

Lecture #5. 애니메이션

2D 게임 프로그래밍

이대현 교수

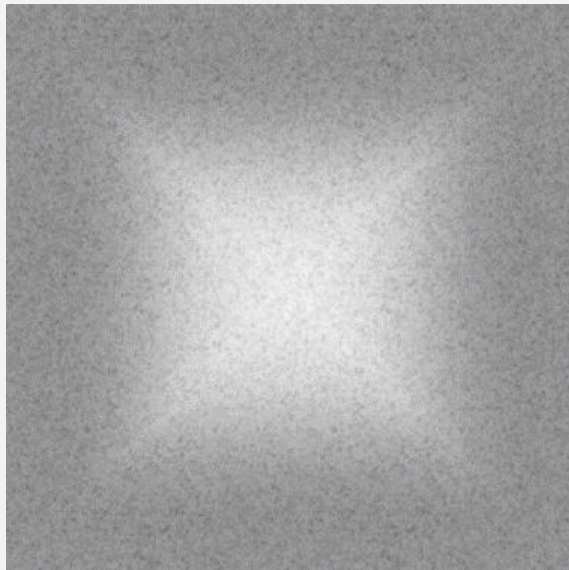


한국공학대학교
TECH UNIVERSITY OF KOREA

학습 내용

- 더블 버퍼링
- 플리핑
- 스프라이트 애니메이션

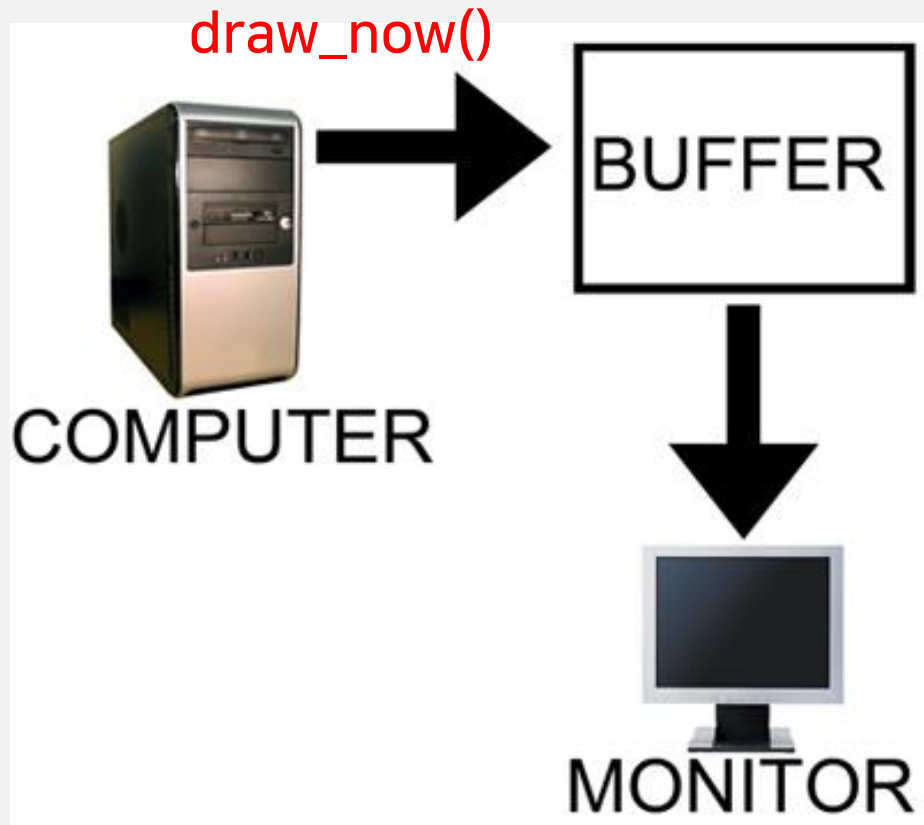
지난 번 실습의 문제점? - 화면 플리커링



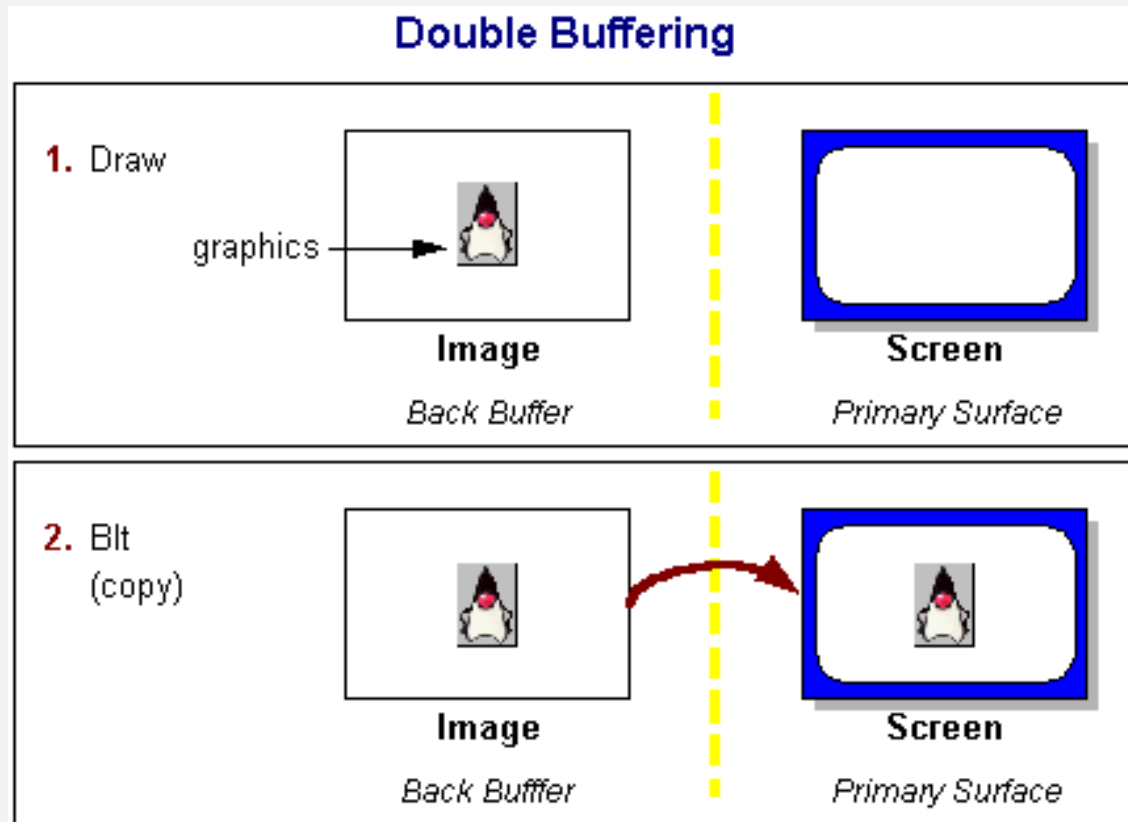
무대의 커튼은 왜 있을까?



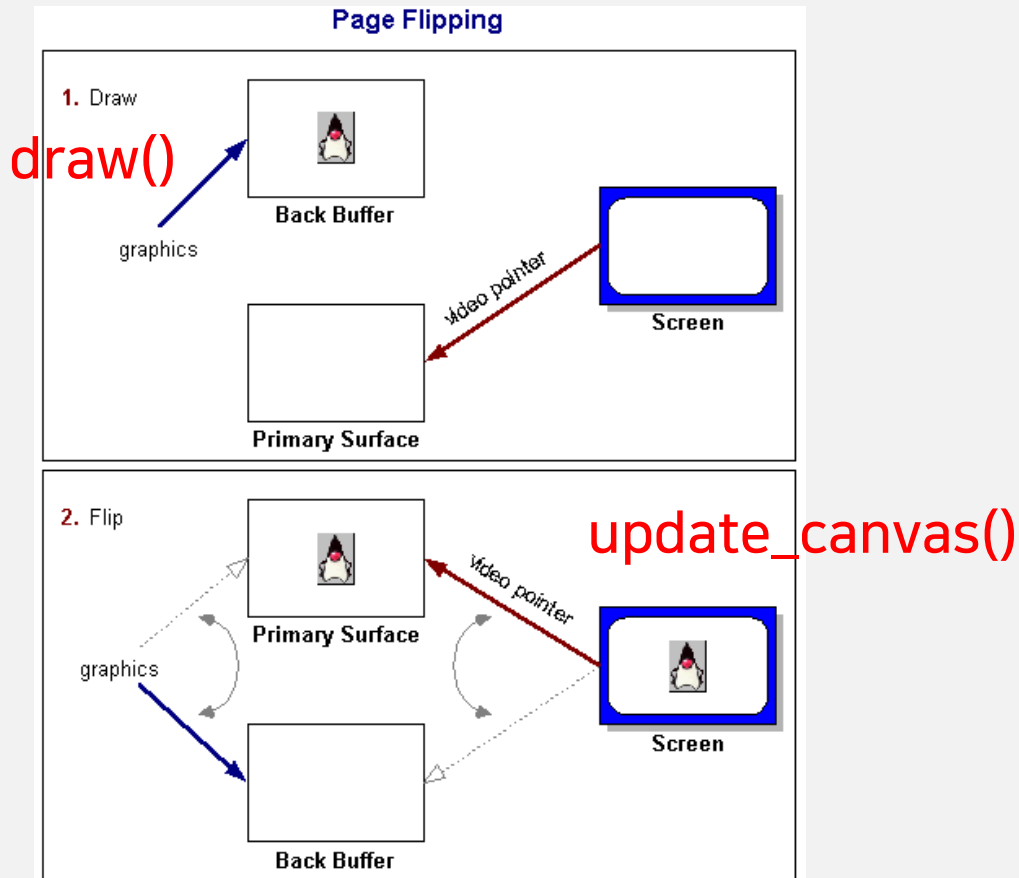
프레임 버퍼(Frame Buffer)



더블 버퍼링(Double Buffering)



페이지 플리핑(Page Flipping)



후면 버퍼(Back Buffer)에 그리기

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



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

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

Python IDE

- **PyCharm**

- 파이썬용으로 가장 많이 사용되는 IDE
- PC, 리눅스, 맥 등 다양한 환경에서 사용 가능

- **Visual Studio**

- C/C++/C# 이외에 파이썬 개발도 가능

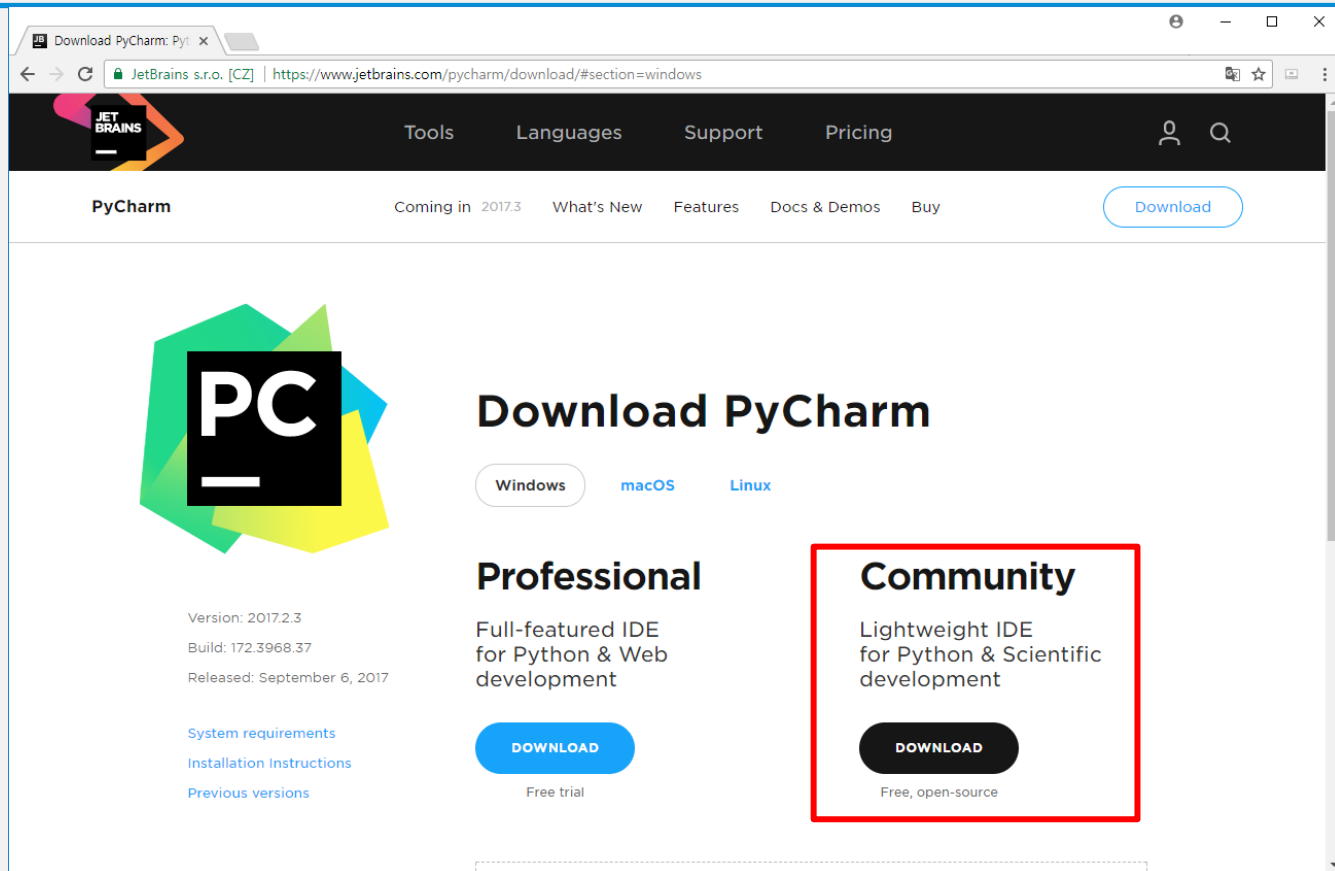
- **Visual Studio Code**

- 파이썬을 연계 사용 가능한 소스 코드 도구
- PC, Linux, 맥 등에서 공통적으로 사용 가능

PyCharm (<https://www.jetbrains.com/pycharm/>)



PyCharm 설치 – community version




The screenshot shows the JetBrains website's download page for PyCharm. The browser address bar shows the URL: <https://www.jetbrains.com/pycharm/download/#section=windows>. The page features a dark navigation bar with links for Tools, Languages, Support, and Pricing. Below this, a white section contains the PyCharm logo, version information (2017.2.3), and links for system requirements, installation instructions, and previous versions. The main content area is titled 'Download PyCharm' and offers three options: Windows, macOS, and Linux. Under the 'Professional' section, it describes it as a 'Full-featured IDE for Python & Web development' with a 'Free trial' download button. The 'Community' section, which is highlighted with a red border, describes it as a 'Lightweight IDE for Python & Scientific development' with a 'Free, open-source' download button.

Download PyCharm: Pyi x

JetBrains s.r.o. [CZ] | <https://www.jetbrains.com/pycharm/download/#section=windows>

Tools Languages Support Pricing

PyCharm Coming in 2017.3 What's New Features Docs & Demos Buy [Download](#)



Version: 2017.2.3
Build: 172.3968.37
Released: September 6, 2017

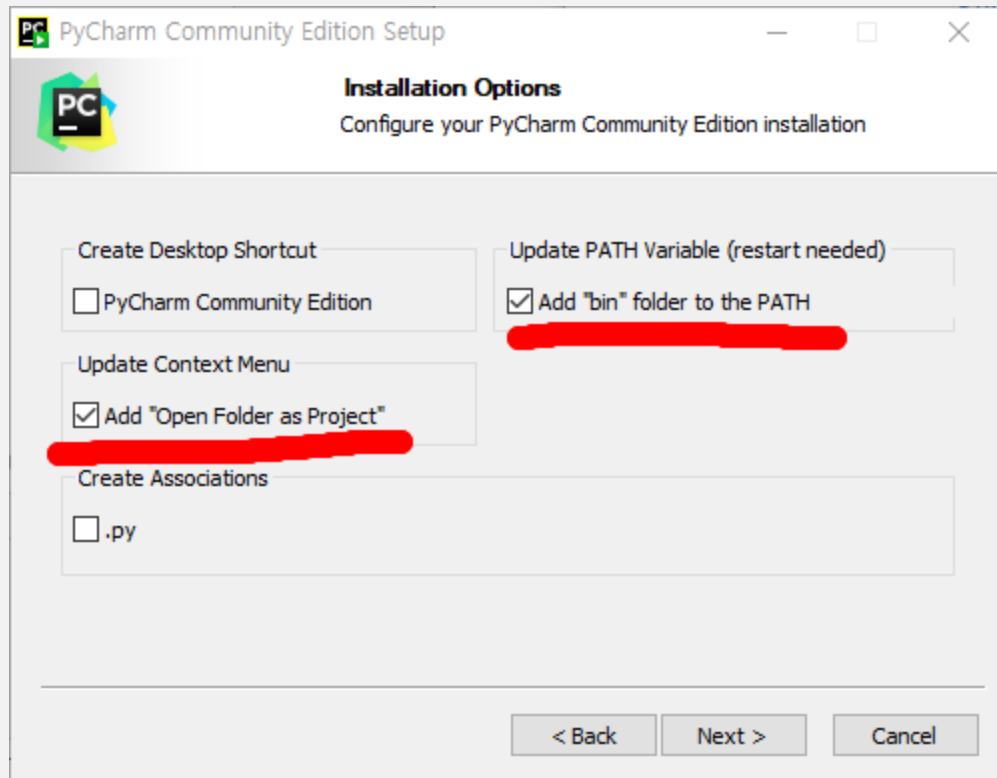
[System requirements](#)
[Installation instructions](#)
[Previous versions](#)

Download PyCharm

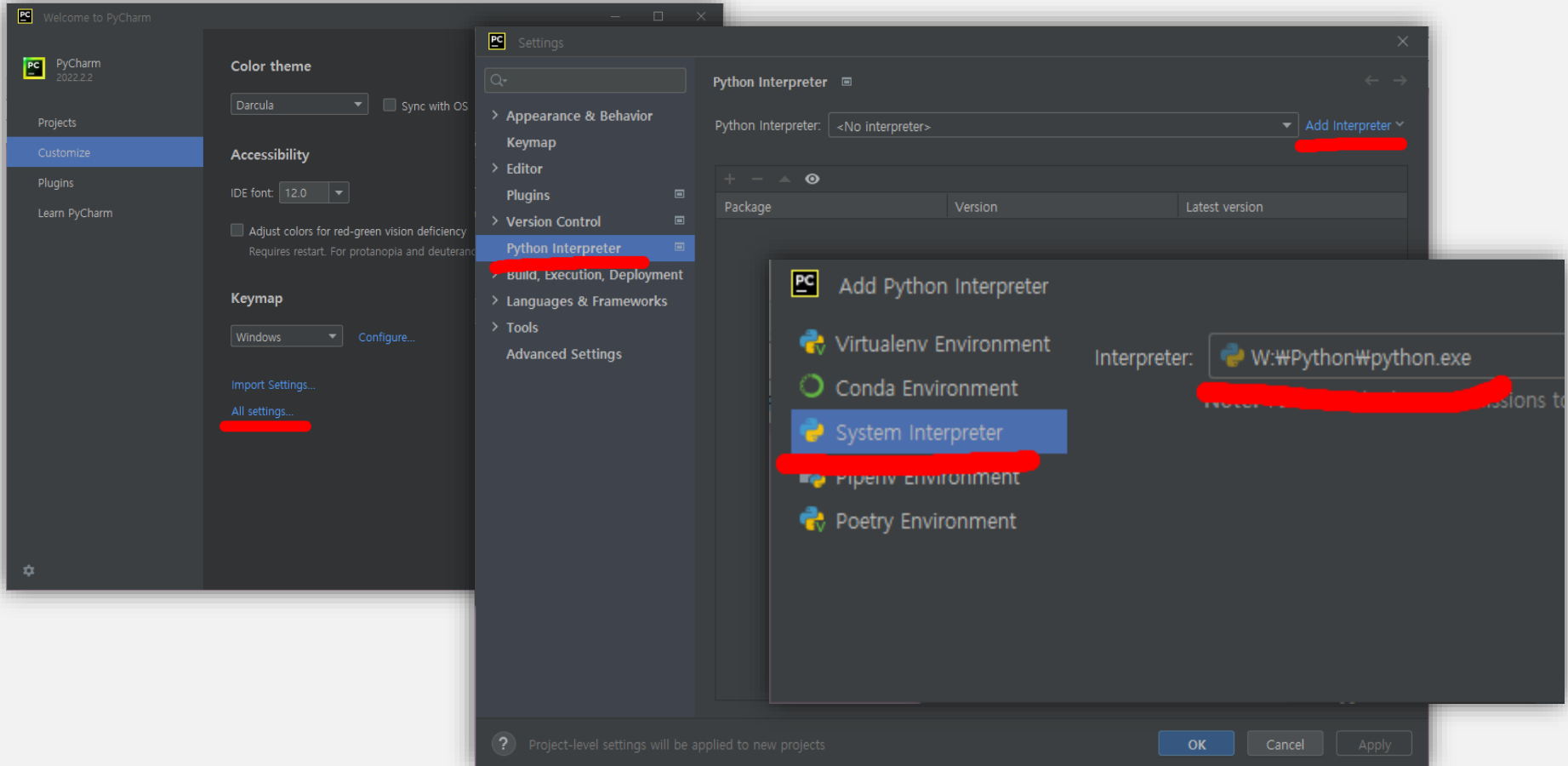
Windows macOS Linux

Professional
Full-featured IDE for Python & Web development
[DOWNLOAD](#)
Free trial

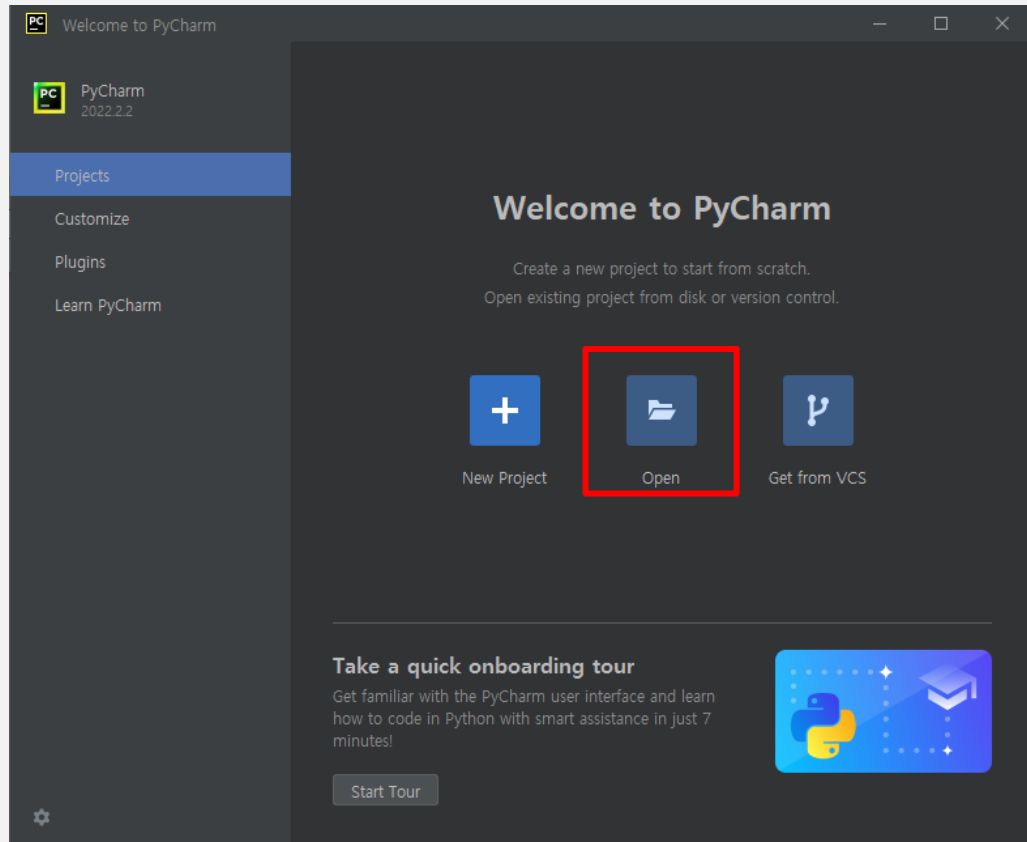
Community
Lightweight IDE for Python & Scientific development
[DOWNLOAD](#)
Free, open-source



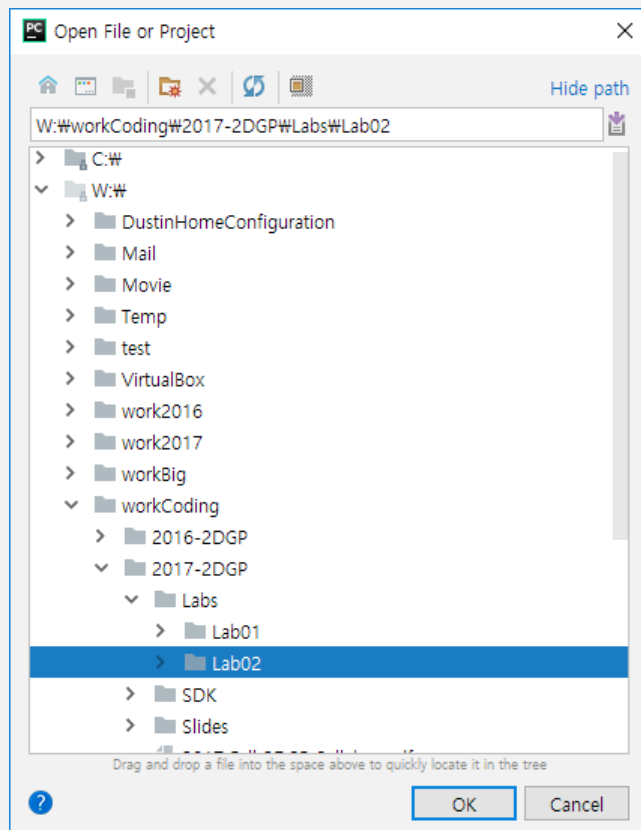
기본 설정 – System Interpreter



PyCharm의 실행



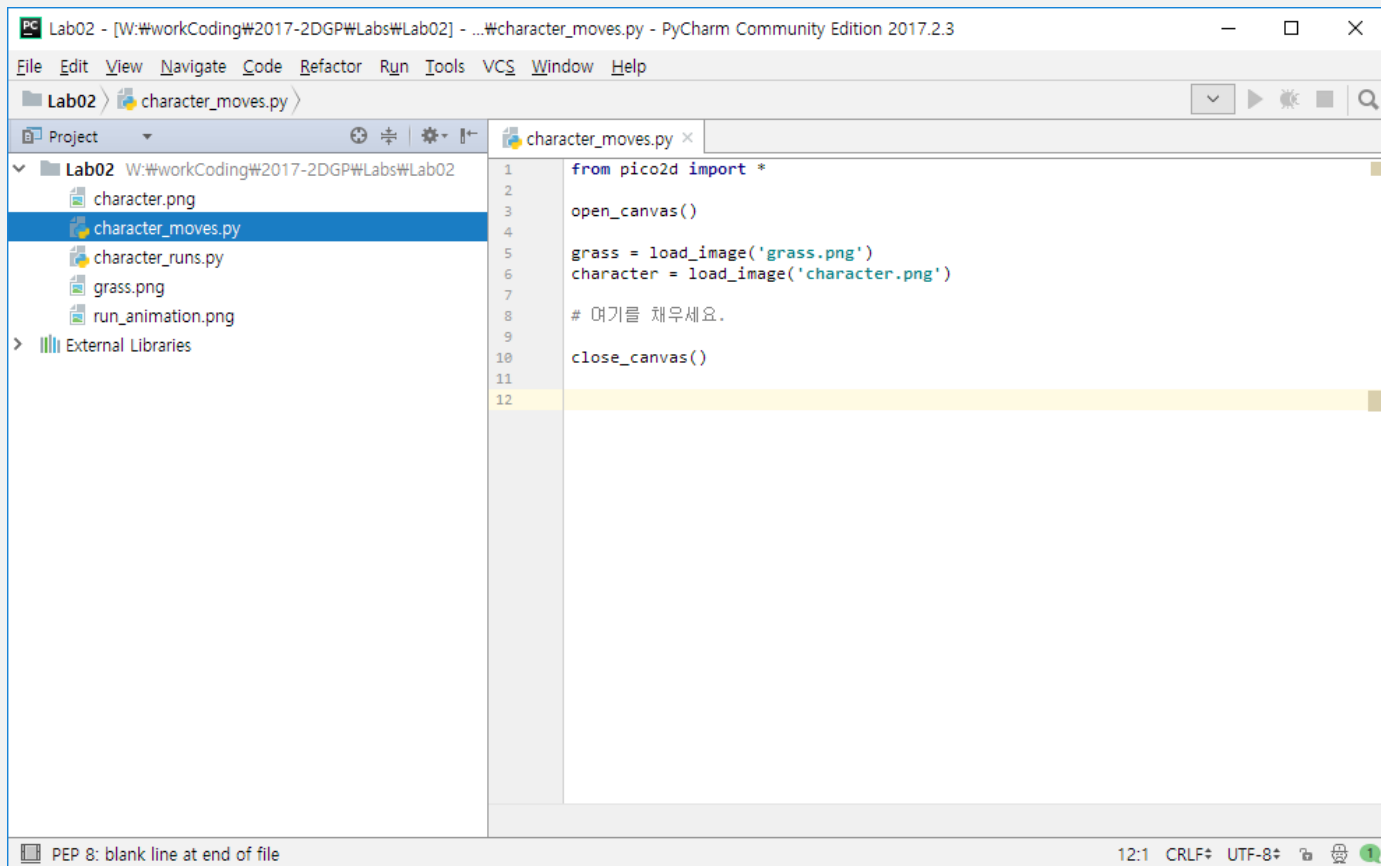
폴더 선택





부드러운 캐릭터 이동

character_moves.py 선택 및 코드 입력



character_moves.py



```
from pico2d import *

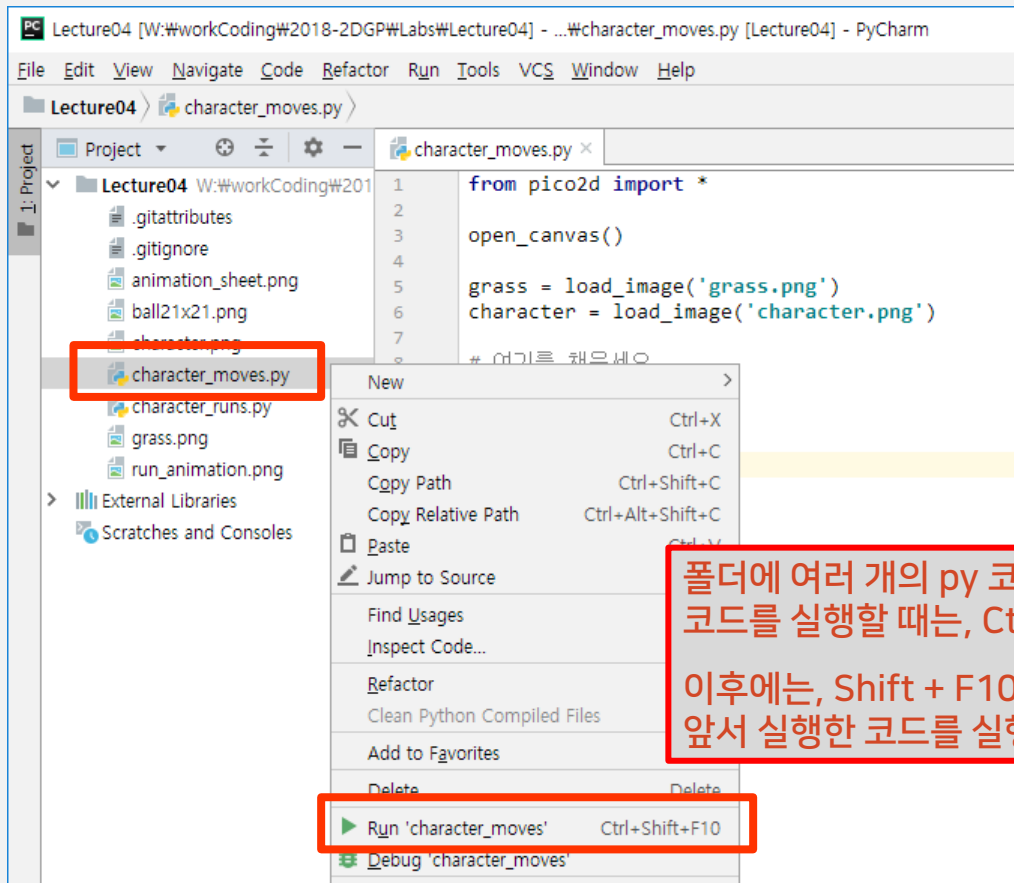
open_canvas()

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()
```

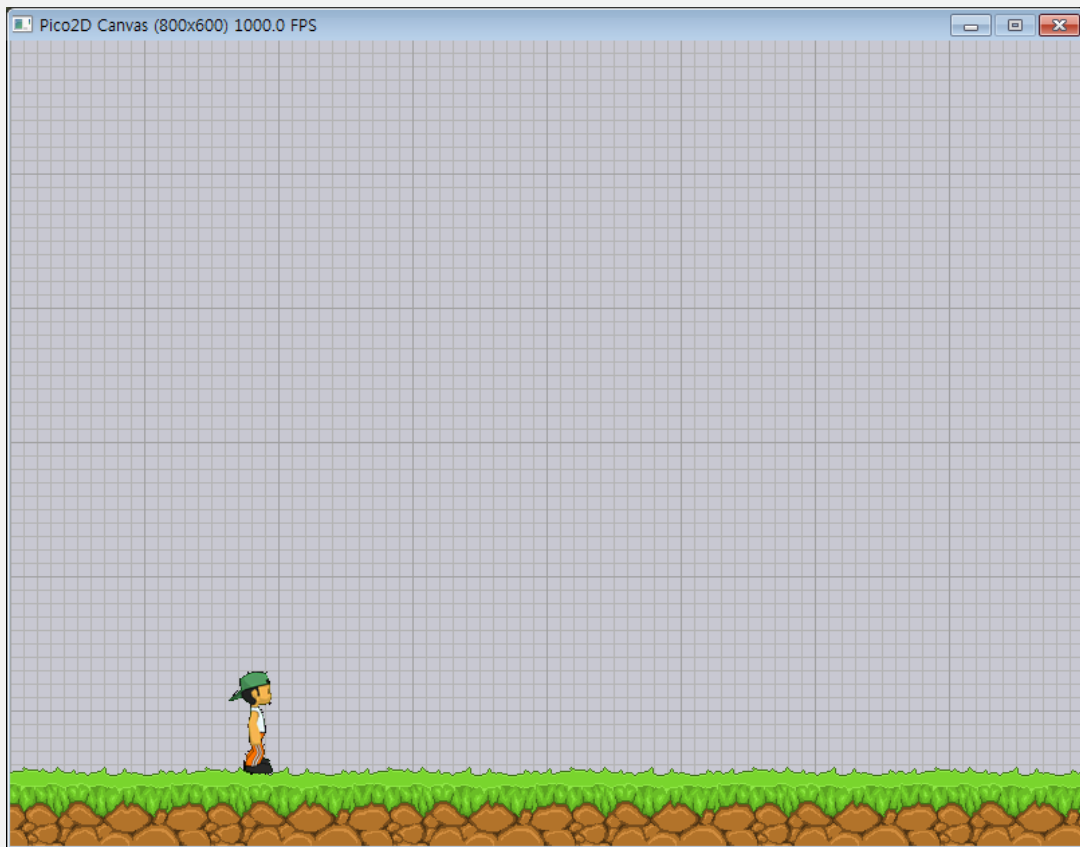
선택한 코드의 실행(Ctrl + Shift + F10)



폴더에 여러 개의 py 코드가 있을 경우, 선택한 코드를 실행할 때는, Ctrl + Shift + F10

이후에는, Shift + F10 을 하면, 지속적으로 앞서 실행한 코드를 실행할 수 있음.

실행 결과



스프라이트(Sprite)

■ 스프라이트란?

- 게임 장면안에서 보여지는 이미지 또는 애니메이션되는 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.

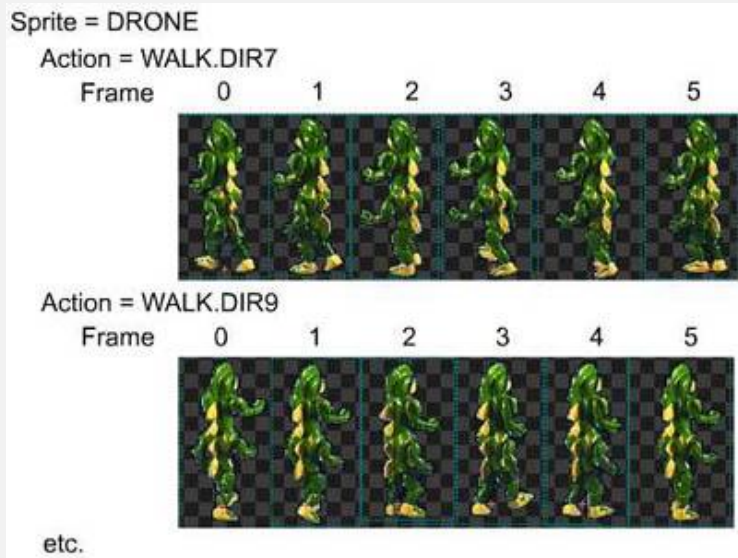


Metal Slug 3

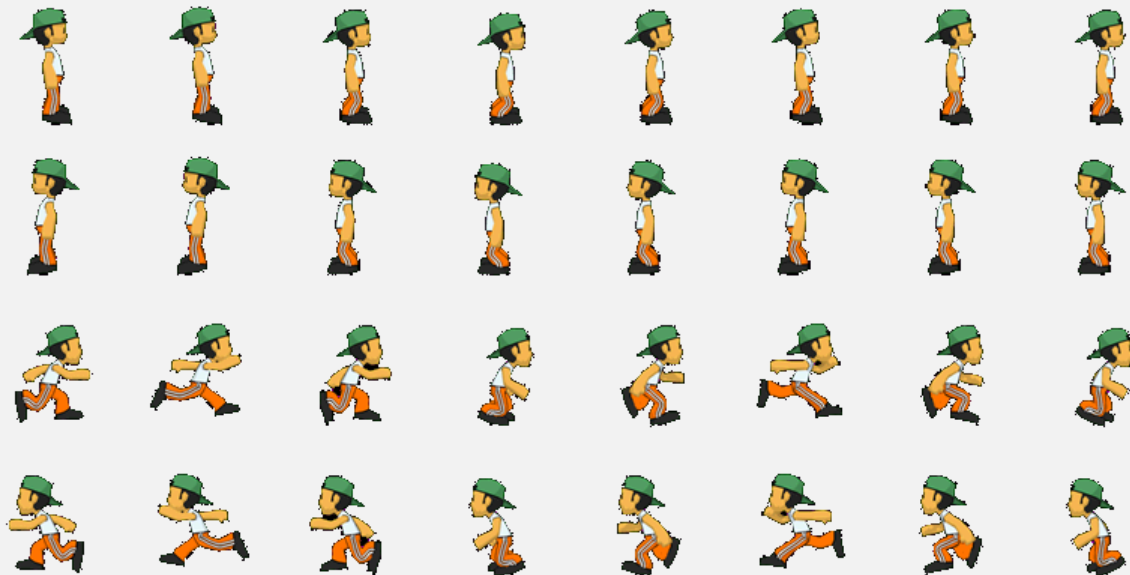
애니메이션(Animation)

■ 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



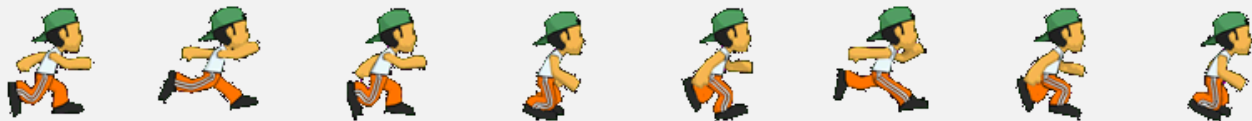
스프라이트 시트





캐릭터 애니메이션

run_animation.png



character_runs.py

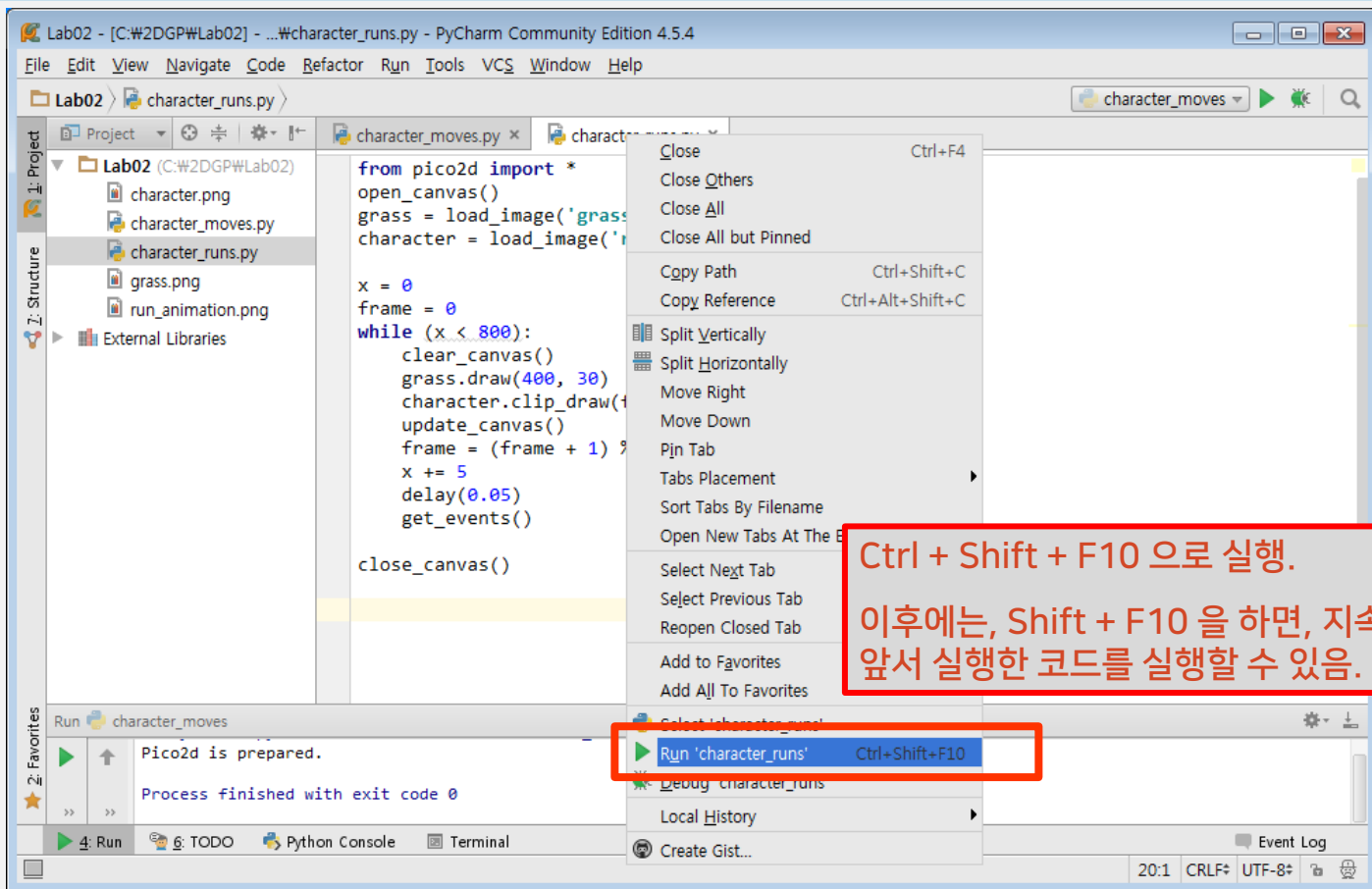


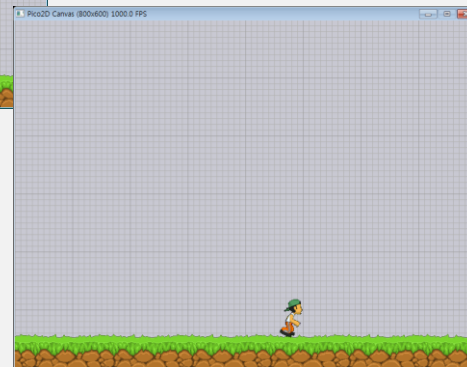
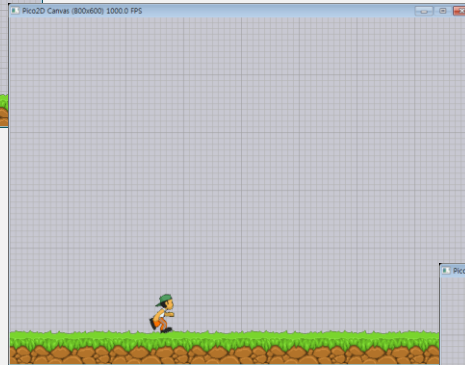
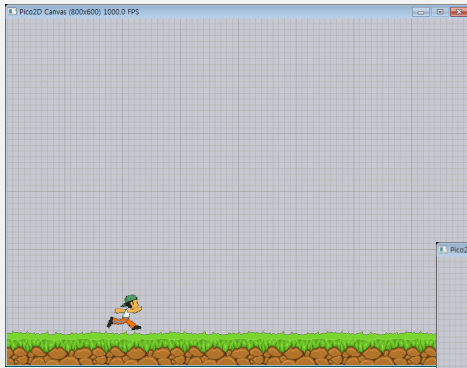
```
from pico2d import *
open_canvas()
grass = load_image('grass.png')
character = load_image('run_animation.png')

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)

