

Lecture #20. 사운드 및 패키징

2D 게임 프로그래밍

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학습 내용

- Pico2d의 사운드 플레이
- PyInstaller 를 이용한 실행 파일 building
- Installer의 제작



배경 음악 구현



```
class Court:
    def __init__(self):
        self.image = load_image('futsal_court.png')
        self.cw = get_canvas_width()
        self.ch = get_canvas_height()
        self.w = self.image.w
        self.h = self.image.h
        self.bgm = load_music('sound/football.mp3')
        self.bgm.set_volume(32)
        self.bgm.repeat_play()
```

Music 관련 function 들

- 음악 파일(mp3, ogg)의 로딩

- load_music(파일이름)

- 음악 연주 기능

- repeat_play() - 반복재생
- play(n) - n 번 재생
- set_volume(v) - 소리 크기 0~128
- get_volume() - 현재 소리 크기
- stop() - 중단
- pause() - 일시정지
- resume() - 재개

실습



이펙트사운드 구현

ball.py (1)



```
class Ball:
    image = None
    boy_eat_sound = None

    def __init__(self, x = None, y = None):
        if Ball.image == None:
            Ball.image = load_image('ball21x21.png')
        self.x = x if x else random.randint(100, common.court.w - 100)
        self.y = y if y else random.randint(100, common.court.h - 100)

        if not Ball.zombie_eat_sound:
            Ball.boy_eat_sound = load_wav('sound/pickup.wav')
            Ball.boy_eat_sound.set_volume(32)
```

ball.py (2)



```
def handle_collision(self, group, other):  
    if group == 'boy:ball':  
        Ball.boy_eat_sound.play()  
        game_world.remove_object(self)
```


Wav 관련 function 들

- 이펙트 파일(wav)의 로딩
 - load_wav(파일이름)
- 이펙트 재생 기능
 - repeat_play() - 반복재생
 - play(n) - n 번 재생
 - set_volume(v) - 소리 크기 0~128
 - get_volume() - 현재 소리 크기

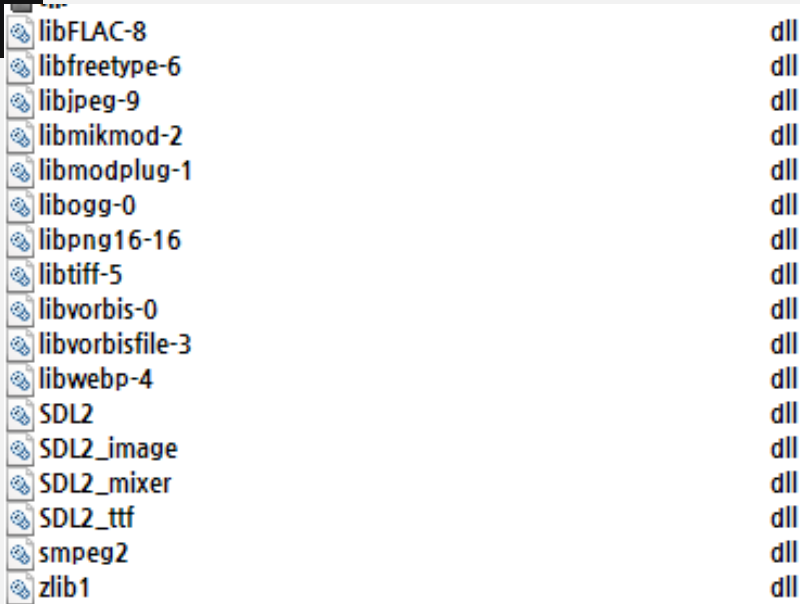
mygame.py가 실행되기 위해 필요로 하는 것들... (1)

- 여러분이 작성한 000.py
- 리소스: image, font, mp3, wav 파일 등등

mygame.py가 실행되기 위해 필요로 하는 것들...(2)

■ Pico2d 가 활용하는 SDL 라이브러리 DLL

```
import pico2d
import os
print(os.getenv('PYSDL2_DLL_PATH'))
```



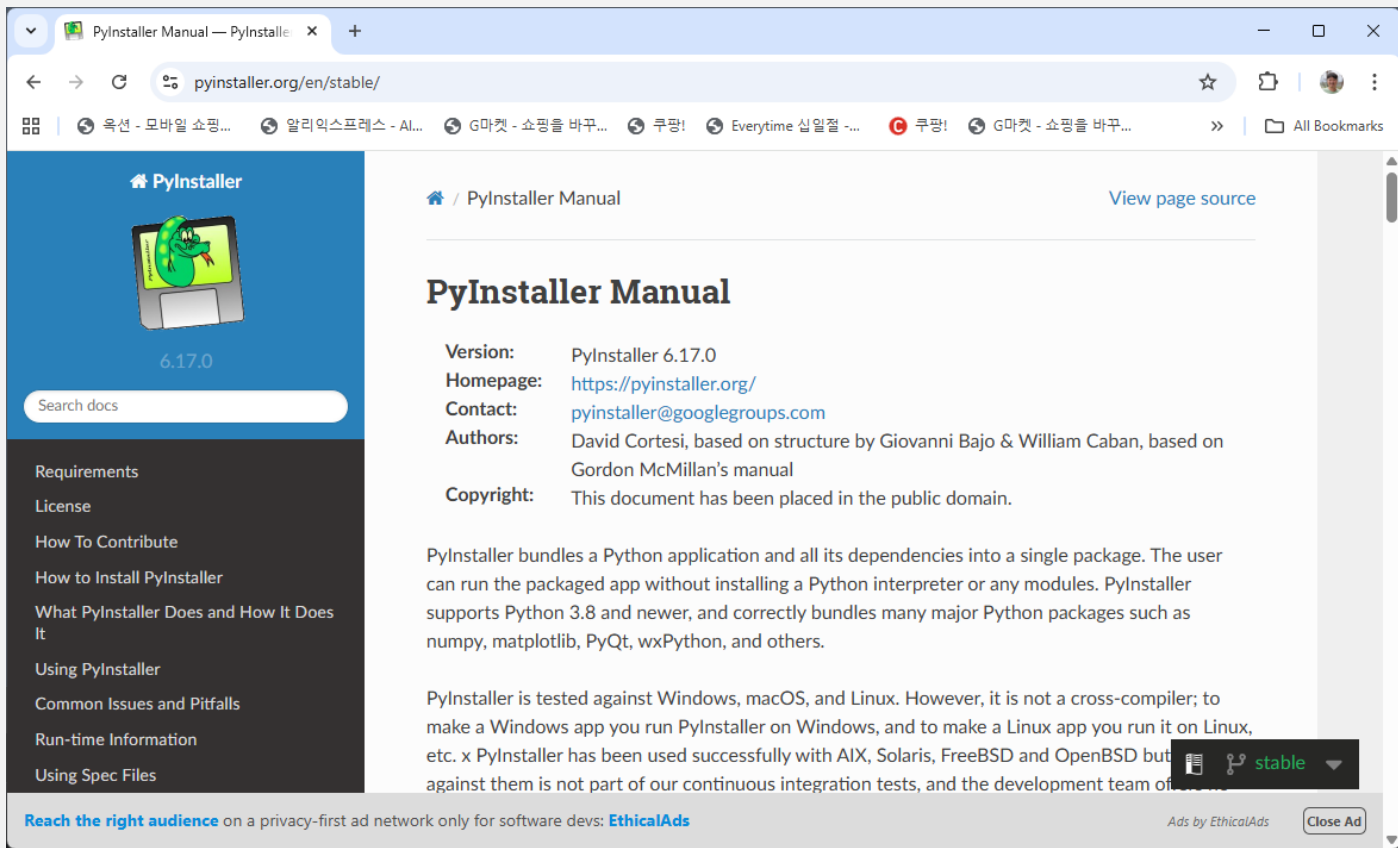
libFLAC-8	.dll
libfreetype-6	.dll
libjpeg-9	.dll
libmikmod-2	.dll
libmodplug-1	.dll
libogg-0	.dll
libpng16-16	.dll
libtiff-5	.dll
libvorbis-0	.dll
libvorbisfile-3	.dll
libwebp-4	.dll
SDL2	.dll
SDL2_image	.dll
SDL2_mixer	.dll
SDL2_ttf	.dll
smpeg2	.dll
zlib1	.dll



mygame.py 를
Mygame.exe 로 변환

PyInstaller

■ <http://www.pyinstaller.org/>



The screenshot shows a web browser displaying the PyInstaller Manual page. The browser's address bar shows the URL `pyinstaller.org/en/stable/`. The page has a blue header with the PyInstaller logo and version 6.17.0. A sidebar on the left contains a search bar and a list of navigation links: Requirements, License, How To Contribute, How to Install PyInstaller, What PyInstaller Does and How It Does It, Using PyInstaller, Common Issues and Pitfalls, Run-time Information, and Using Spec Files. The main content area is titled 'PyInstaller Manual' and includes a 'View page source' link. Below the title, there is a table of metadata: Version (PyInstaller 6.17.0), Homepage (<https://pyinstaller.org/>), Contact (pyinstaller@googlegroups.com), Authors (David Cortesi, based on structure by Giovanni Bajo & William Caban, based on Gordon McMillan's manual), and Copyright (This document has been placed in the public domain.). The main text describes PyInstaller as a tool that bundles a Python application and its dependencies into a single package, supporting Python 3.8 and newer, and various Python packages like numpy, matplotlib, PyQt, and wxPython. It also mentions that PyInstaller is tested against Windows, macOS, and Linux, but is not a cross-compiler. At the bottom of the page, there is a footer with the text 'Reach the right audience on a privacy-first ad network only for software devs: EthicalAds' and a 'Close Ad' button.

PyInstaller Manual — PyInstalle x +

pyinstaller.org/en/stable/

PyInstaller

6.17.0

Search docs

Requirements

License

How To Contribute

How to Install PyInstaller

What PyInstaller Does and How It Does It

Using PyInstaller

Common Issues and Pitfalls

Run-time Information

Using Spec Files

PyInstaller Manual

View page source

PyInstaller Manual

Version: PyInstaller 6.17.0

Homepage: <https://pyinstaller.org/>

Contact: pyinstaller@googlegroups.com

Authors: David Cortesi, based on structure by Giovanni Bajo & William Caban, based on Gordon McMillan's manual

Copyright: This document has been placed in the public domain.

PyInstaller bundles a Python application and all its dependencies into a single package. The user can run the packaged app without installing a Python interpreter or any modules. PyInstaller supports Python 3.8 and newer, and correctly bundles many major Python packages such as numpy, matplotlib, PyQt, wxPython, and others.

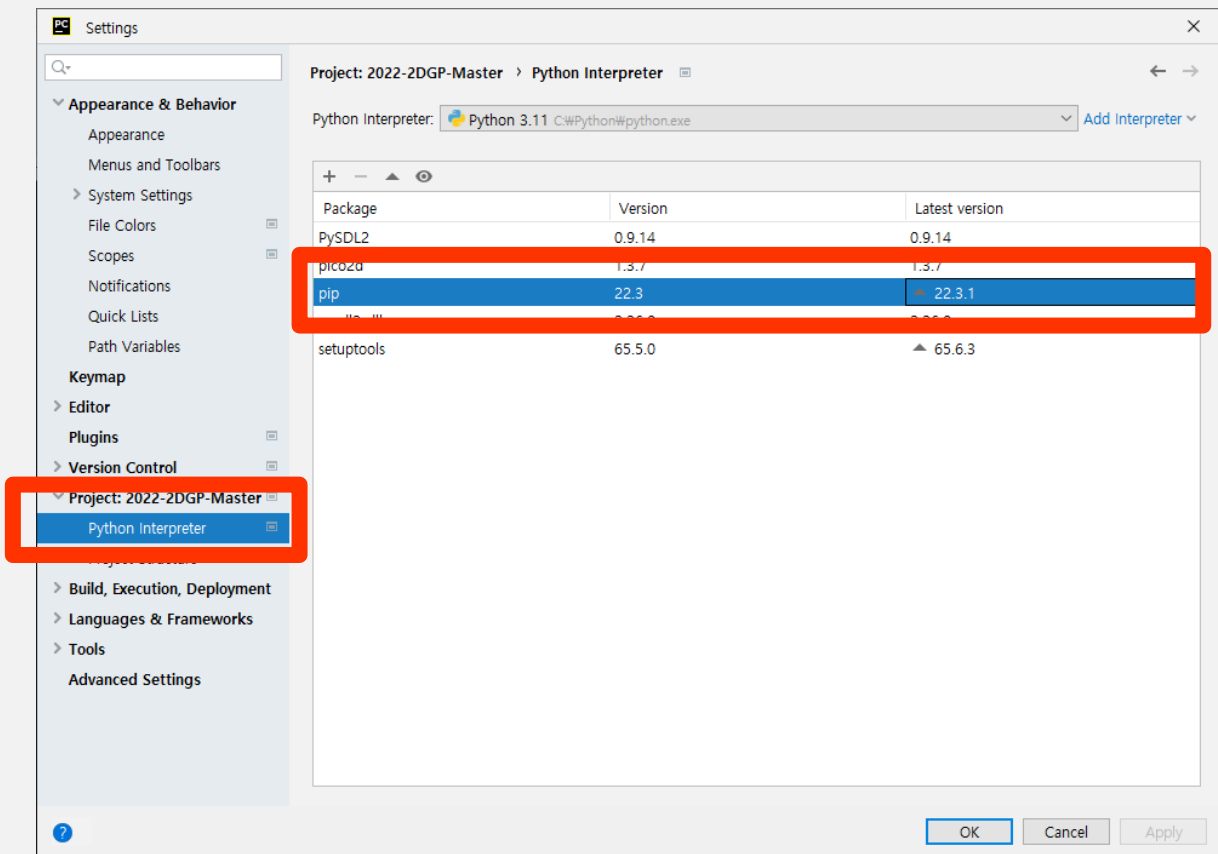
PyInstaller is tested against Windows, macOS, and Linux. However, it is not a cross-compiler; to make a Windows app you run PyInstaller on Windows, and to make a Linux app you run it on Linux, etc. x PyInstaller has been used successfully with AIX, Solaris, FreeBSD and OpenBSD but support against them is not part of our continuous integration tests, and the development team of PyInstaller does not plan to add support for them.

Reach the right audience on a privacy-first ad network only for software devs: [EthicalAds](#)

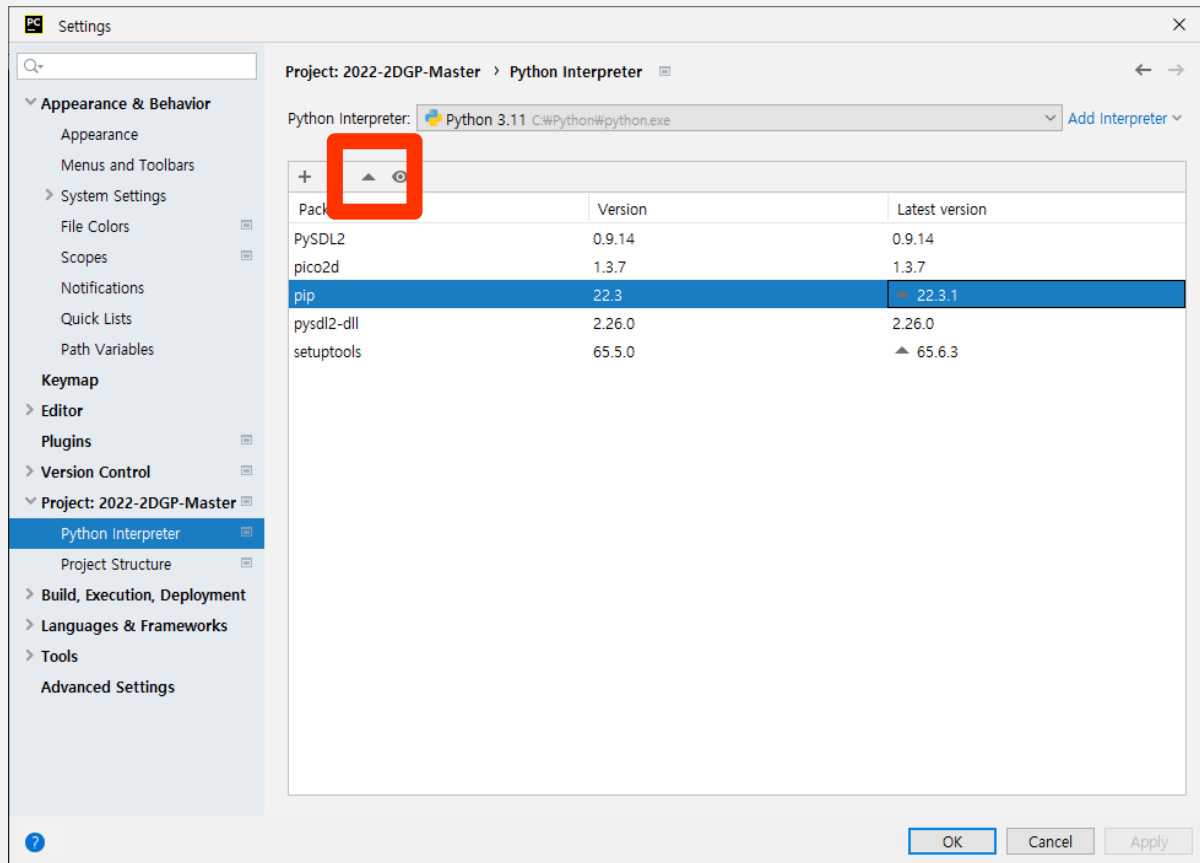
Ads by EthicalAds

Close Ad

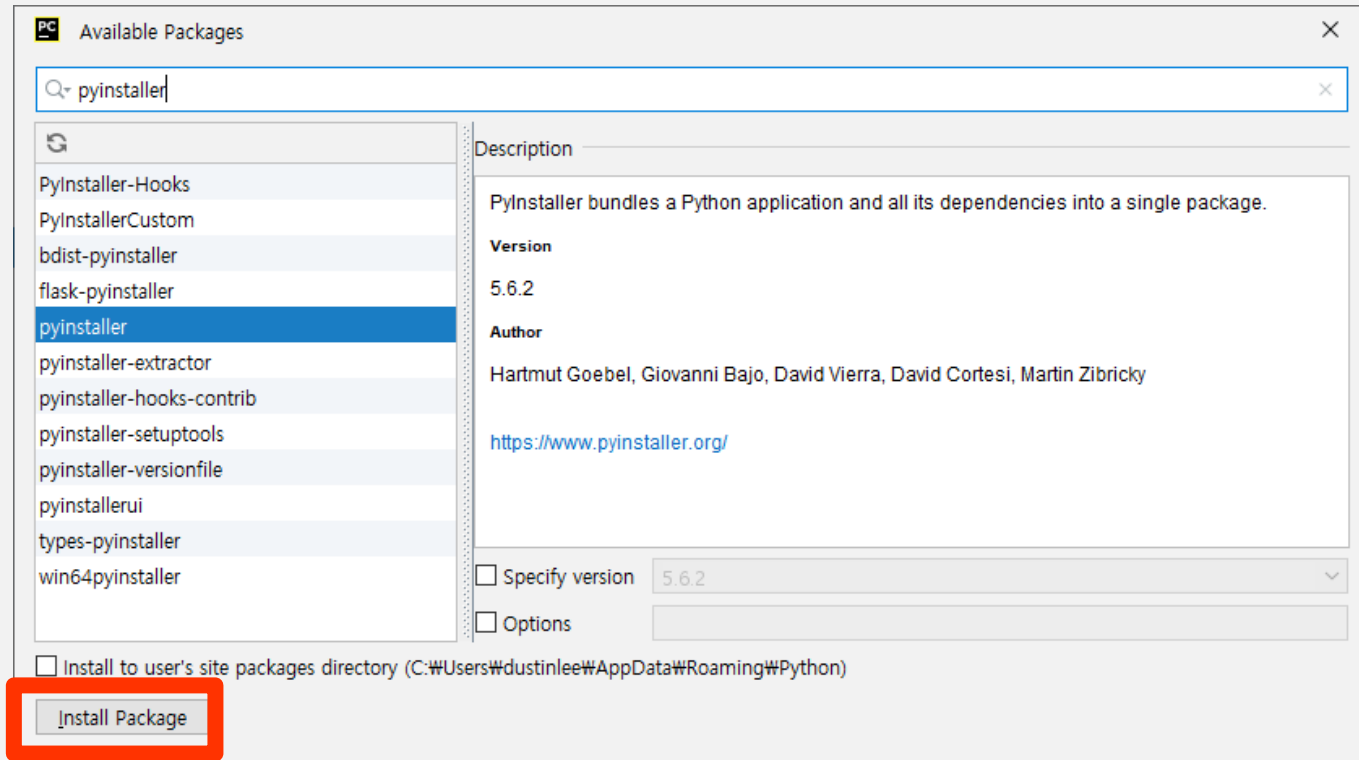
PyCharm: pip 설치 확인



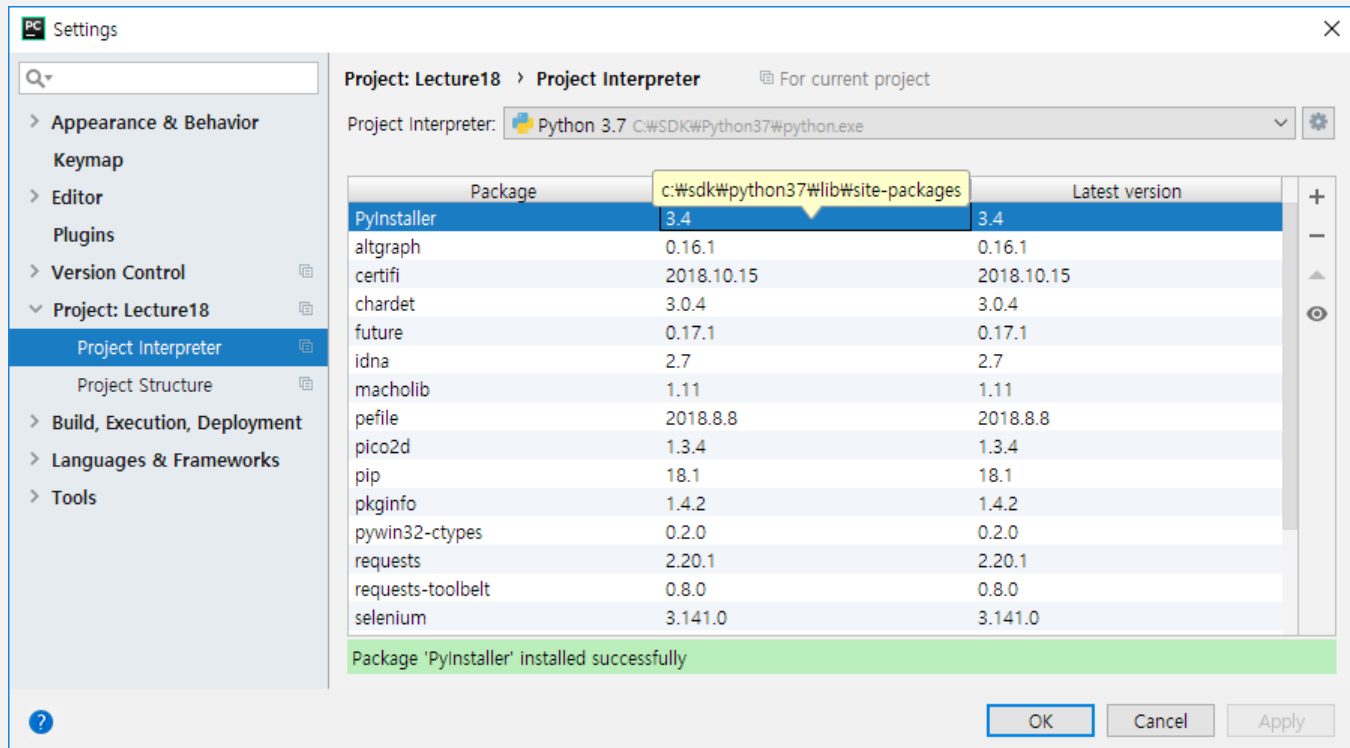
PyCharm: pip 설치 및 version upgrade



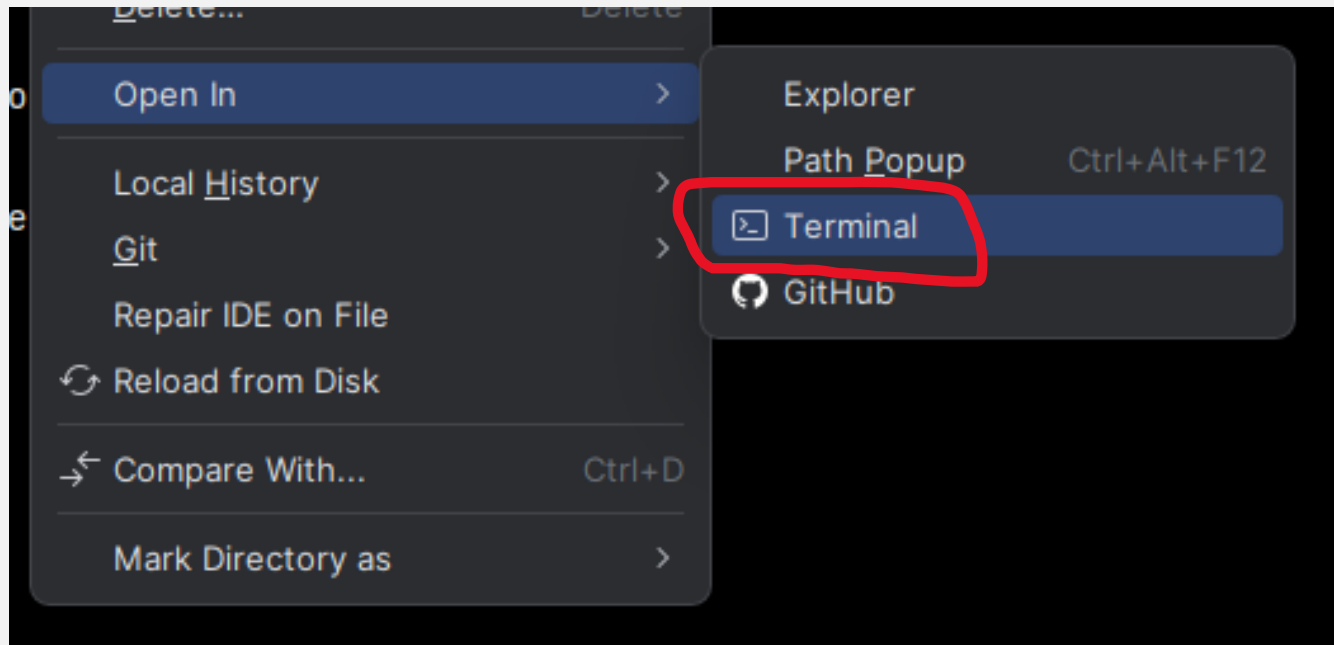
PyCharm: PyInstaller 설치



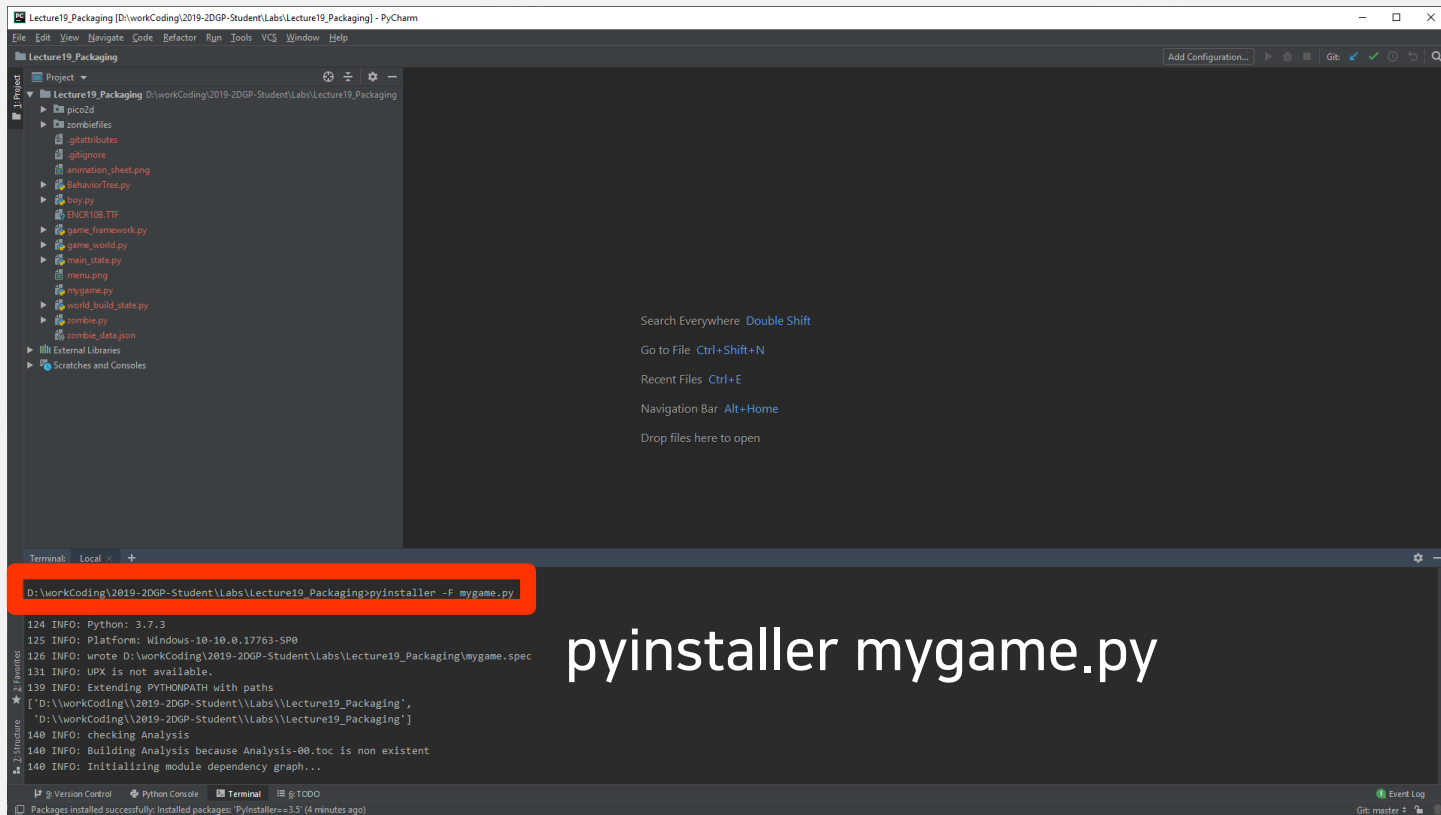
PyCharm: PyInstaller 설치 확인



현재 폴더 터미널 열기



Pyinstaller 실행



The screenshot shows the PyCharm IDE interface. The left sidebar displays the project structure for 'Lecture19_Packaging', which includes files like 'pico2d', 'zombiefiles', 'gitattributes', 'gitignore', 'animation_sheet.png', 'BehaviorTree.py', 'bboy.py', 'ENCR108.TIF', 'game_framework.py', 'game_world.py', 'main_state.py', 'menu.png', 'mygame.py', 'world_build_state.py', 'zombie.py', and 'zombie_data.json'. The main editor area is currently empty, showing a search bar and navigation shortcuts. The bottom terminal window is active, displaying the command `D:\workCoding\2019-2DGP-Student\ Labs\Lecture19_Packaging>pyinstaller -F mygame.py` and its output. The output shows the Python version (3.7.3), platform (Windows-10-0.17763-SP0), and the successful execution of the command, resulting in the installation of PyInstaller==3.5. A red rectangle highlights the command line in the terminal.

```
D:\workCoding\2019-2DGP-Student\ Labs\Lecture19_Packaging>pyinstaller -F mygame.py

124 INFO: Python: 3.7.3
125 INFO: Platform: Windows-10-0.17763-SP0
126 INFO: wrote D:\workCoding\2019-2DGP-Student\ Labs\Lecture19_Packaging\mygame.spec
131 INFO: UPX is not available.
139 INFO: Extending PYTHONPATH with paths
['D:\workCoding\2019-2DGP-Student\ Labs\Lecture19_Packaging',
'D:\workCoding\2019-2DGP-Student\ Labs\Lecture19_Packaging']
140 INFO: checking Analysis
140 INFO: Building Analysis because Analysis-00.toc is non existent
140 INFO: Initializing module dependency graph...
```

pyinstaller mygame.py

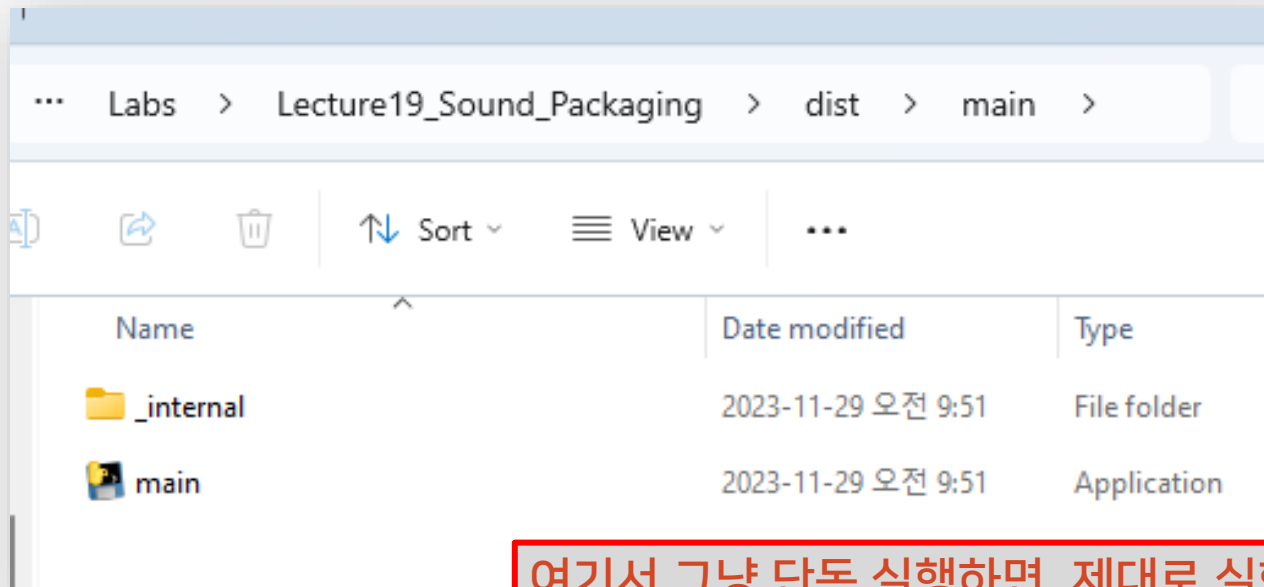
성공 확인

Terminal: Local × +

```
7842 INFO: Building PYZ (ZlibArchive) D:\workCoding\2019-2DGP-Student\Labs\Lecture19_Packaging\build\mygame\PYZ-00.pyz completed successfully.
7855 INFO: checking PKG
7856 INFO: Building PKG because PKG-00.toc is non existent
7856 INFO: Building PKG (CArchive) PKG-00.pkg
10303 INFO: Building PKG (CArchive) PKG-00.pkg completed successfully.
10309 INFO: Bootloader c:\python37\lib\site-packages\PyInstaller\bootloader\Windows-64bit\run.exe
10310 INFO: checking EXE
10310 INFO: Building EXE because EXE-00.toc is non existent
10311 INFO: Building EXE from EXE-00.toc
10312 INFO: Appending archive to EXE D:\workCoding\2019-2DGP-Student\Labs\Lecture19_Packaging\dist\mygame.exe
10399 INFO: Building EXE from EXE-00.toc completed successfully.
```

D:\workCoding\2019-2DGP-Student\Labs\Lecture19_Packaging>

dist/main 폴더에 만들어진, main.exe

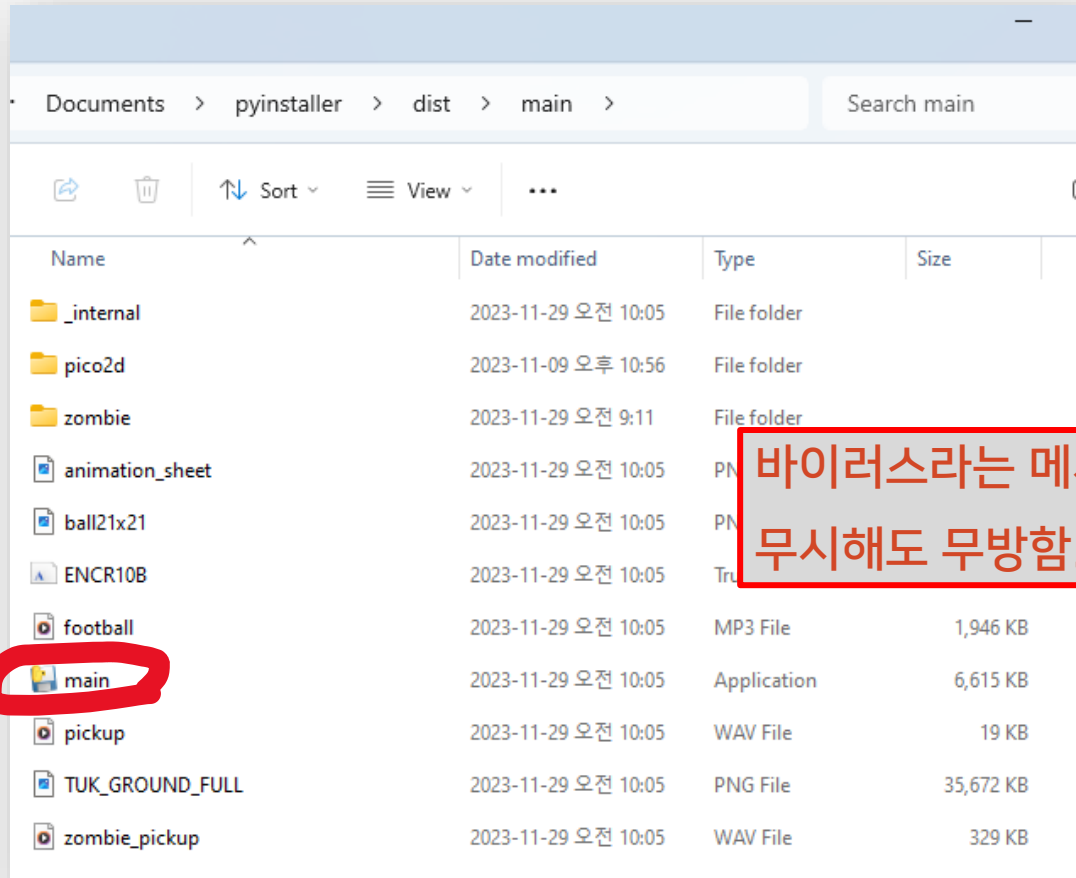


여기서 그냥 단독 실행하면, 제대로 실행이 되지 않음.
main.exe가 필요로 하는 외부 파일을 찾을 수 없기 때문.

리소스 및 필요 DLL 을 dist 폴더로 복사해야 함.

- Pico2d SDL 라이브러리 파일
- 게임에 따라 필요한 리소스 파일
 - 현재 실습 파일의 경우,
 - 폰트 - ENCR10B.TTF
 - 코드 이미지 - futsal_court.png
 - 애니메이션 스프라이트 이미지 - animation_sheet.png
 - 사운드 파일 - sound 폴더 안의 football.mp3, pickup.wav

dist 폴더: 여기서 main.exe 을 클릭하면 실행!



바이러스라는 메시지가 나올 수 있음. !!!!
무시해도 무방함.

spec 파일의 이용

```
# -*- mode: python ; coding: utf-8 -*-
import os
import pico2d

sdl2dll_path = os.getenv('PYSDL2_DLL_PATH')

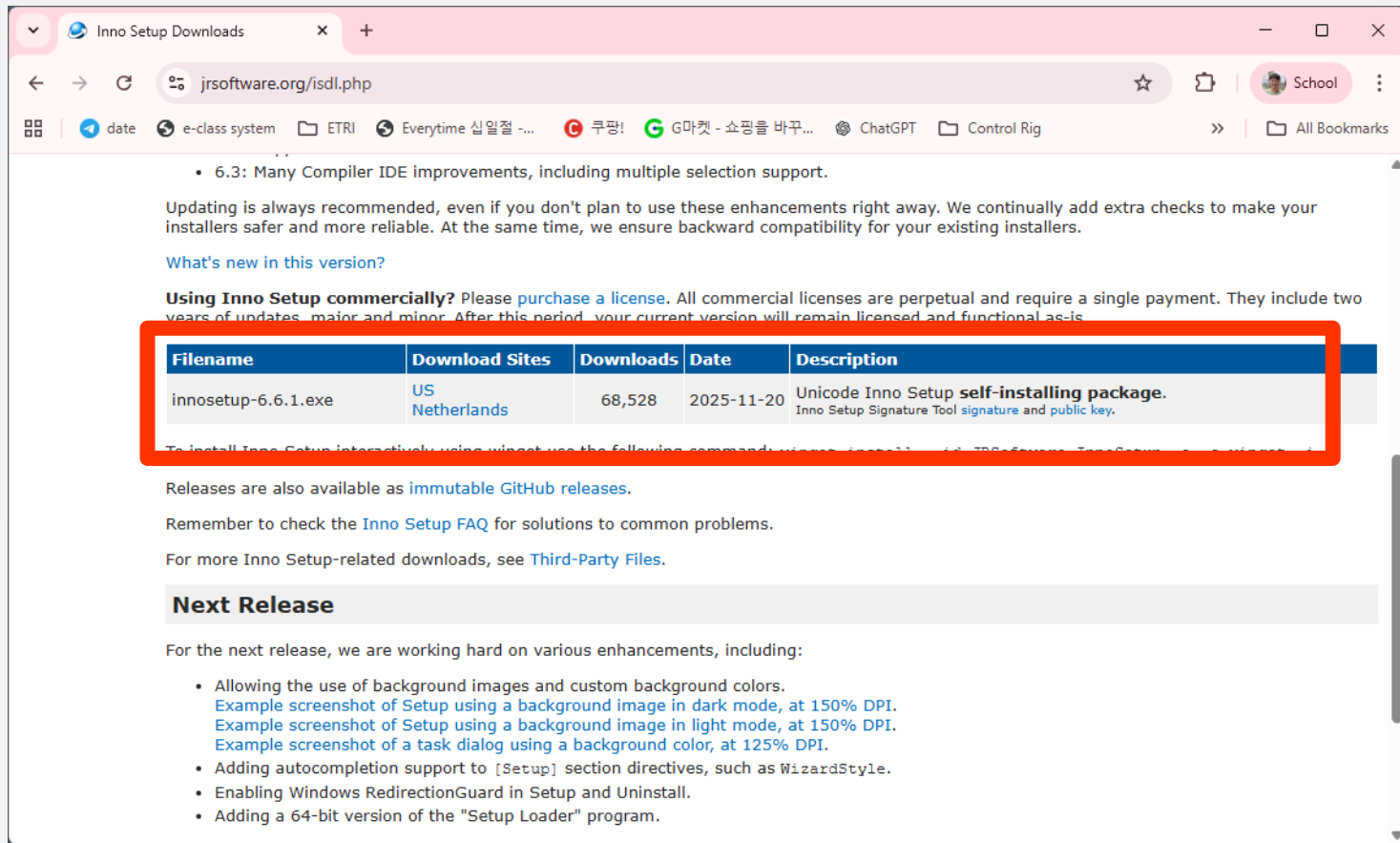
a = Analysis(
    ['mygame.py'], # <===== 1. 메인 소스 파일을 지정해야 합니다.
    pathex=[],
    binaries=[(os.path.join(sdl2dll_path, '*.dll'), '.')],
    datas=[],
    hiddenimports=[],
    hookspath=[],
    hooksconfig={},
    runtime_hooks=[],
    excludes=[],
    noarchive=False,
    optimize=0,
)
pyz = PYZ(a.pure)
```

```
exe = EXE(
    pyz,
    a.scripts,
    a.binaries,
    a.datas,
    [],
    name='mygame', # <===== 2. 생성될 실행 파일 이름을 지정해야 합니다.
    debug=False,
    bootloader_ignore_signals=False,
    strip=False,
    upx=True,
    upx_exclude=[],
    runtime_tmpdir=None,
    console=False, # <===== 3. 문제가 발생했을 때 True 로 해서 확인.
    disable_windowed_traceback=False,
    argv_emulation=False,
    target_arch=None,
    codesign_identity=None,
    entitlements_file=None,
)
```




Installer를 이용한
설치 파일 제작

Inno Setup 의 설치



6.3: Many Compiler IDE improvements, including multiple selection support.

Updating is always recommended, even if you don't plan to use these enhancements right away. We continually add extra checks to make your installers safer and more reliable. At the same time, we ensure backward compatibility for your existing installers.

[What's new in this version?](#)

Using Inno Setup commercially? Please [purchase a license](#). All commercial licenses are perpetual and require a single payment. They include two years of updates, major and minor. After this period, your current version will remain licensed and functional as-is.

Filename	Download Sites	Downloads	Date	Description
innosetup-6.6.1.exe	US Netherlands	68,528	2025-11-20	Unicode Inno Setup self-installing package . Inno Setup Signature Tool signature and public key .

To install Inno Setup interactively using winget use the following command: `winget install -s=JRSoftware InnoSetup`

Releases are also available as [immutable GitHub releases](#).

Remember to check the [Inno Setup FAQ](#) for solutions to common problems.

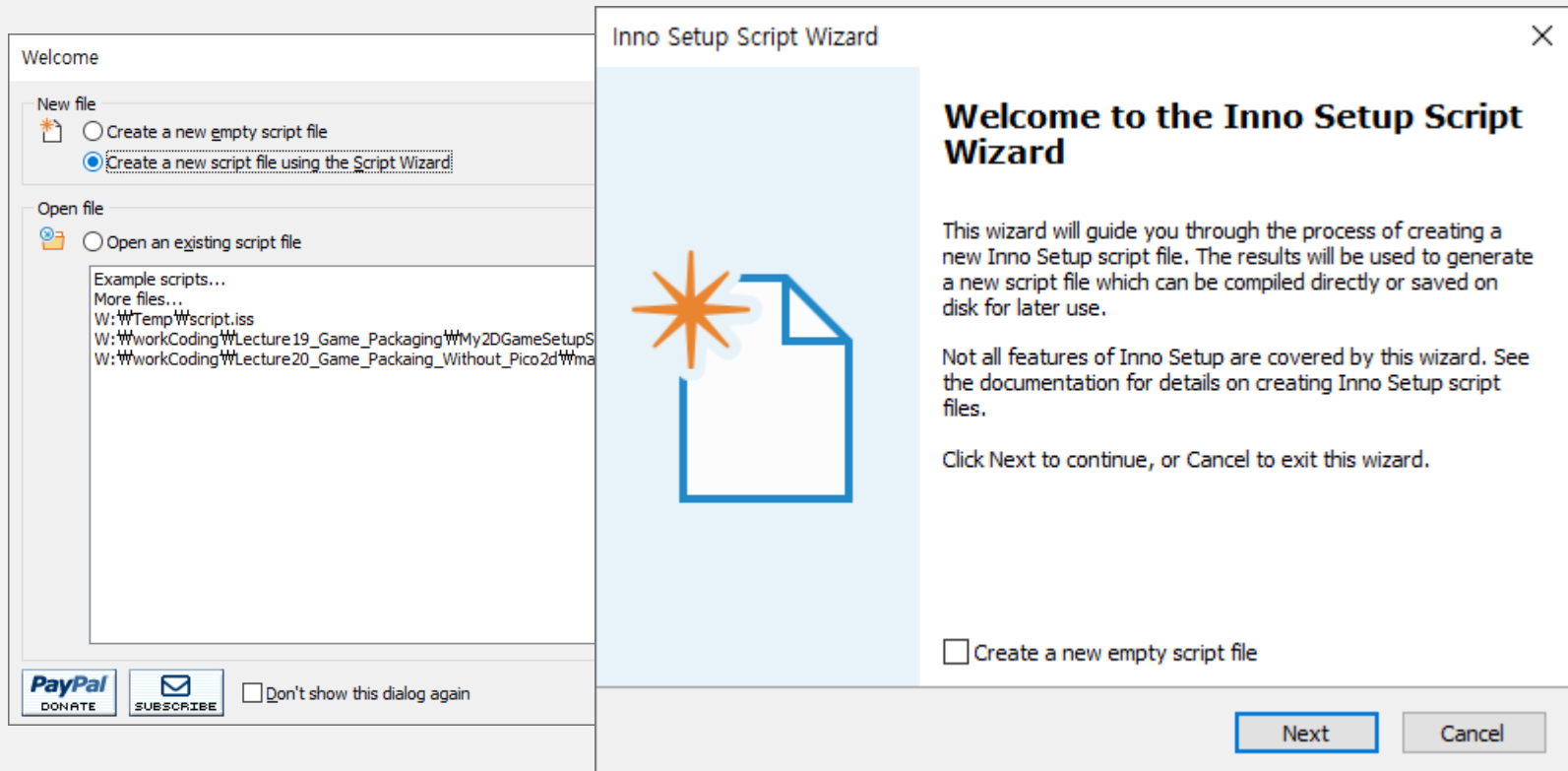
For more Inno Setup-related downloads, see [Third-Party Files](#).

Next Release

For the next release, we are working hard on various enhancements, including:

- Allowing the use of background images and custom background colors.
[Example screenshot of Setup using a background image in dark mode, at 150% DPI.](#)
[Example screenshot of Setup using a background image in light mode, at 150% DPI.](#)
[Example screenshot of a task dialog using a background color, at 125% DPI.](#)
- Adding autocompletion support to [Setup] section directives, such as `WizardStyle`.
- Enabling Windows RedirectionGuard in Setup and Uninstall.
- Adding a 64-bit version of the "Setup Loader" program.

실행: File->New



Inno Setup Script Wizard

Application Information
Please specify some basic information about your application.

Application name:
MyGame

Application version:
1.5

Application publisher:
My Company, Inc.

Application website:
<https://www.example.com/>

bold = required

Inno Setup Script Wizard

Application Folder
Please specify folder information about your application.

Application destination base folder:
Program Files folder

Application folder name:
MyGame

☒ Allow user to change the application folder

☐ The application doesn't need a folder

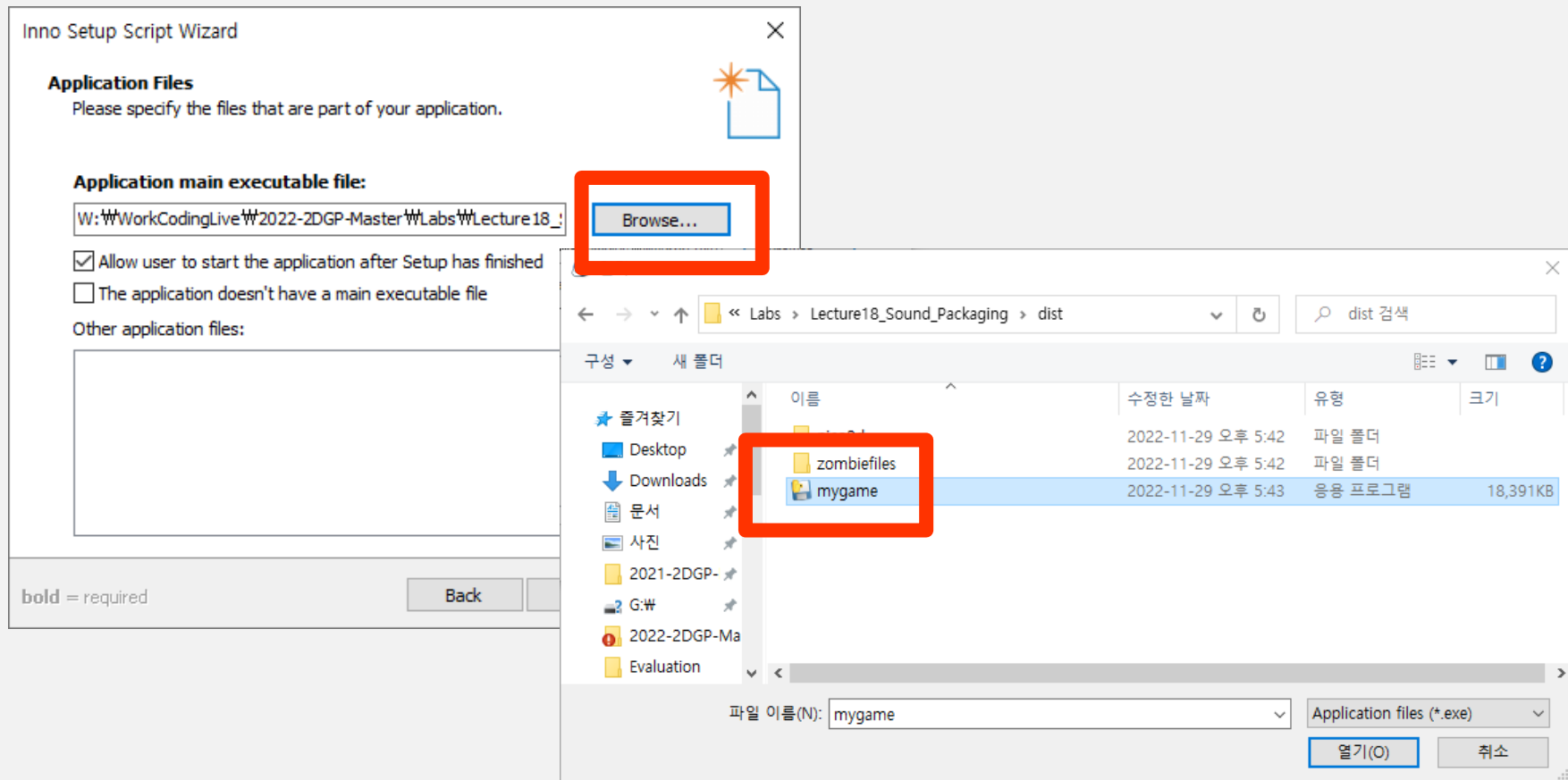
bold = required

Back Next Cancel

프로그램이 설치될 폴더.

프로젝트 발표를 위해서, 학번으로 구별하는 것이 좋음.

실행 파일 추가



파일 폴더 추가

Inno Setup Script Wizard

Application Files
Please specify the files that are part of your application.

Application main executable file:
W:\WorkCodingLive\2022-2DGP-Master\Labs\Lecture18_... Browse...

☒ Allow user to start the application after Setup has finished
☐ The application doesn't have a main executable file

Other application files:
W:\WorkCodingLive\2022-2DGP-Master\Labs\Lecture18_...
Add file(s)
Add folder...
Edit...
Remove

Back Next Cancel

bold = required

Confirm

? Should files in subfolders of "W:\WorkCodingLive\2022-2DGP-Master\Labs\Lecture18_Sound_Packaging\dist" also be included?

예(Y) 아니요(N) 취소

Inno Setup Script Wizard

Application File Association

Please specify which file association should be created for your application.

☐ Associate a file type

Application file type name:

MyGame File

Application file type extension:

.myp

bold = required

Inno Setup Script Wizard

Application Shortcuts

Please specify which shortcuts should be created

☒ Create a shortcut to the main executable in the Start Menu

Application Start Menu folder name:

MyGame

☒ Allow user to change the Start Menu folder name

☐ Allow user to disable Start Menu folder creation

☐ Create an Internet shortcut in the Start Menu

☐ Create an Uninstall shortcut in the Start Menu

Other shortcuts to the main executable:

☒ Allow user to create a desktop shortcut

bold = required

Back

Next

Cancel

Inno Setup Script Wizard

Application Documentation

Please specify which documentation files should be shown by Setup during installation.

License file:

Browse...

Information file shown before installation:

Browse...

Information file shown after installation:

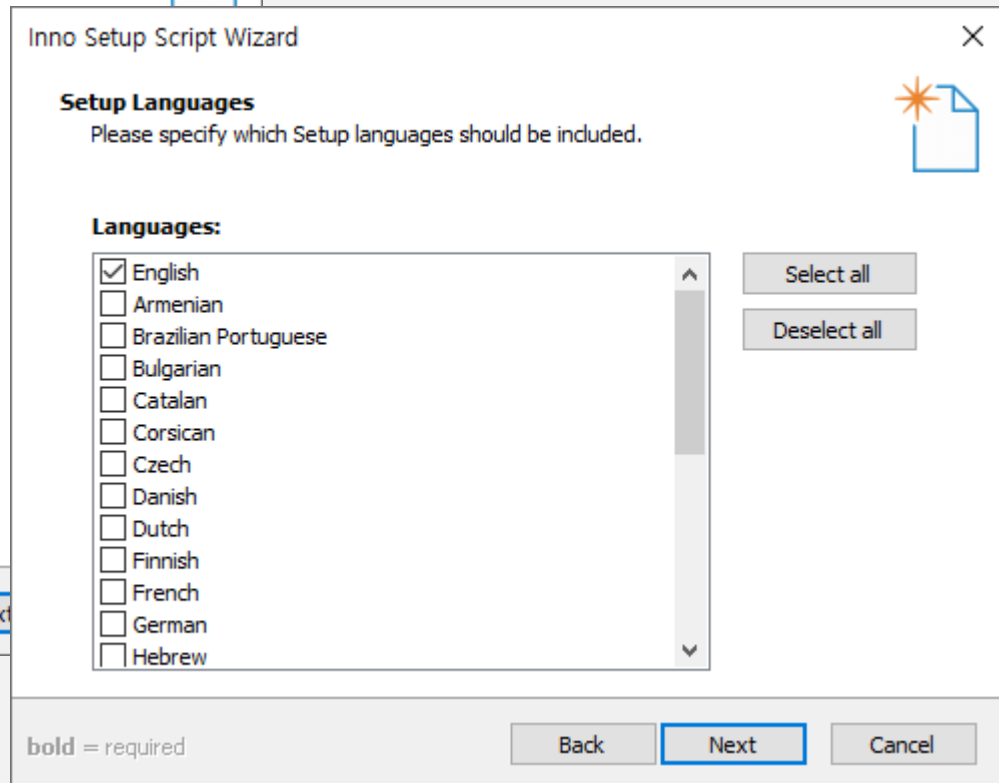
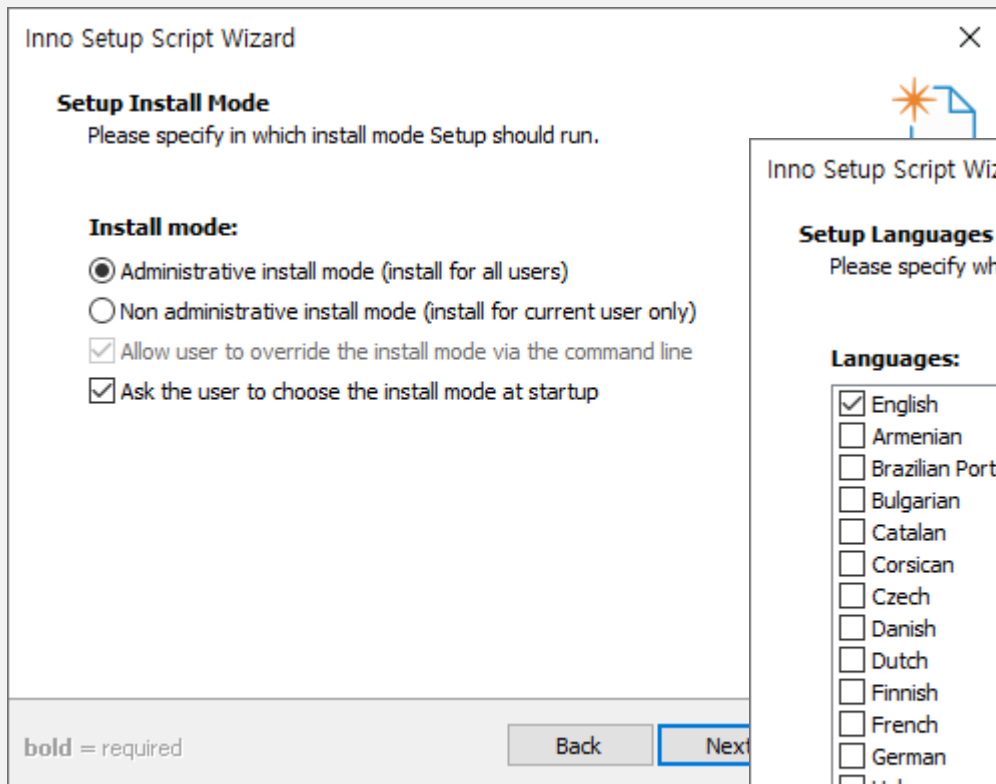
Browse...

Back

Next

Cancel





Inno Setup Script Wizard

Compiler Settings

Please specify some basic compiler settings.

Custom compiler output folder:

Compiler output base file name:

Custom Setup icon file:

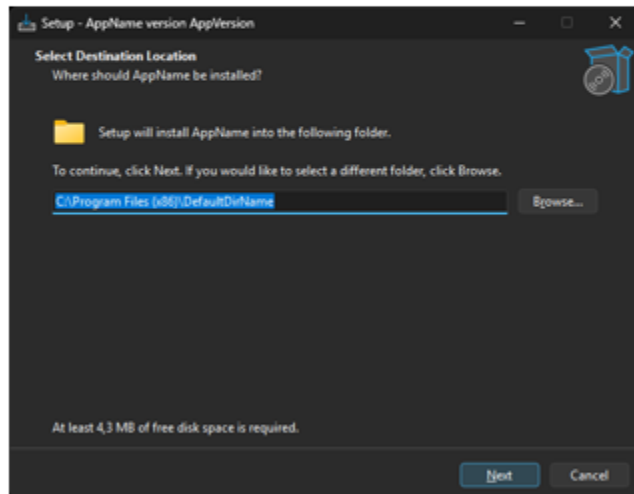
Setup password:

Inno Setup Script Wizard

Wizard Style

Please specify which wizard style should be used.

Wizard style:



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Next

Cancel

Inno Setup Script Wizard



Inno Setup Preprocessor

Please specify whether Inno Setup Preprocessor should be used.



The Inno Setup Script Wizard can use #define compiler directives to simplify your script. Although this is not necessary, it will make it easier to manually change the script later.

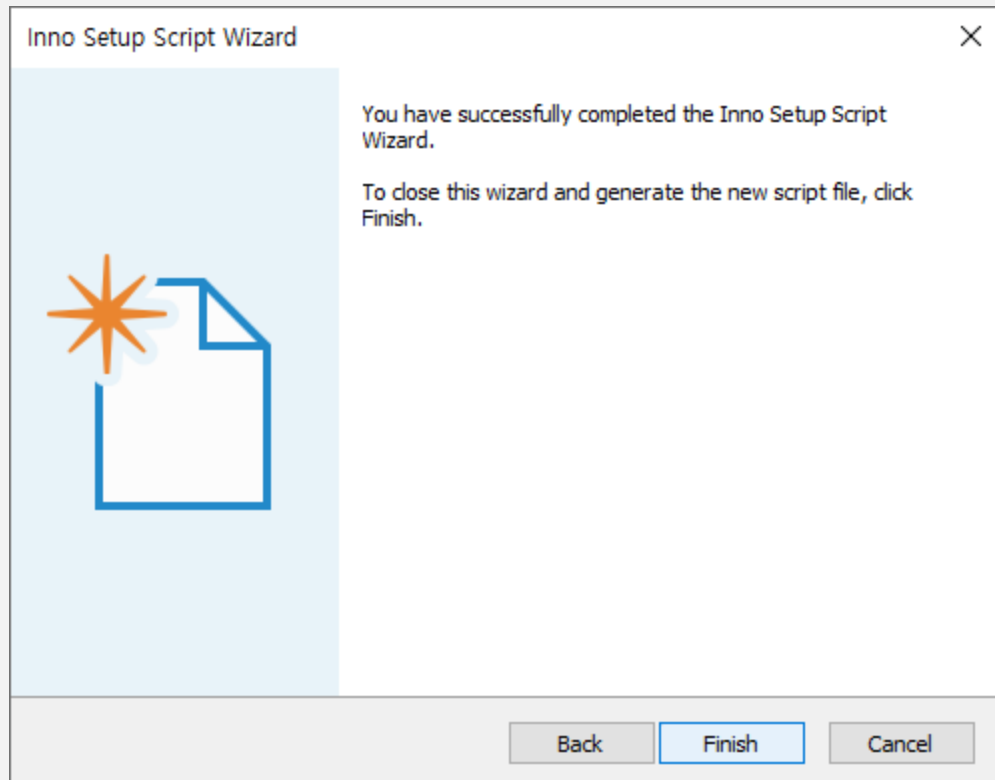
Do you want the Inno Setup Script Wizard to use #define compiler directives?

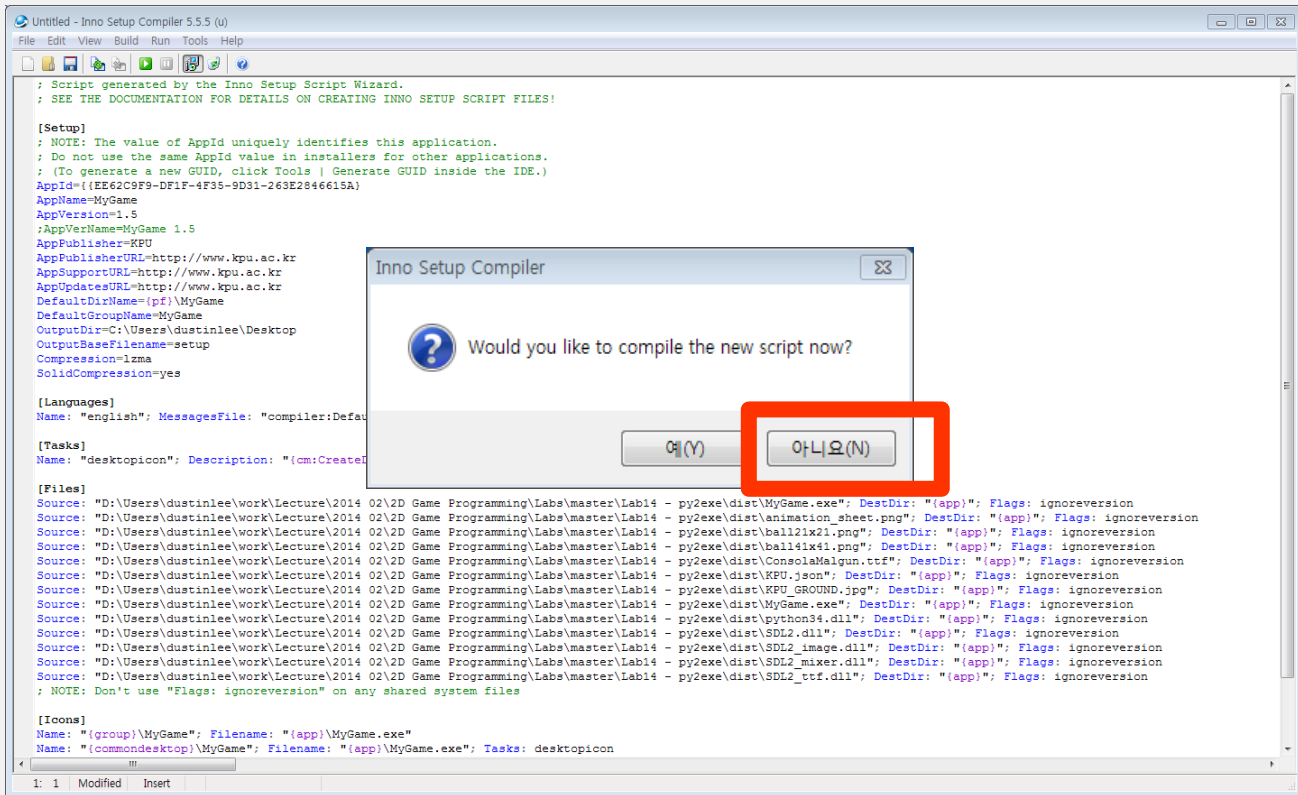
☒ Yes, use #define compiler directives

Back

Next

Cancel





```
test - Inno Setup Compiler 5.6.1 (u)
File Edit View Build Run Tools Help

[Files]
Source: "D:\workCoding\2DGP-Master\Labs\Lecture18\dist\mygame.exe"; DestDir: "{app}"; F1
Source: "D:\workCoding\2DGP-Master\Labs\Lecture18\dist\*"; DestDir: "{app}"; Permissions
; NOTE: Don't use "Flags: ignoreversion" on any shared system files

[Icons]
Name: "{commonprograms}\My Program"; Filename: "{app}\mygame.exe"
Name: "{commondesktop}\My Program"; Filename: "{app}\mygame.exe"

[Run]
Filename: "{app}\mygame.exe"; Description: "My Game"

[Dirs]
Name: {app}; Permissions: users-full

Compressing: D:\workCoding\2DGP-Master\Labs\Lecture18\dist\Wzomies\wmaile\wvaik (9).png
Compressing: D:\workCoding\2DGP-Master\Labs\Lecture18\dist\Wzomies\wmaile\wvaik (9).png
Compressing: D:\workCoding\2DGP-Master\Labs\Lecture18\dist\Wzomies\wmaile\wvaik (9).png
Compressing: D:\workCoding\2DGP-Master\Labs\Lecture18\dist\Wzomies\wmaile\wvaik (9).png
Compressing Setup program executable
Updating version info

Warning: Setting the [Setup] section "OutputBaseFileName" to "setup" is not recommended. all executables named "setup.exe" are shimmed by Windows

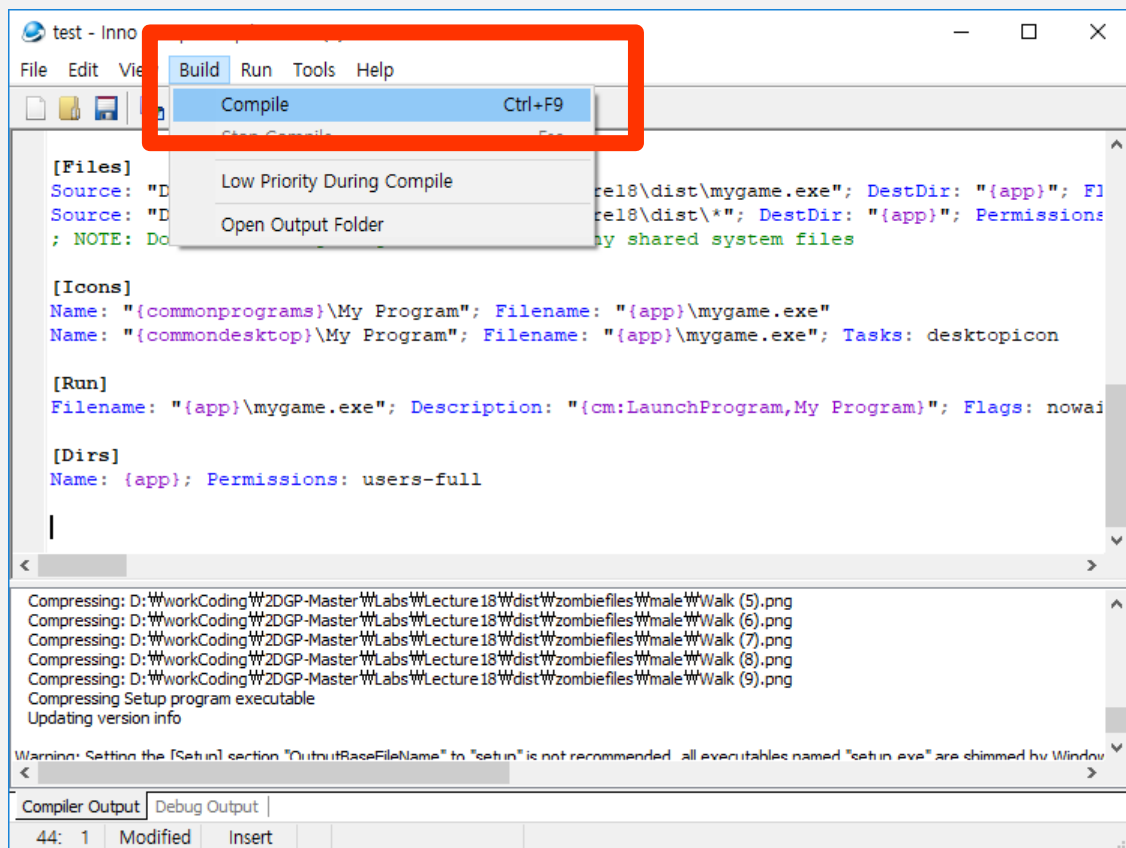
Compiler Output | Debug Output |
44: 1 | Modified | Insert
```

mygame 폴더에 데이터 파일을 써야 하는 경우가 있을 수 있음.

하지만, 폴더가 Program Files 로써 시스템 폴더이기 때문에,
일반적으로 애플리케이션에서 저장이 불가능.

따라서, 해당 폴더의 permission 을 강제로 풀어야 함.

추천할 만한 방법은 아니며, 사용자 데이터는 사용자의 개별 폴더에
저장할 수 있게 하는 것이 바람직함.



생성된 셋업 파일

