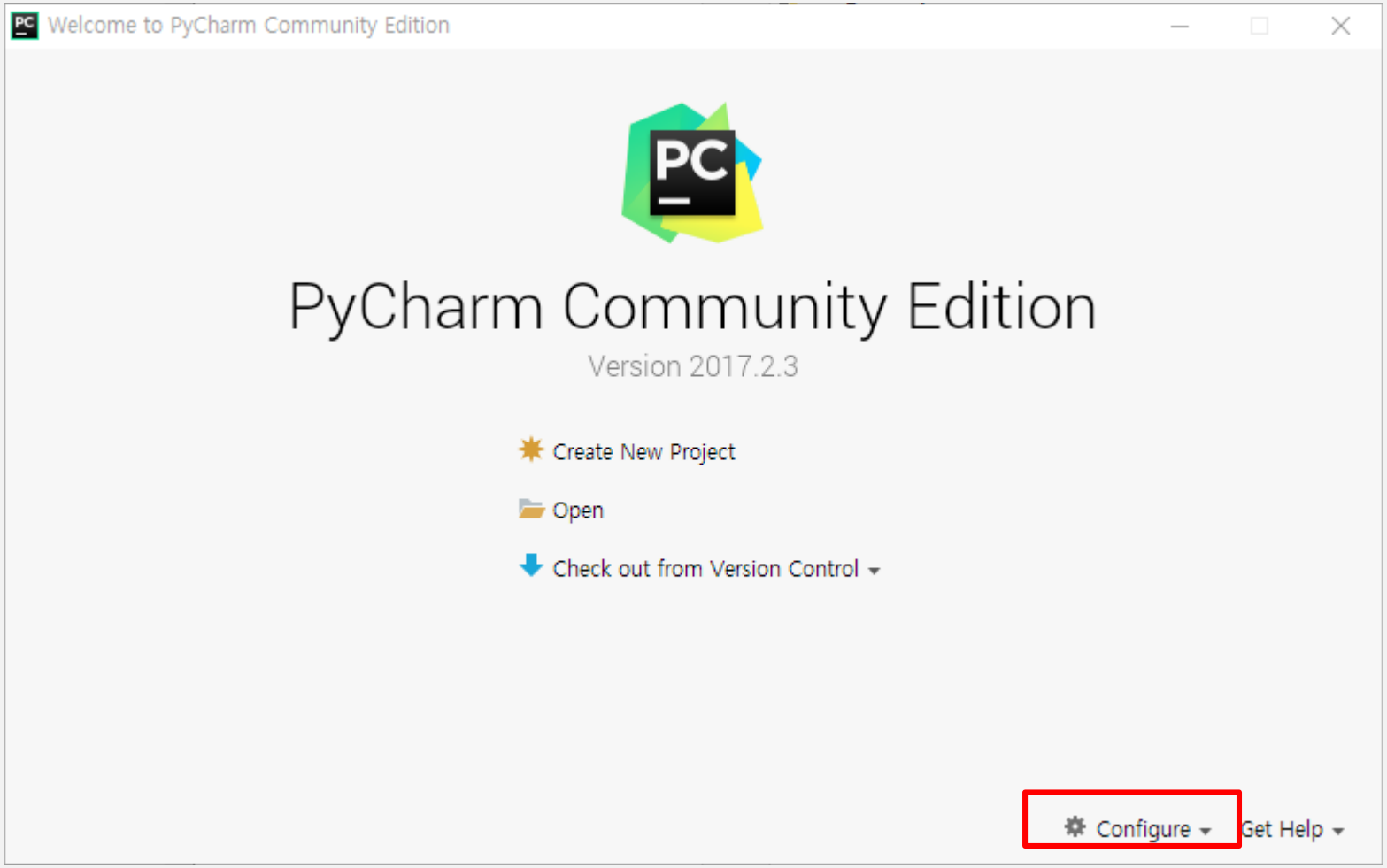
Python IDE



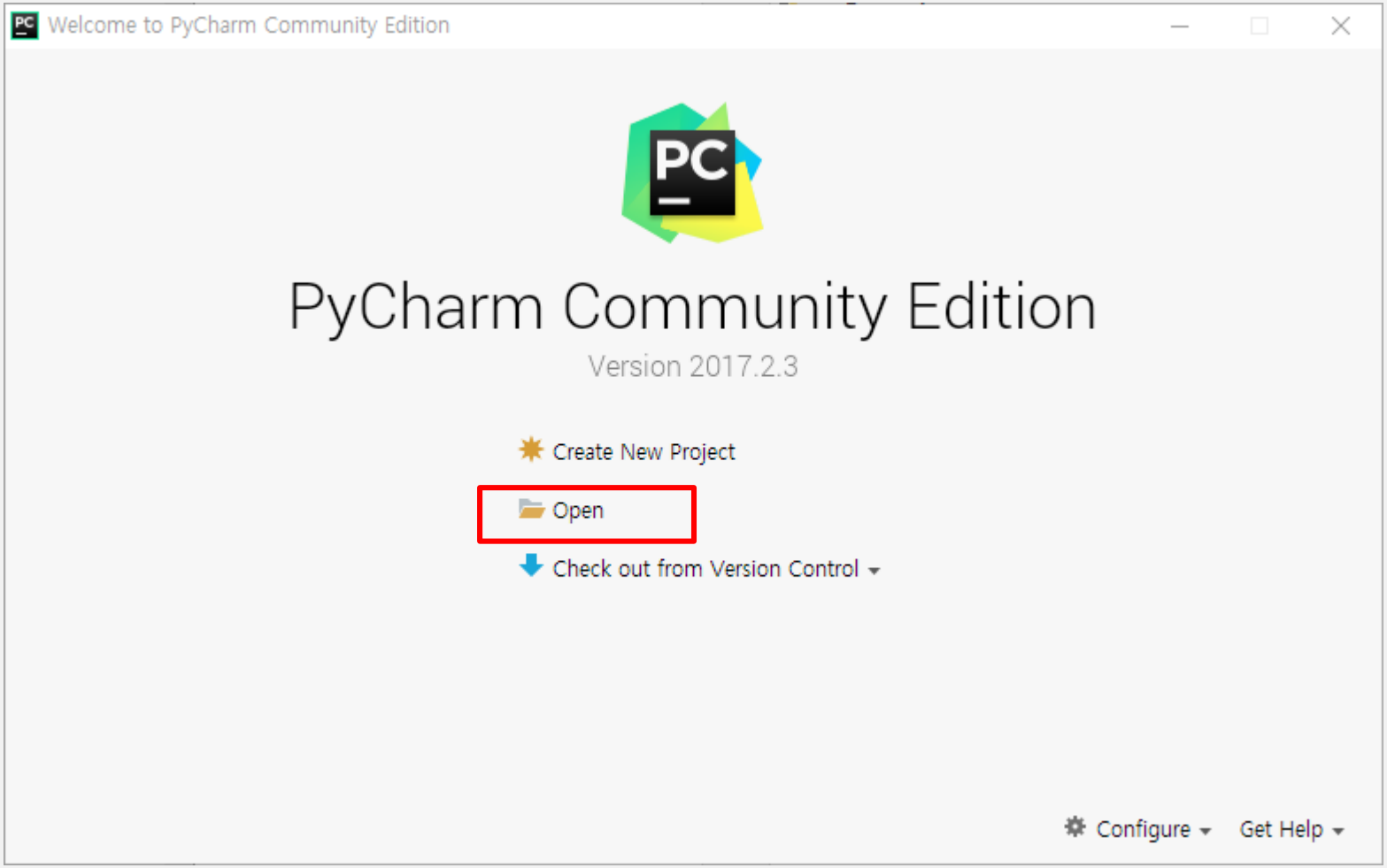


PyCharm 설치 (Community Edition)

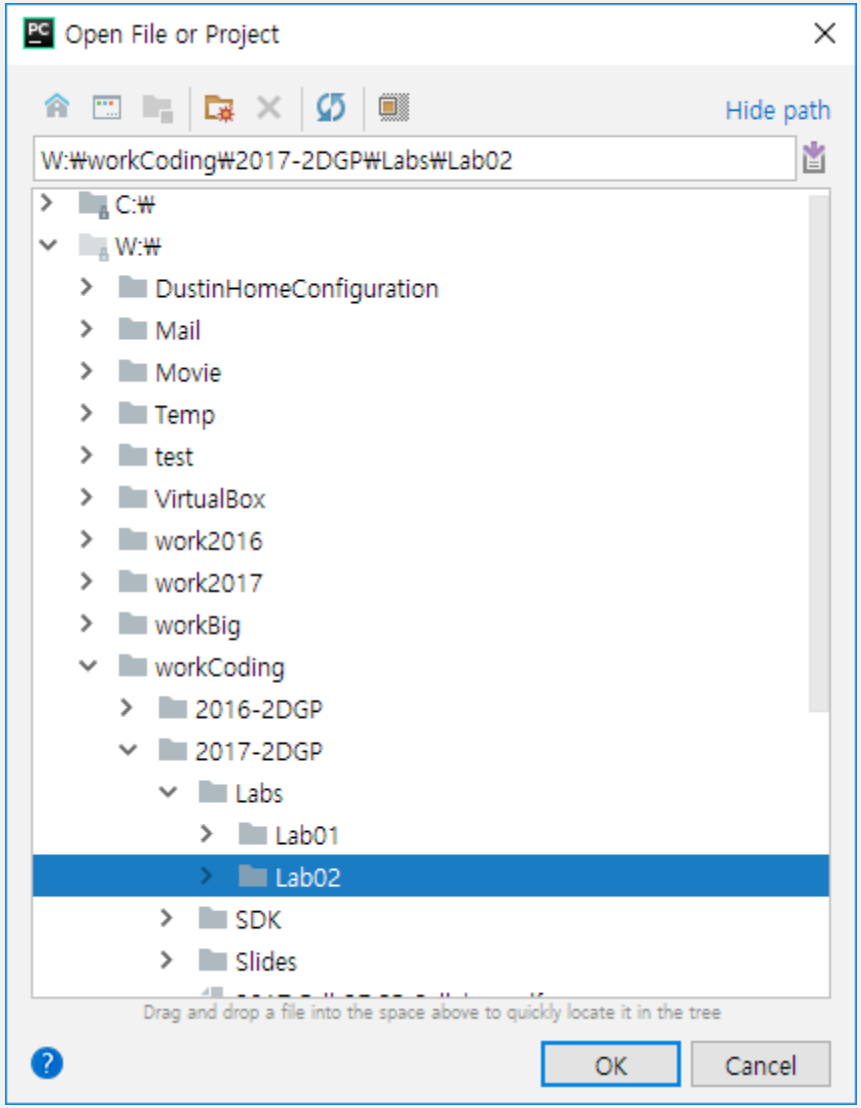




PyCharm의 실행



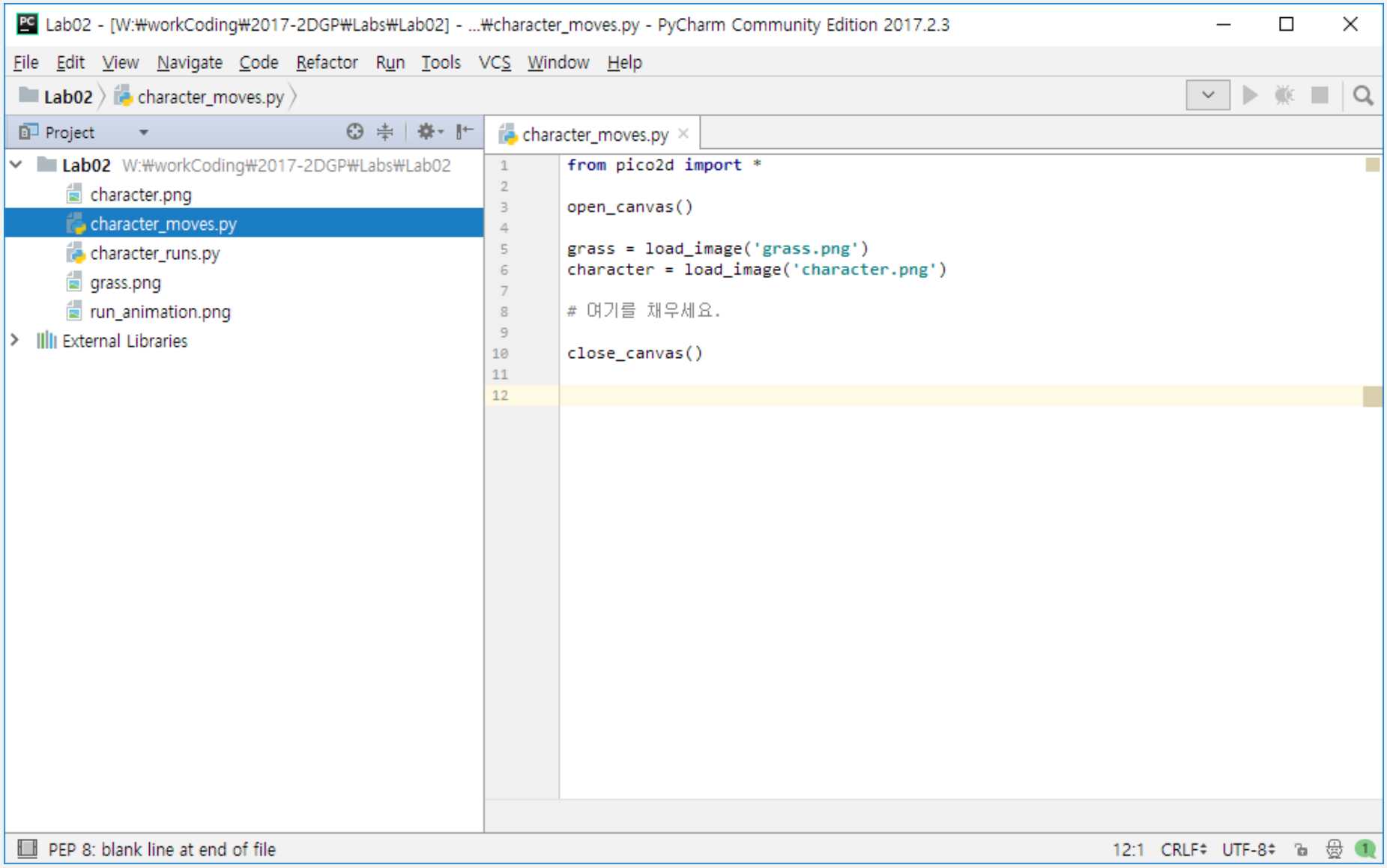
폴더 선택



실습

부드러운 캐릭터 이동

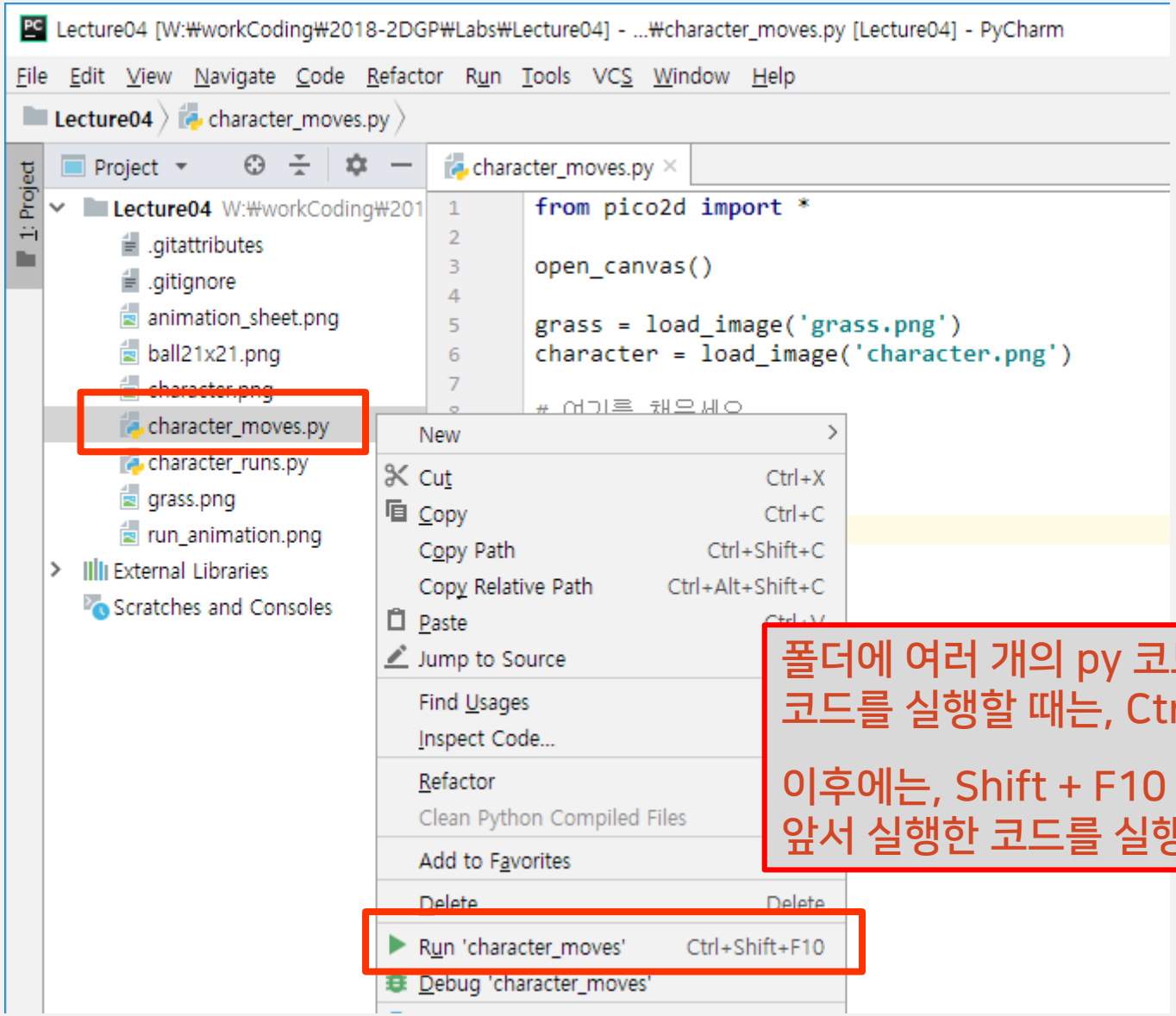
character_moves.py 선택 및 코드 입력



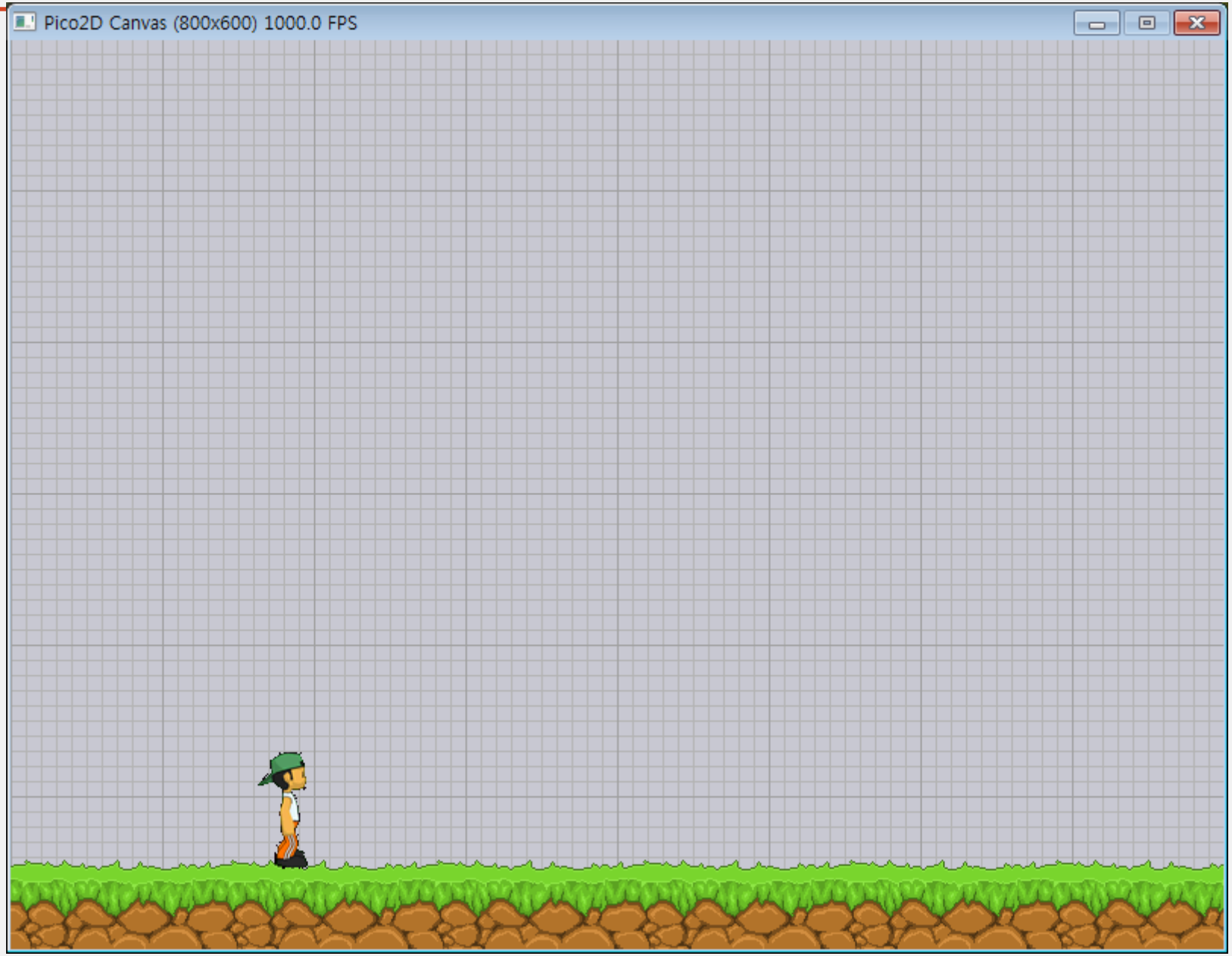
character_moves.py


```
from pico2d import *

open_canvas()

grass = load_image('grass.png')
character = load_image('character.png')

x = 0
while (x < 800):
    clear_canvas()
    grass.draw(400, 30)
    character.draw(x, 90)
    x = x + 2
    update_canvas()
    delay(0.01)
    get_events()

close_canvas()
```

선택한 코드의 실행(Ctrl + Shift + F10)



실행 결과



스프라이트(Sprite)

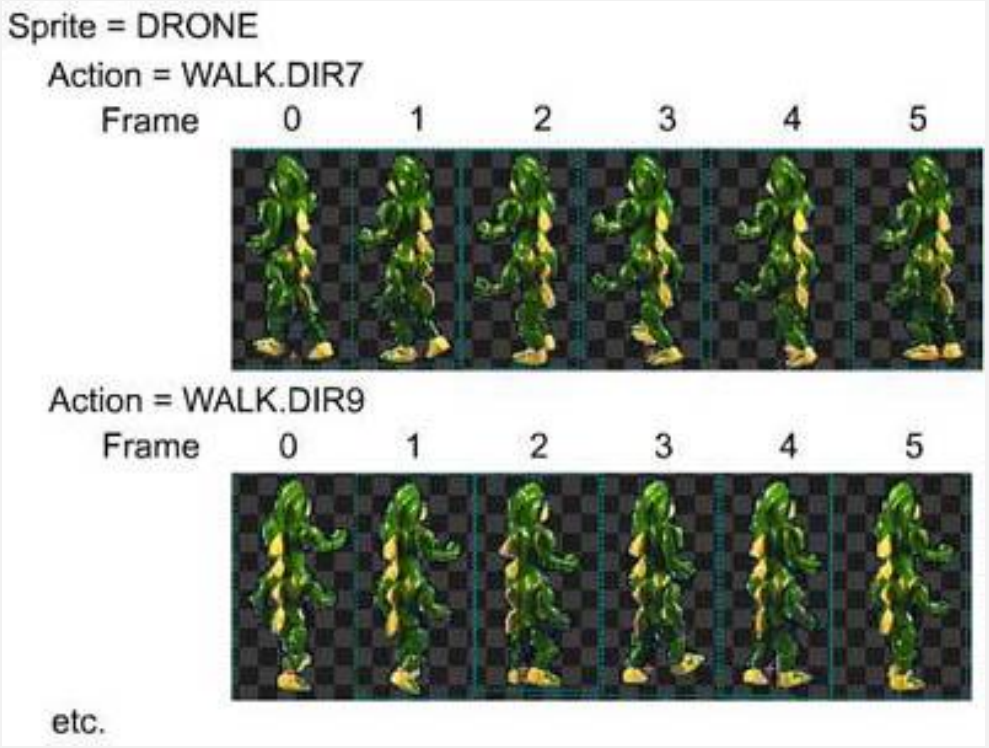
스프라이트란?

- 게임 장면안에서 보여지는 이미지 또는 애니매이션되는 오브젝트
- 2D 게임에서는 게임의 모든 캐릭터들과 이동하는 물체들을 표현하는 데 사용됨.
- 3D 게임에서는 2D로 표현될 수 있는 각종 오브젝트에 사용됨.
  - 불, 연기, 작은 물체들, UI 표시 등등.

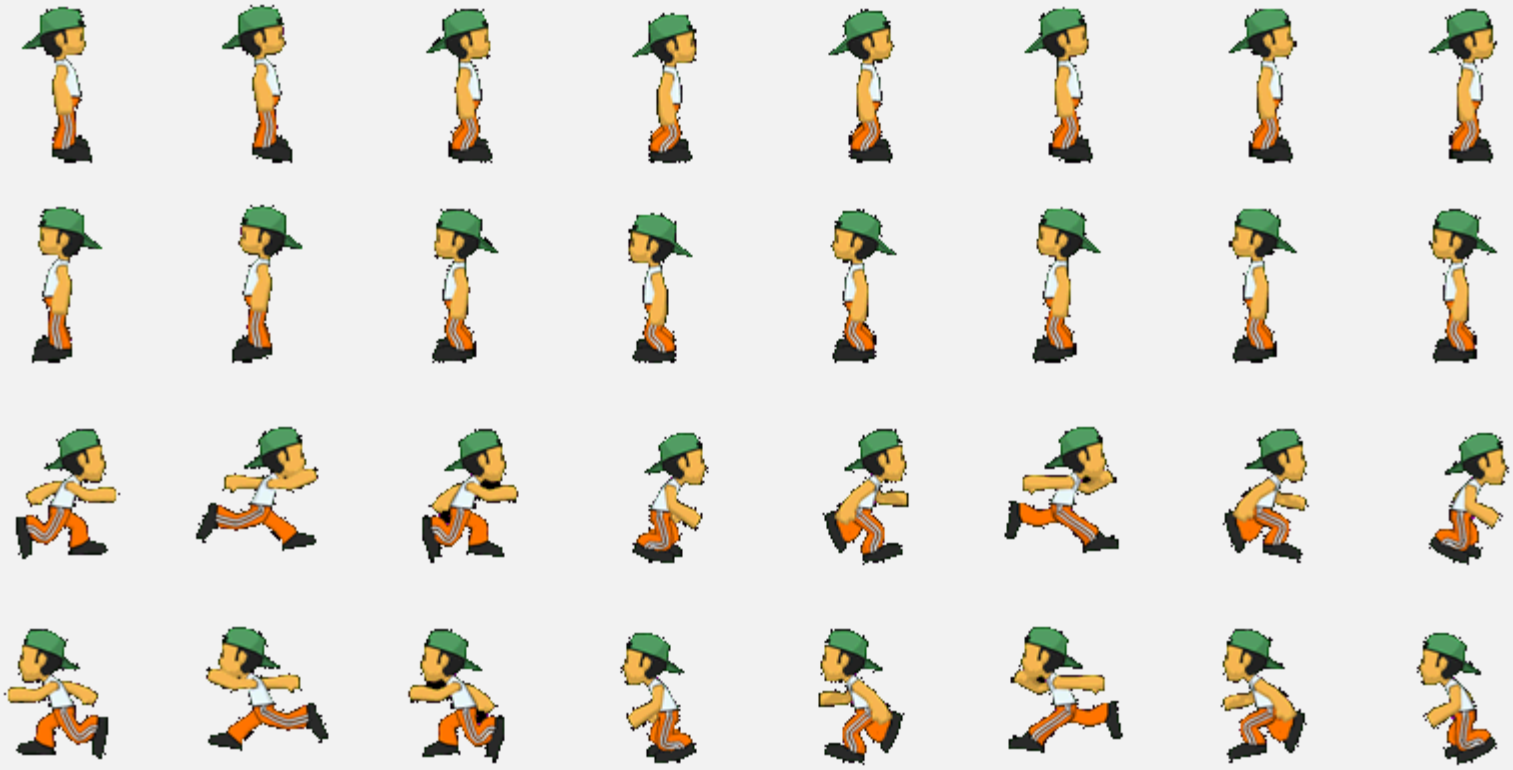
Metal Slug 3

애니메이션(Animation)

- **애니메이션이란?**
  - 여러 개의 이미지를 일정한 시간 간격을 통해서 화면에 뿌림으로써, 물체가 움직이는 효과를 주는 것.
  - 스프라이트는 여러 개의 action으로 구성됨.
    - Action: 달리기, 걷기, 제자리 동작 등과 같이 캐릭터의 움직임을 나타냄.
    - Action은 여러 개의 Frame으로 구성됨.
      - Frame은 한 개의 이미지



스프라이트 시트



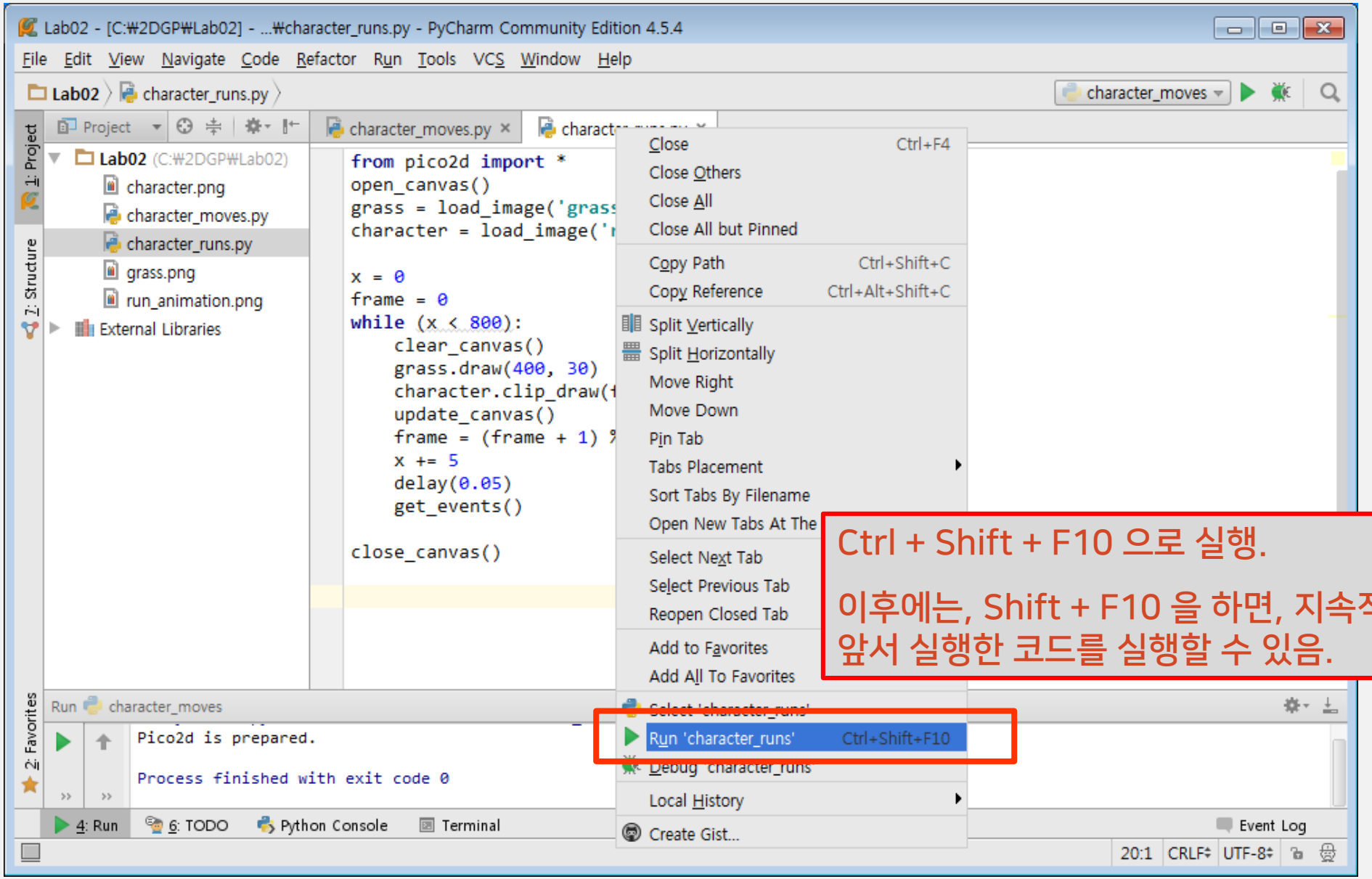
캐릭터 애니메이션

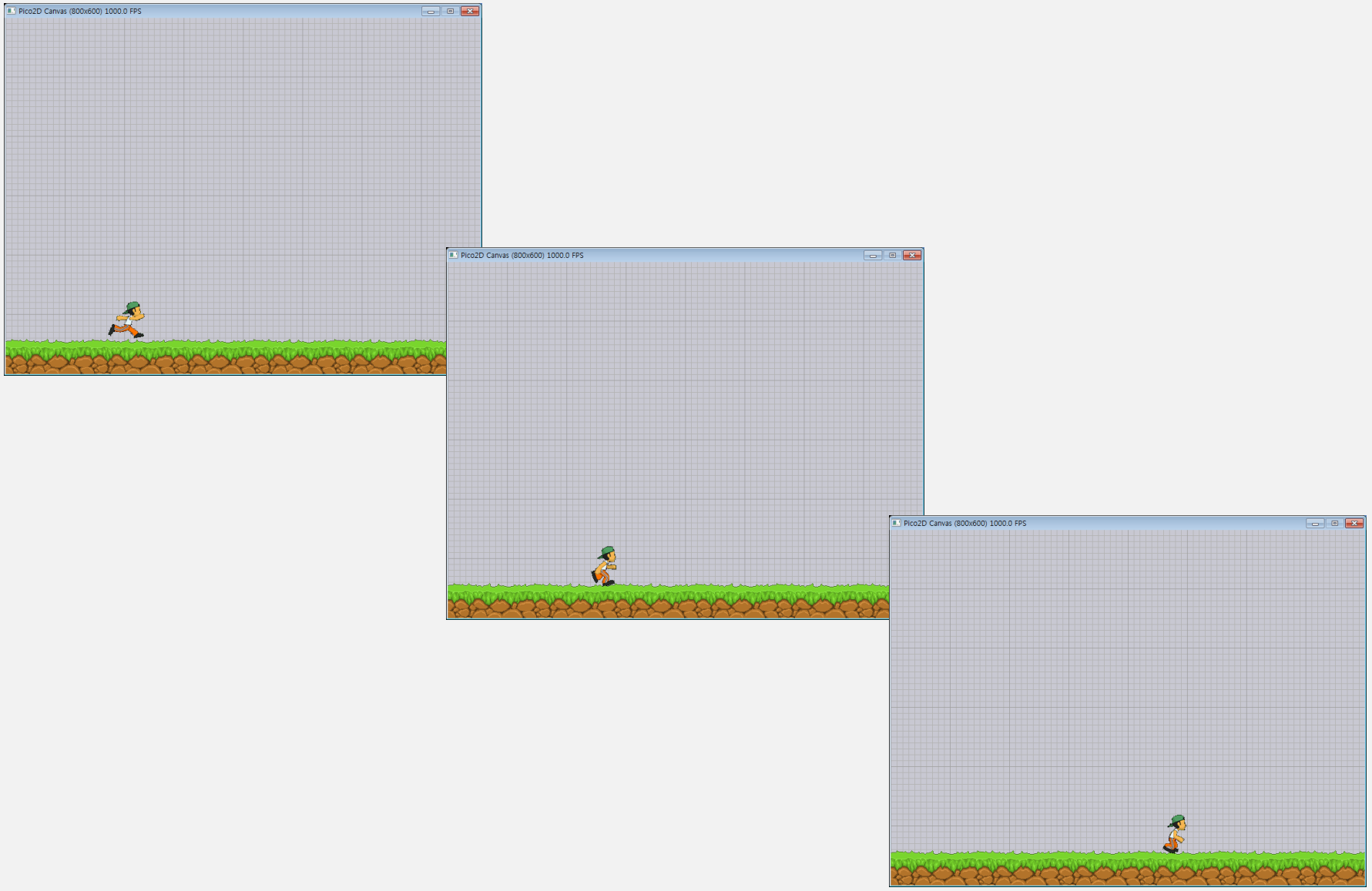
run_animation.png

character_runs.py


```
from pico2d import *
open_canvas()
grass = load_image('grass.png')
character = load_image('run_animation.png')

x = 0
frame = 0
while (x < 800):
    clear_canvas()
    grass.draw(400, 30)
    character.clip_draw(frame * 100, 0, 100, 100, x, 90)
    update_canvas()
    frame = (frame + 1) % 8
    x += 5
    delay(0.05)
    get_events()

close_canvas()
```

현재 Edit 중인 파일의 실행(Ctrl+Shift+F10)





clip_draw(left, bottom, width, height, x, y)