게임 엔진

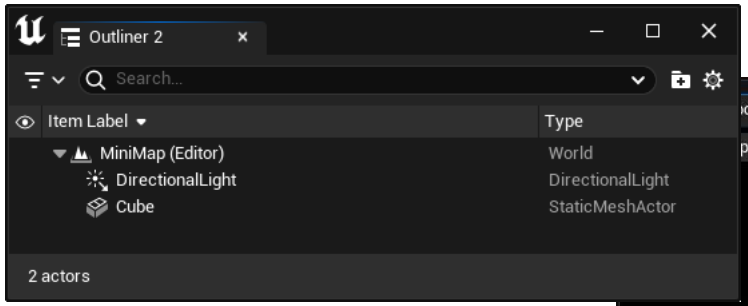
LEC 07 게임플레이 프레임워크

한국공학대학교 TECH UNIVERSITY OF KOREA 이대현 교수

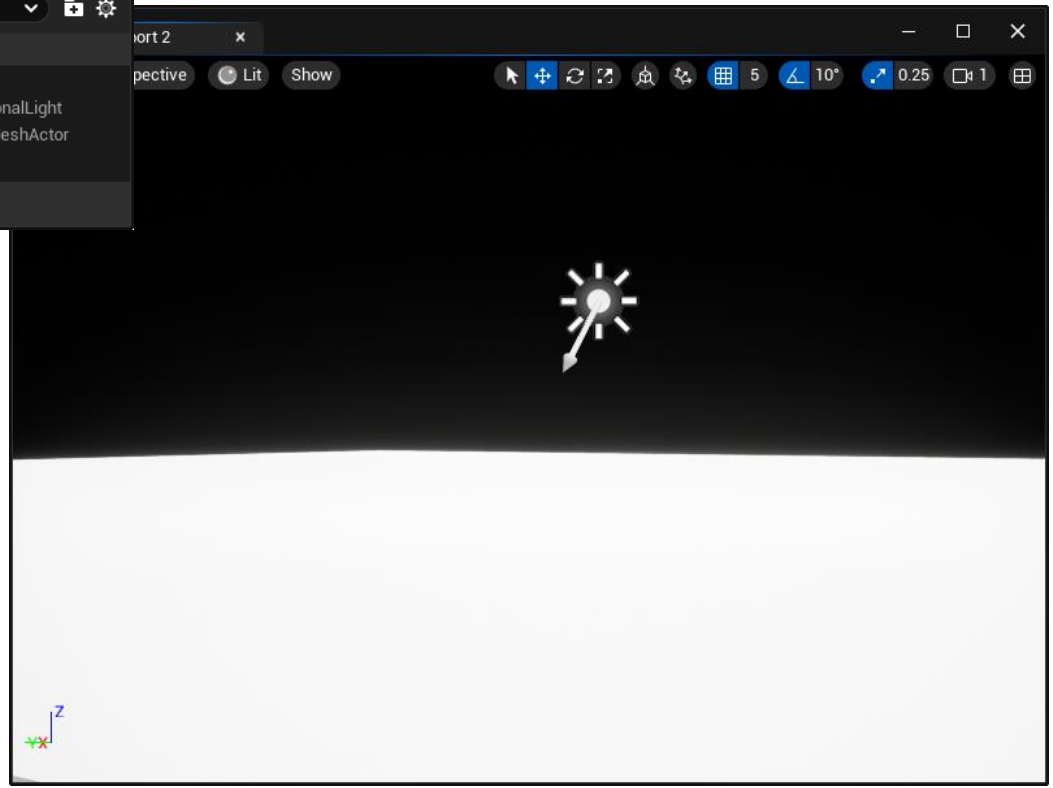
목차

- 게임 플레이 프레임워크
- Default Pawn 클래스
- Aircraft 조종 실습

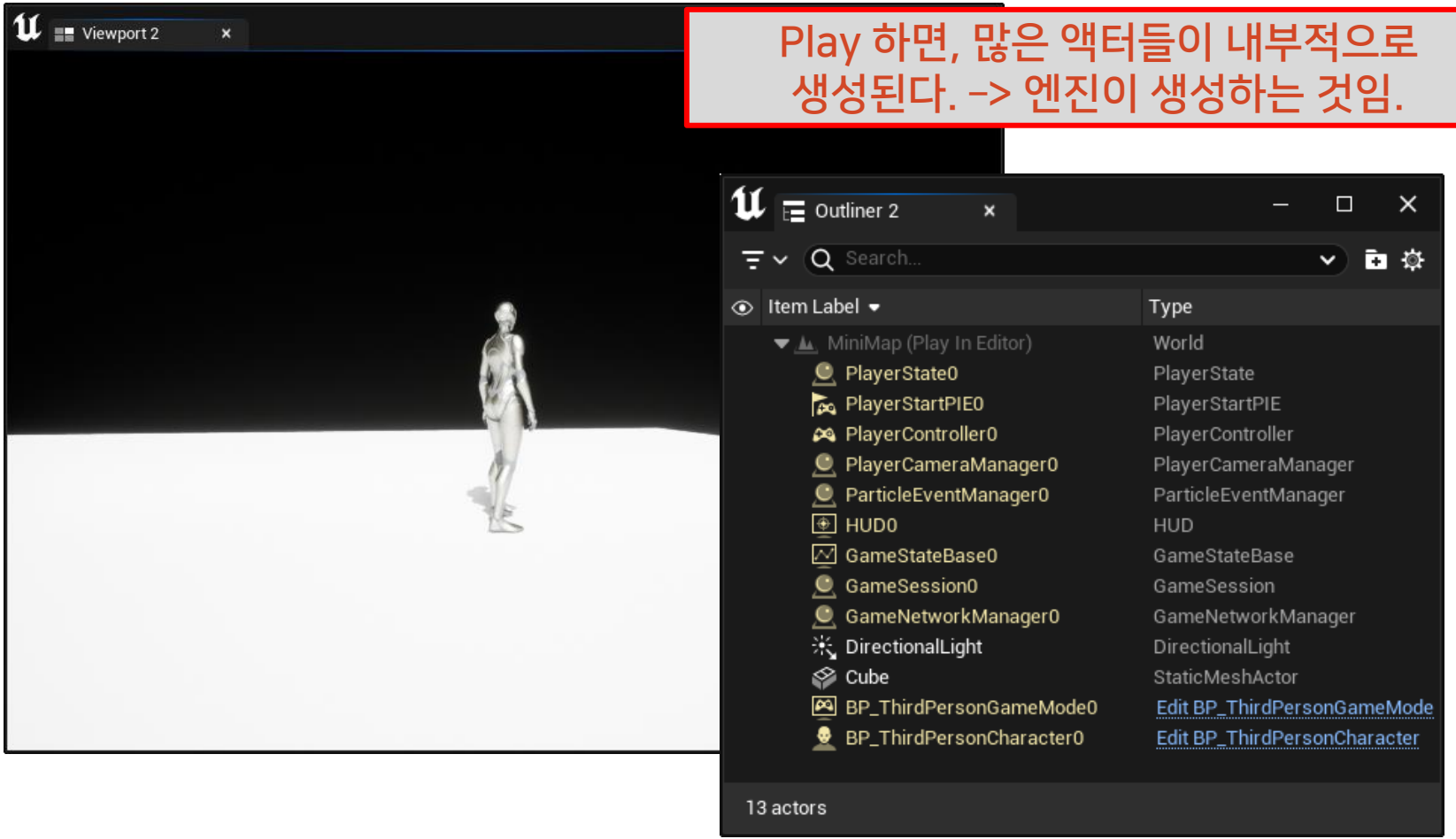
MiniMap



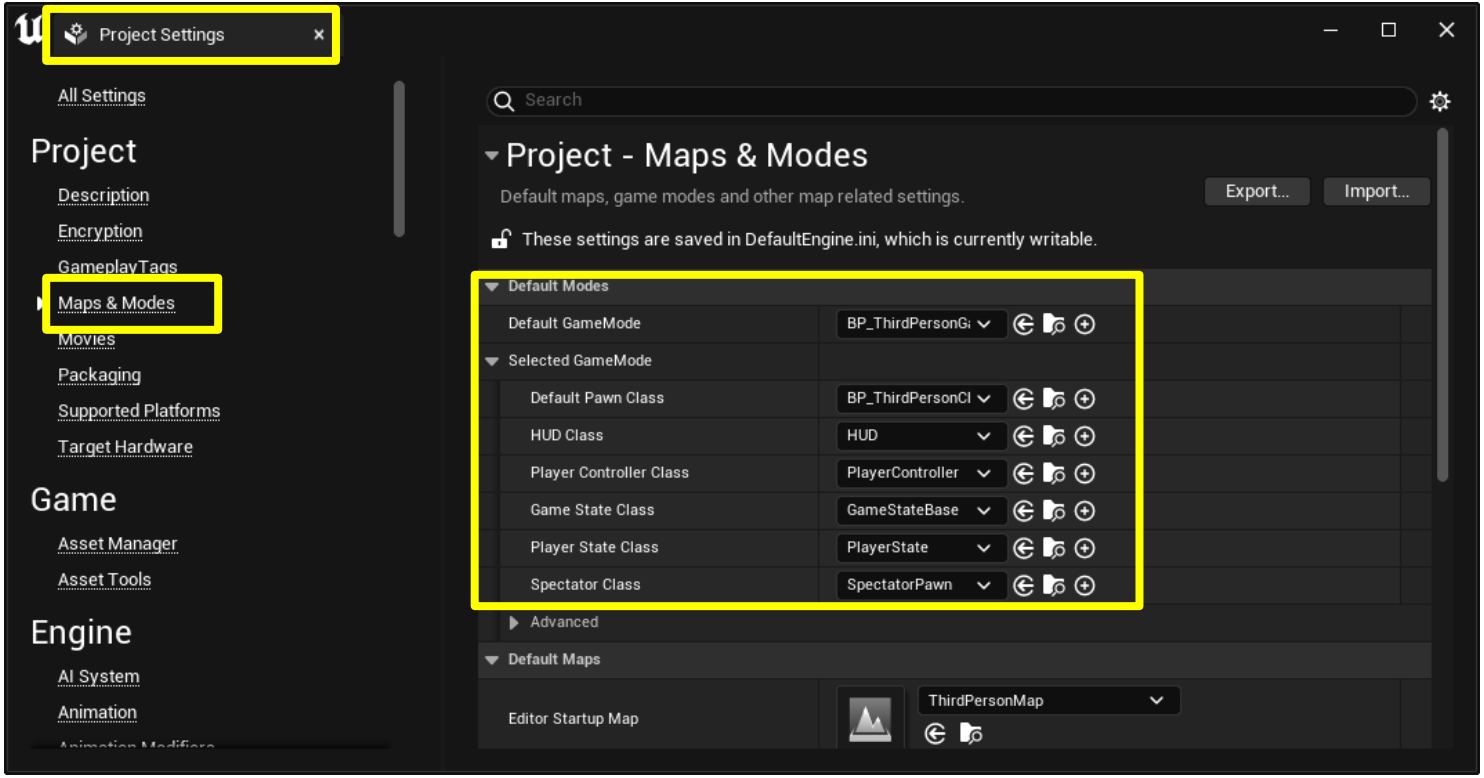
단 두 개의 액터로만 구성된 레벨



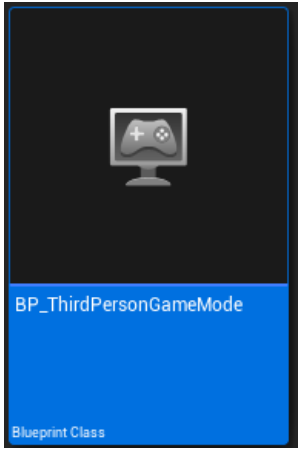
Play 하면, 많은 액터들이 내부적으로 생성된다. -> 엔진이 생성하는 것임.



Third Person 샘플 프로젝트의 게임 모드

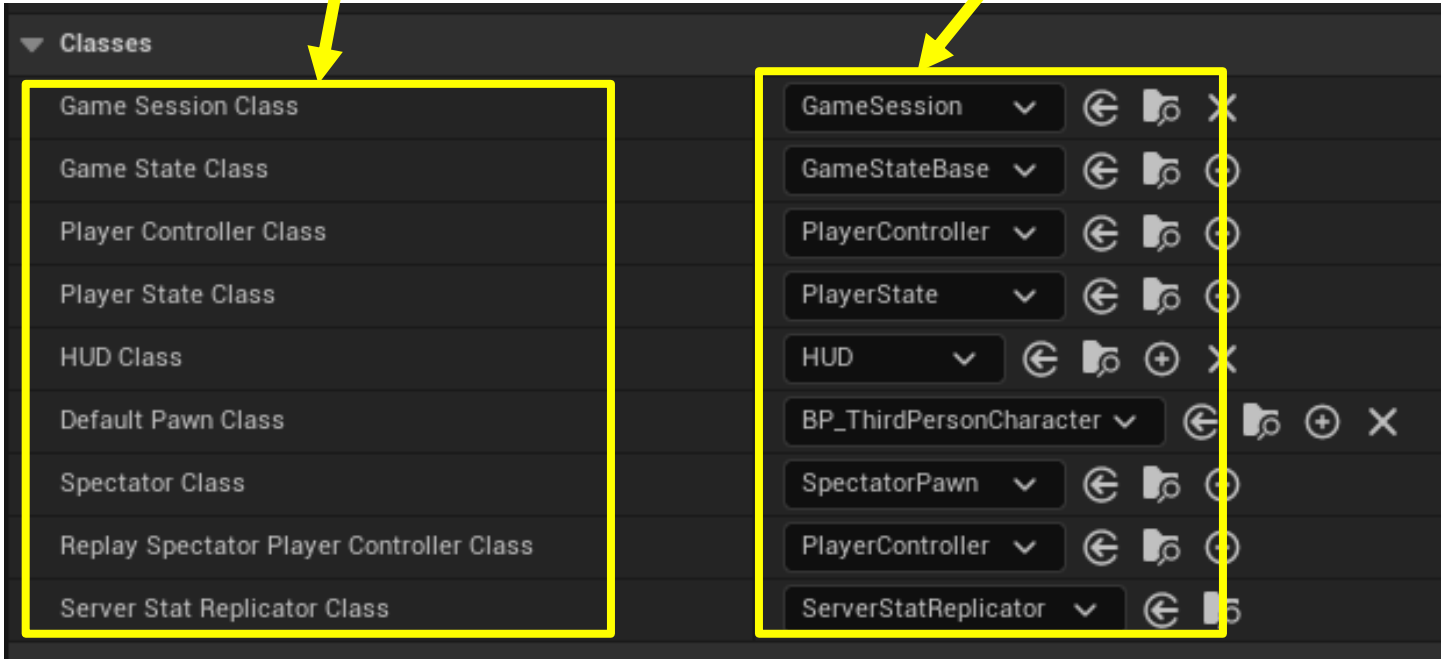


게임 모드 – 게임 실행 시 요구되는 클래스를 지정



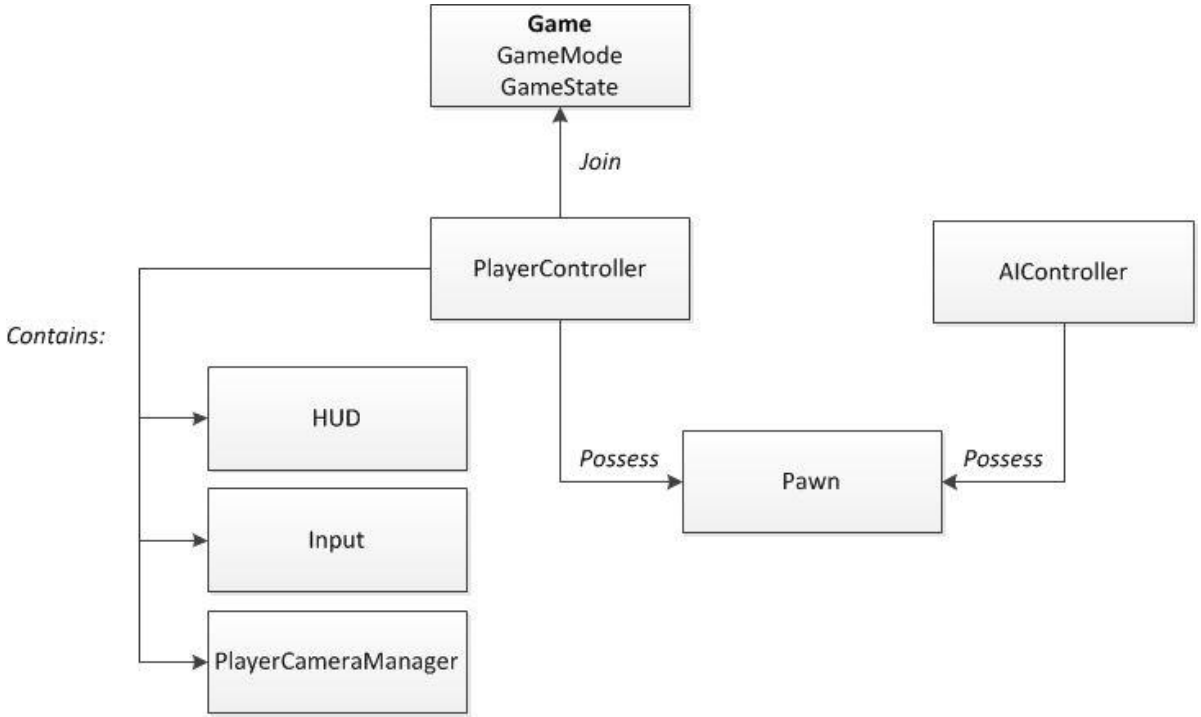
게임 실행에 필요한 클래스의 종류

실제 지정된 클래스



게임 플레이 프레임워크

- 언리얼 엔진에 게임 실행에 필수적인 객체들의 집합과 그 연관 구조
  - 폰
  - 컨트롤러
  - 카메라
  - HUD
  - 입력
  - 게임 모드



Gameplay Framework의 Object Diagram

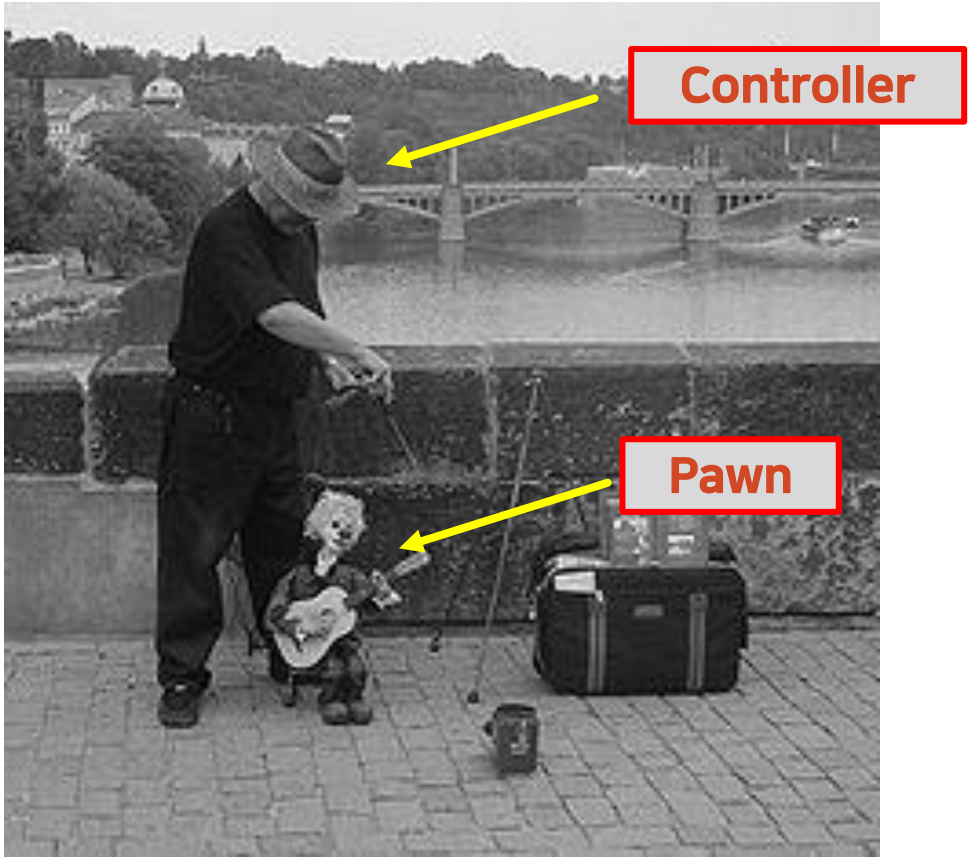
Pawn

- 플레이어 혹은 NPC 와 같은 객체를 통칭함.
- 모든 게임 (Live) 객체들의 베이스 클래스.
  - Q: 모든 객체들의 베이스 클래스는??
- 객체의 시각적, 물리적 표현을 담당.
- 객체들의 (비시각적,비물리적) 상태는?
  - Player : PlayerState 에 저장.
  - NPC: AIController 에 저장.

http://api.unrealengine.com/KOR/Gameplay/Framework/Pawn/index.html

Controller

- Pawn 을 지배하는 조종하는 액터
- 언리얼 엔진 만의 독특한 캐릭터 제어 방식
  - Body 와 Brain 을 분리

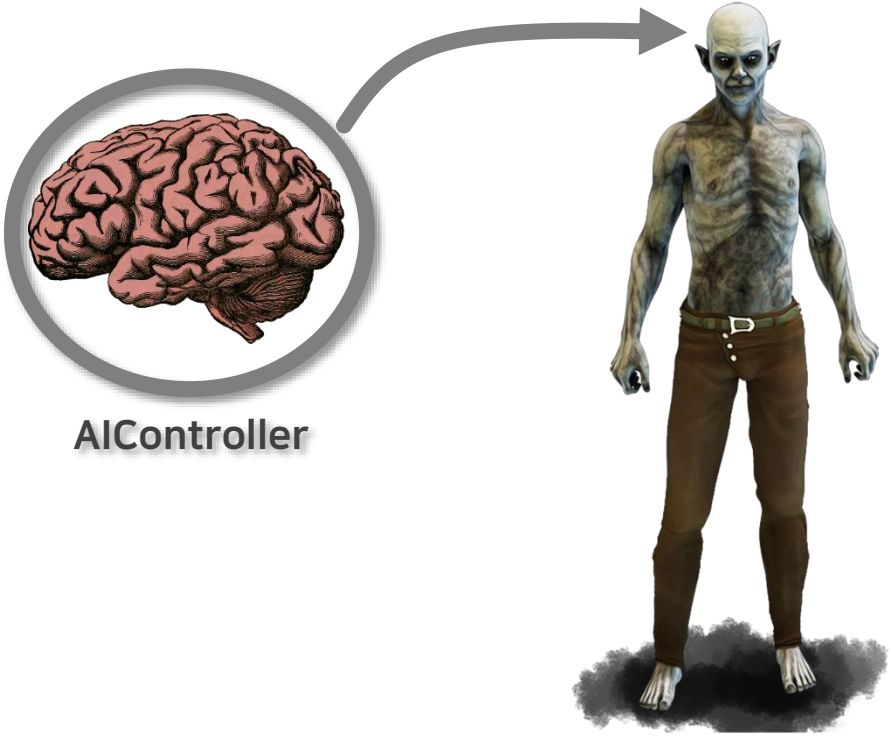


PlayerController

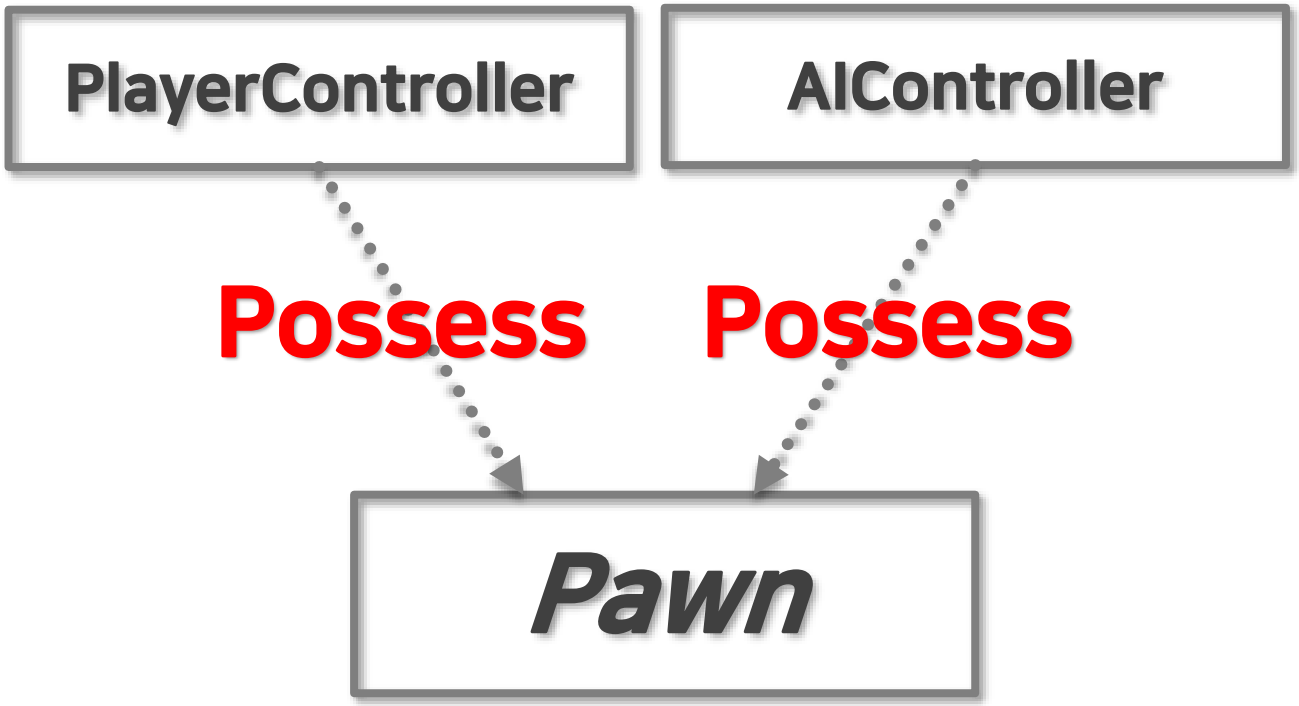
- 게임 플레이어와 게임 월드를 연결시키는 Controller
- Pawn 뿐만 아니라, 카메라, HUD 도 제어.

AIController

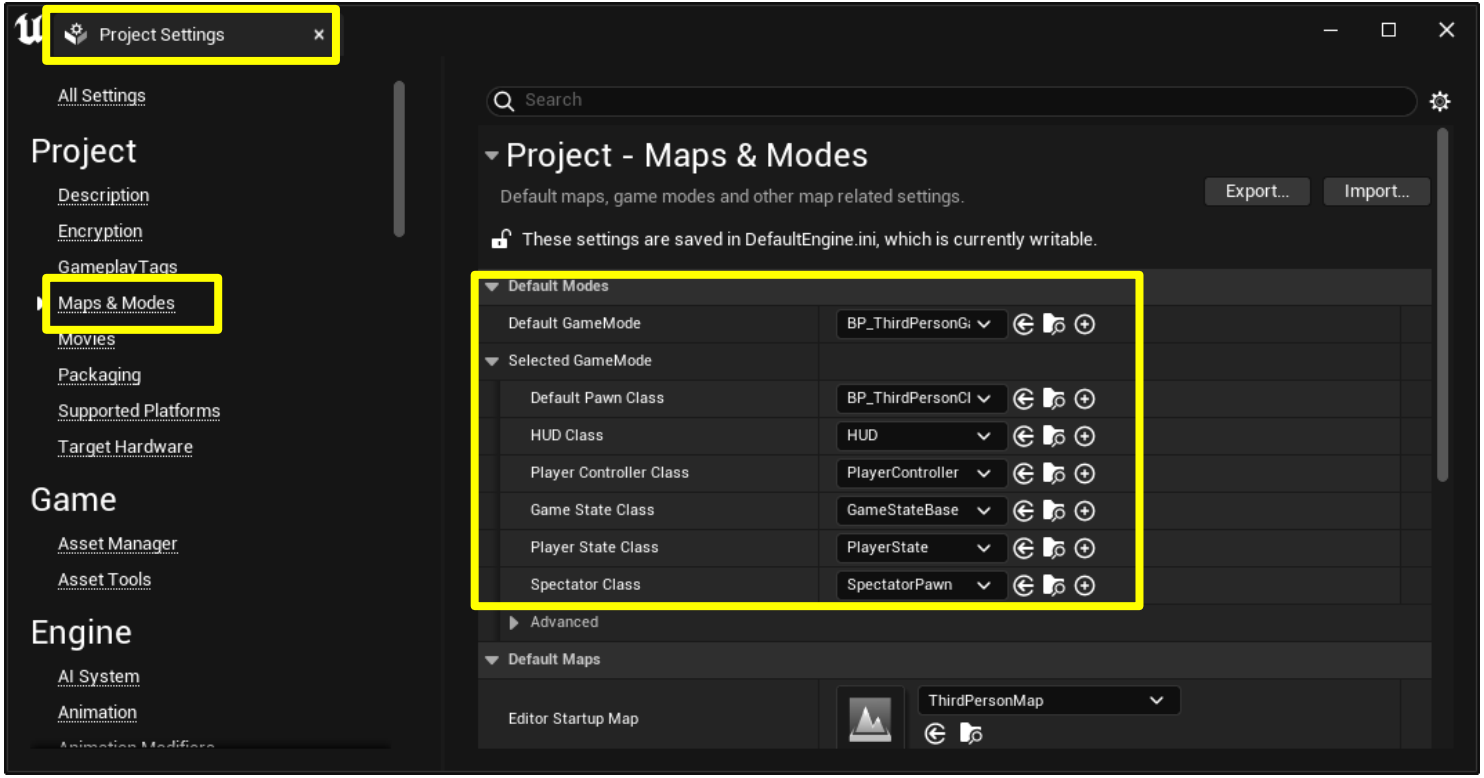
- NPC 를 제어하는 인공지능 컨트롤러



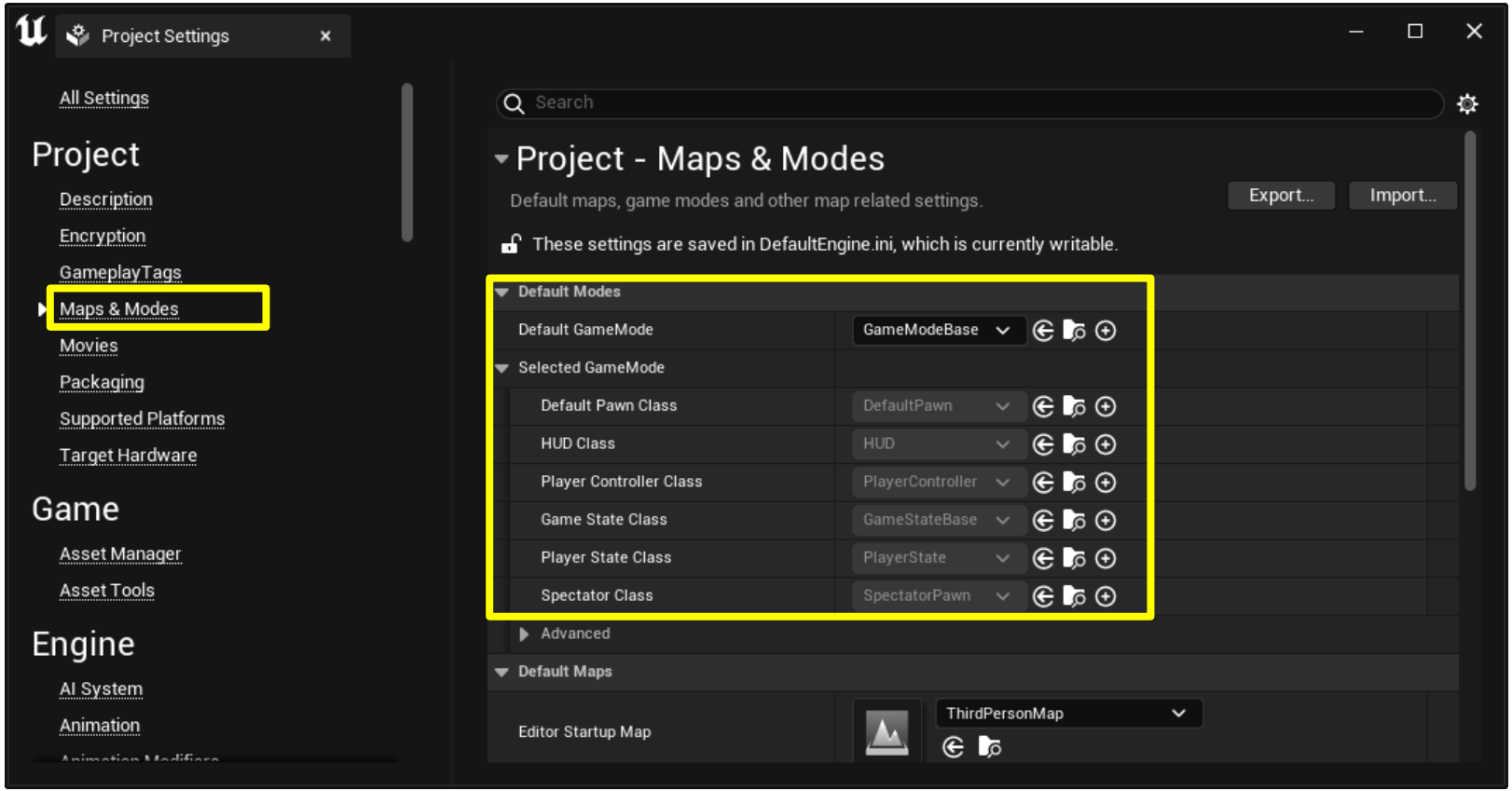
게임 플레이 프레임워크 핵심 구조 – 지배(Possess) 구조

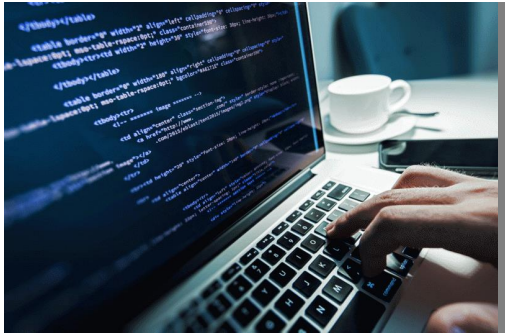


BP_ThirdPersonGameMode



GameModeBase – 가장 기본이 되는 게임 모드

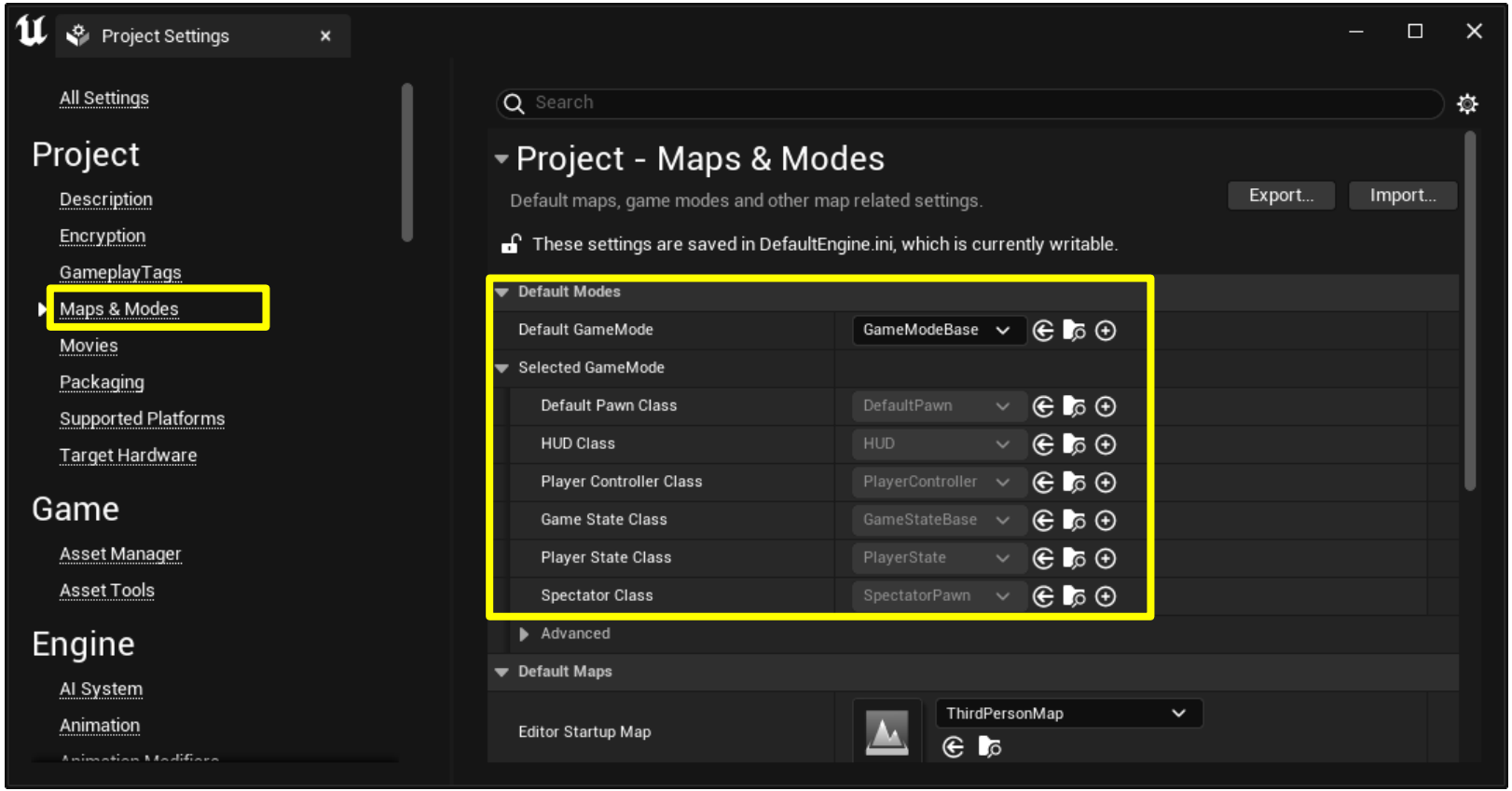


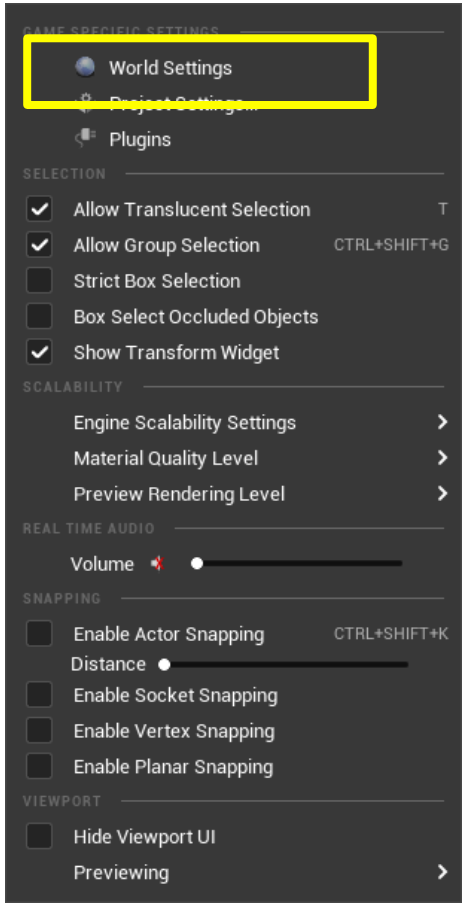


실습 LAB

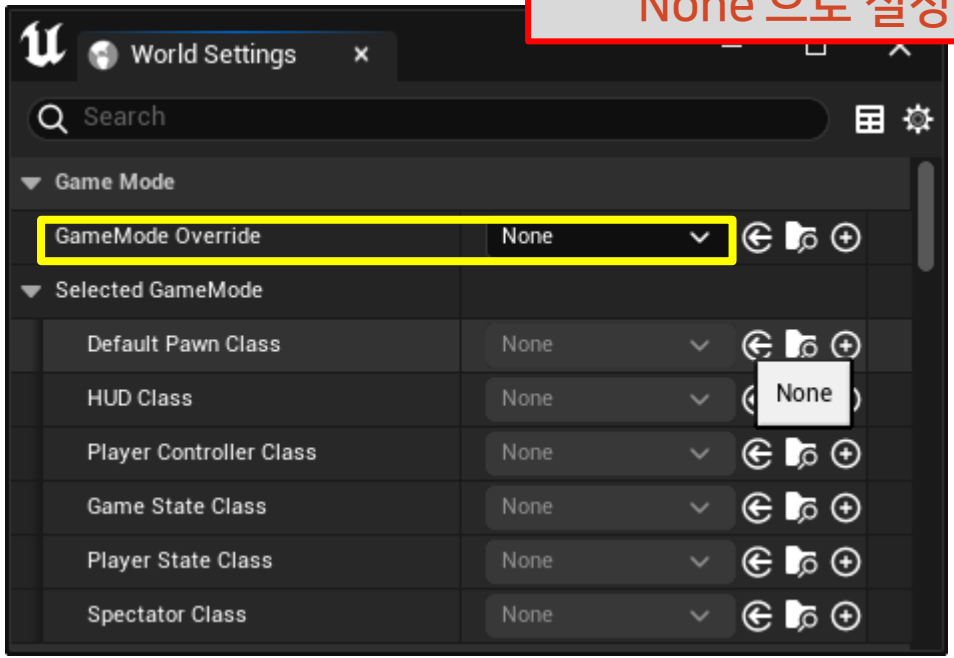
게임 모드 구성 실습

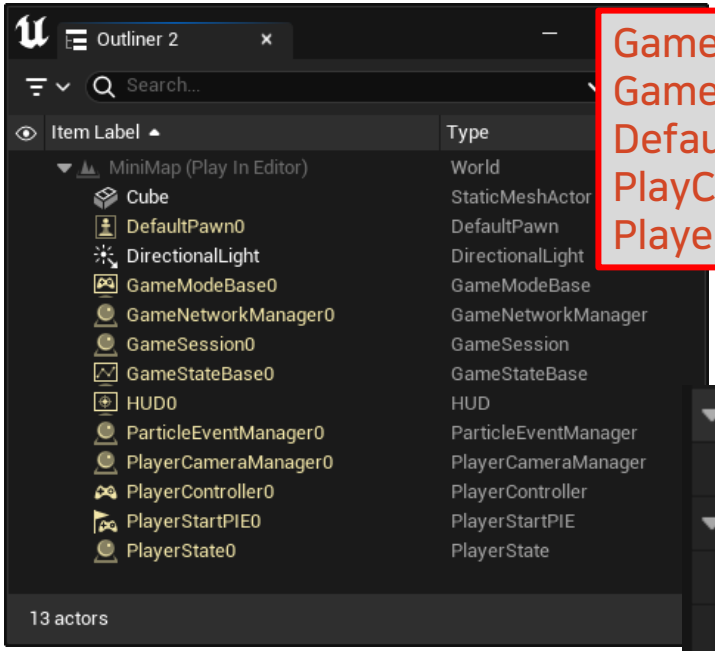
Project의 기본 게임 모드 확인 - GameModeBase



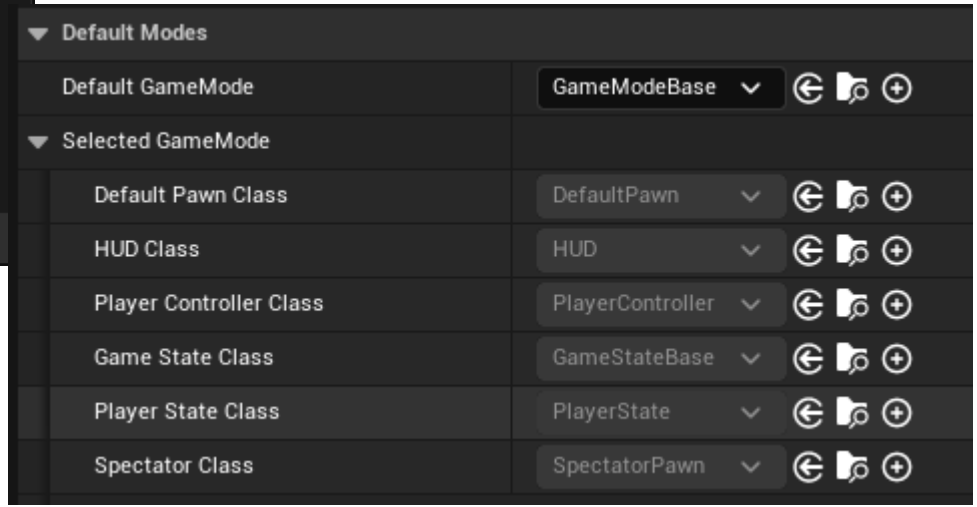


World Settings 의
GameMode 확인
'None'으로 설정

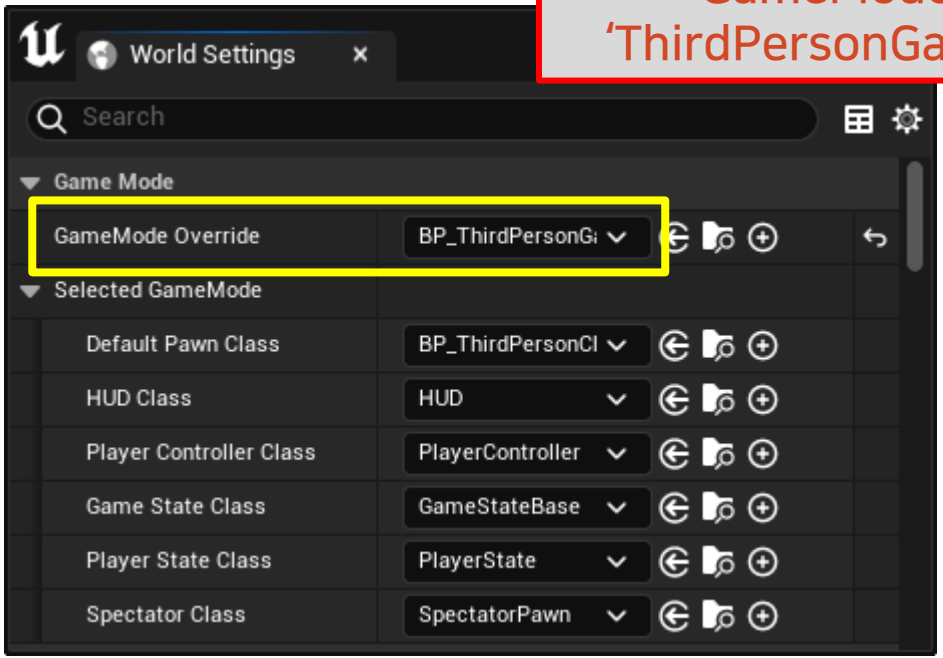


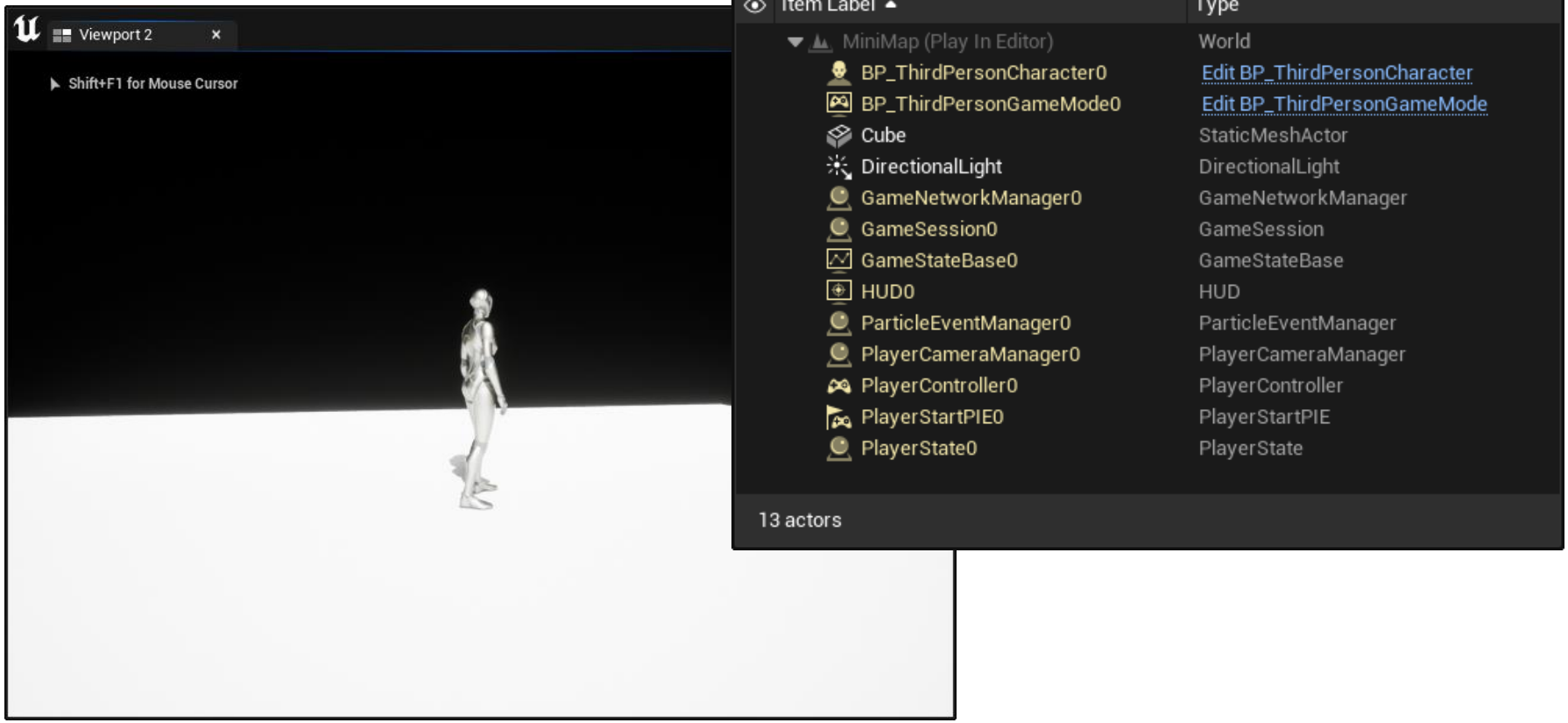


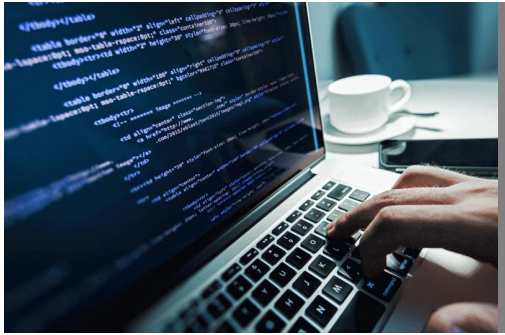
GameModeBase 액터가 생성됨.
GameModeBase에서 지정한 클래스를 이용하여, 각종 액터들이 생성됨.
DefaultPawn이 생성됨.
PlayController 는 PlayerCameraManager를 갖게 됨.
PlayerCameraManager는 자동생성된 CameraActor를 갖게 됨.



GameMode Override 를
‘ThirdPersonGameMode’로 설정.



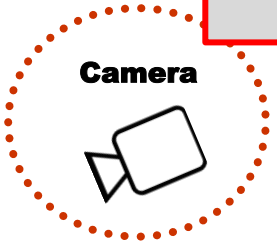

Viewport 2
Shift+F1 for Mouse Cursor
Outliner 2
Search...
Item Label
Type
MiniMap (Play In Editor)
World
BP_ThirdPersonCharacter0
Edit BP_ThirdPersonCharacter
BP_ThirdPersonGameMode0
Edit BP_ThirdPersonGameMode
Cube
StaticMeshActor
DirectionalLight
DirectionalLight
GameNetworkManager0
GameNetworkManager
GameSession0
GameSession
GameStateBase0
GameStateBase
HUD0
HUD
ParticleEventManager0
ParticleEventManager
PlayerCameraManager0
PlayerCameraManager
PlayerController0
PlayerController
PlayerStartPIE0
PlayerStartPIE
PlayerState0
PlayerState
13 actors

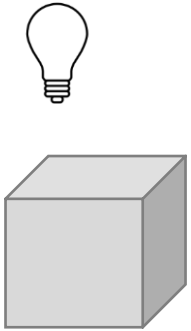


실습 LAB

고정 카메라 설정

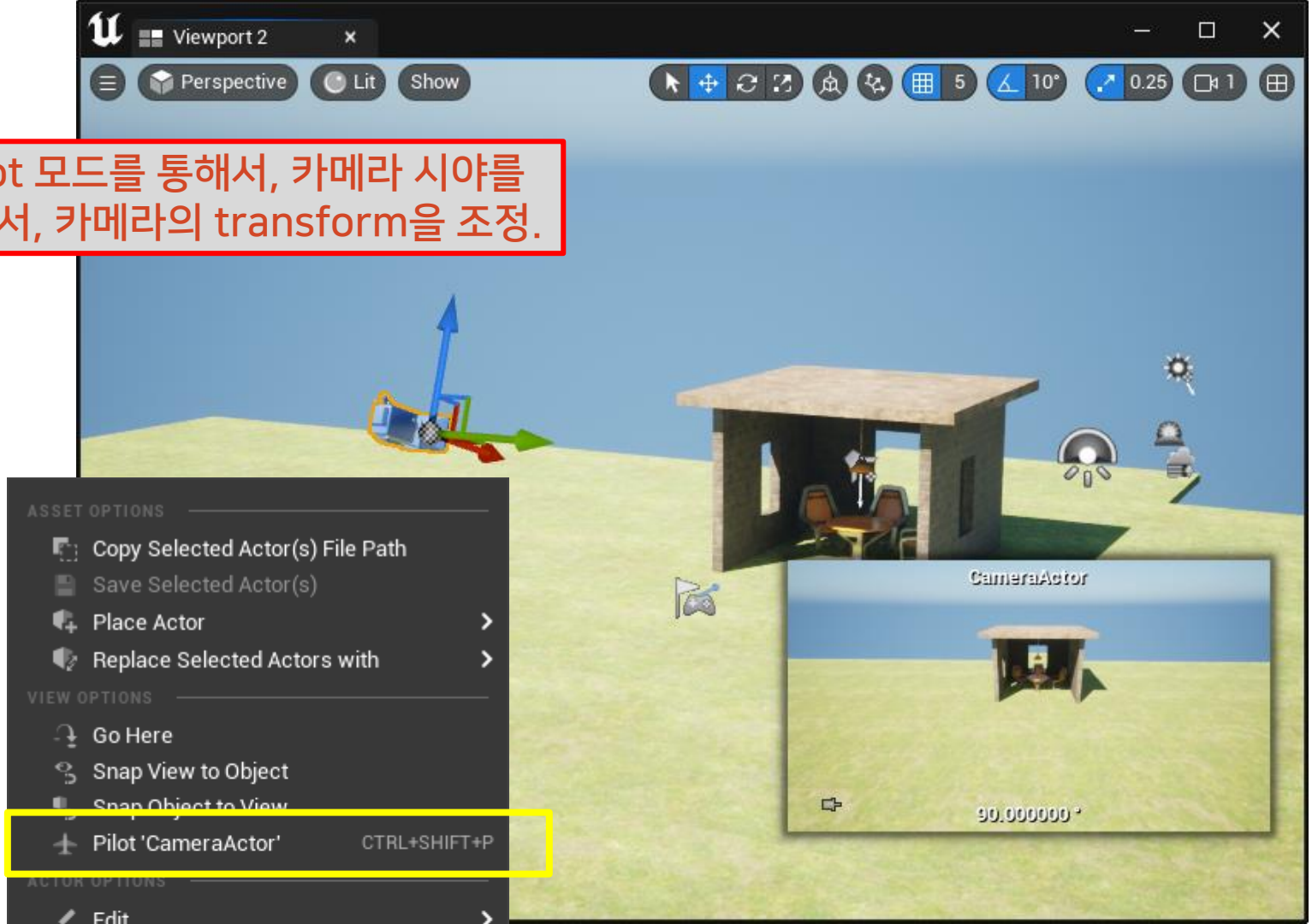
카메라를 우리가 직접 설정.
고정 카메라 설정.

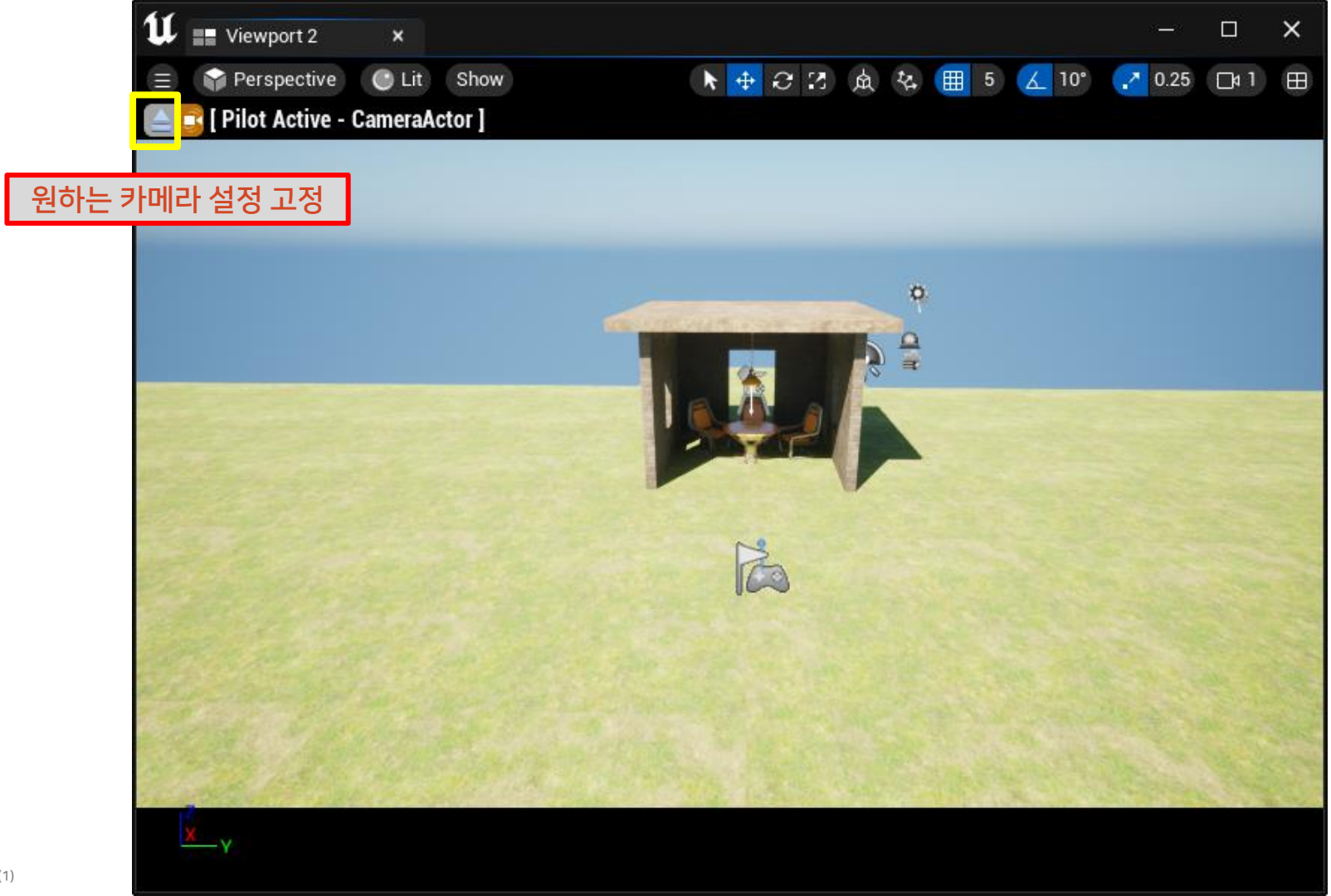


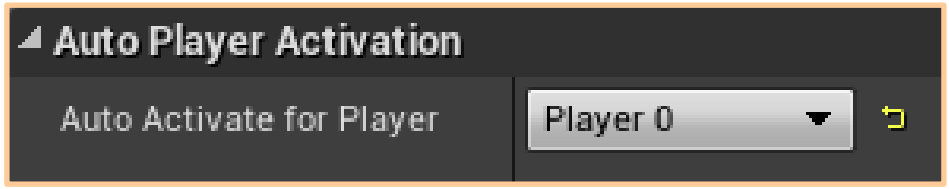


카메라 액터를 레벨에 배치

Pilot 모드를 통해서, 카메라 시야를 보면서, 카메라의 transform을 조정.

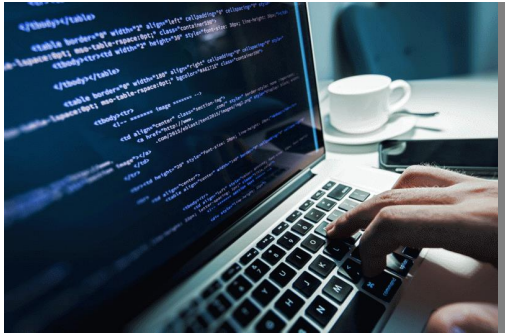



Viewport 2
Perspective
Lit
Show
5
10°
0.25
1
[Pilot Active - CameraActor]
원하는 카메라 설정 고정
X
Y



PlayerController의 카메라로 지정.
지정하지 않으면, PlayerController는 자동 생성된 내부 카메라를 메인 카메라로 활용함.


Play 실행 하면, 카메라의 위치가 고정된
상태에서, 키 입력에 따라서
“DefaultPawn”이 이동함.

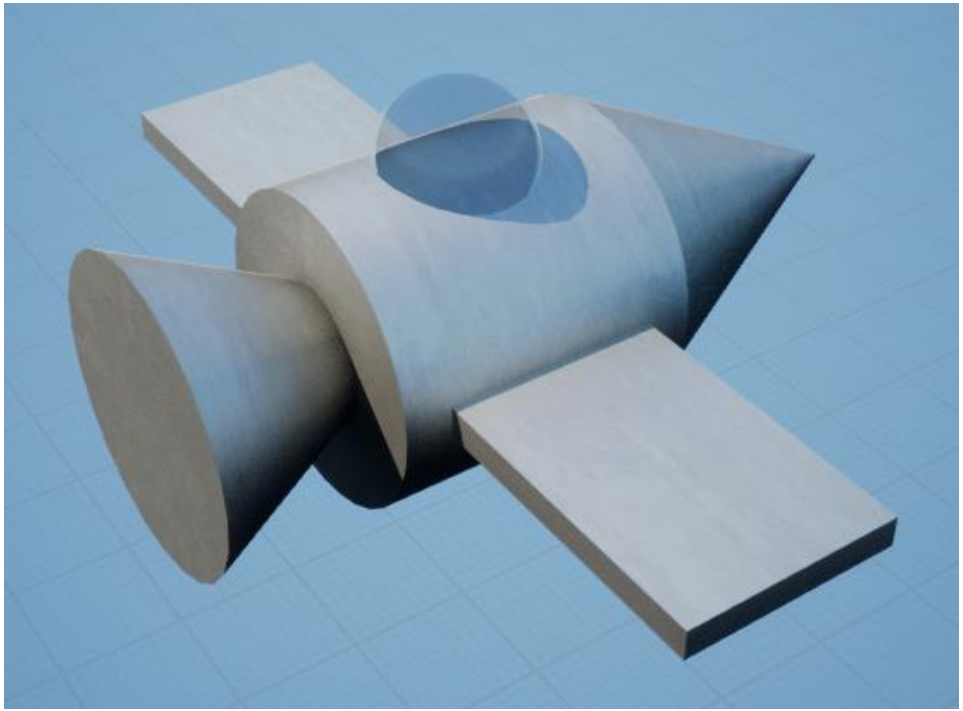


실습 LAB

Aircraft Blueprint 제작 및 조종

Aircraft Blueprint

- WASD 키이를 통해서 전후진, 좌우 이동

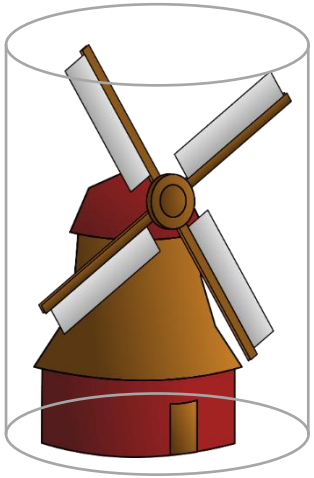


블루프린트 (클래스) 설계 삼요소

- **블루프린트 클래스를 설계할 때, 세가지 내용을 담아야 함.**
  - 액터가 어떻게 보일 것인가? → 외형
  - 액터는 어떤 식으로 행동하는가? → 행위, 로직
  - 액터의 물리적인 특성은? → 물리, 존재영역(예. 충돌영역)

풍차의 외형

날개의 회전 로직



풍차의 충돌 영역

블루프린트 설계 요령

- **그대로 사용할 수 있는 블루프린트가 있으면?**
  - 새로 만들지 말고, 기존 블루프린트를 사용

- **비슷한 블루프린트가 있으면?**
  - 뺄 것도 있고, 추가할 것도 있으면? " 복제 " 한 후, 수정.
  - 추가할 것만 있으면? " 파생(또는 상속) " 한 후, 기능 추가 구현.
  - 기능을 추가할 경우, “컴포넌트”로 이미 기능이 구현된 것이 있는가 확인!!

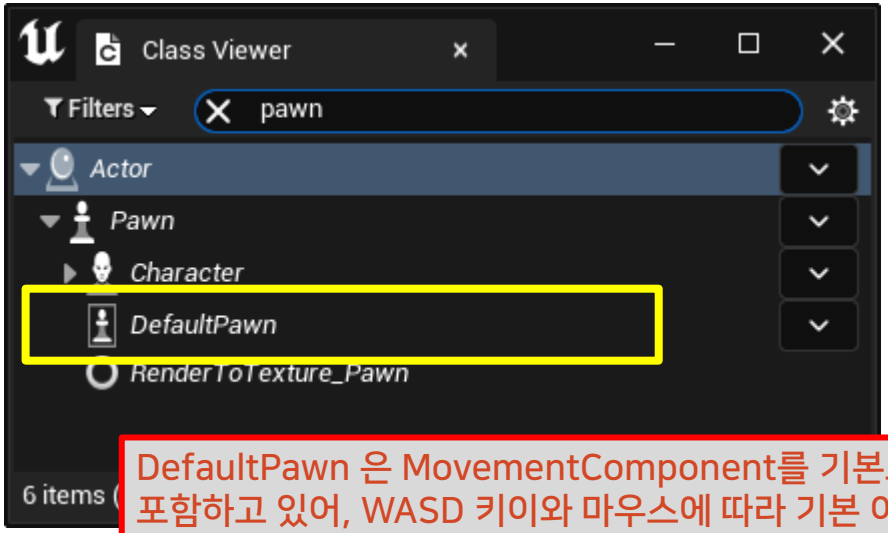
- **완전히 새로운 기능을 갖는 블루프린트라면?**
  - “Actor” 를 베이스 클래스로 한, 블루 프린트 클래스 새롭게 제작.
  - 기존 컴포넌트, 이벤트 그래프, 사용자 컴포넌트 등을 이용해서 클래스를 설계

블루프린트 설계

- 그대로 사용할 수 있는 블루프린트 있는가? NO

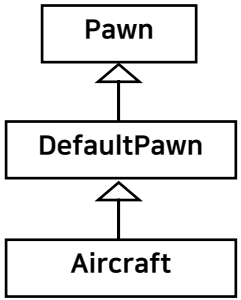
- 비슷한 블루프린트가 있는가? YES
  - “DefaultPawn”

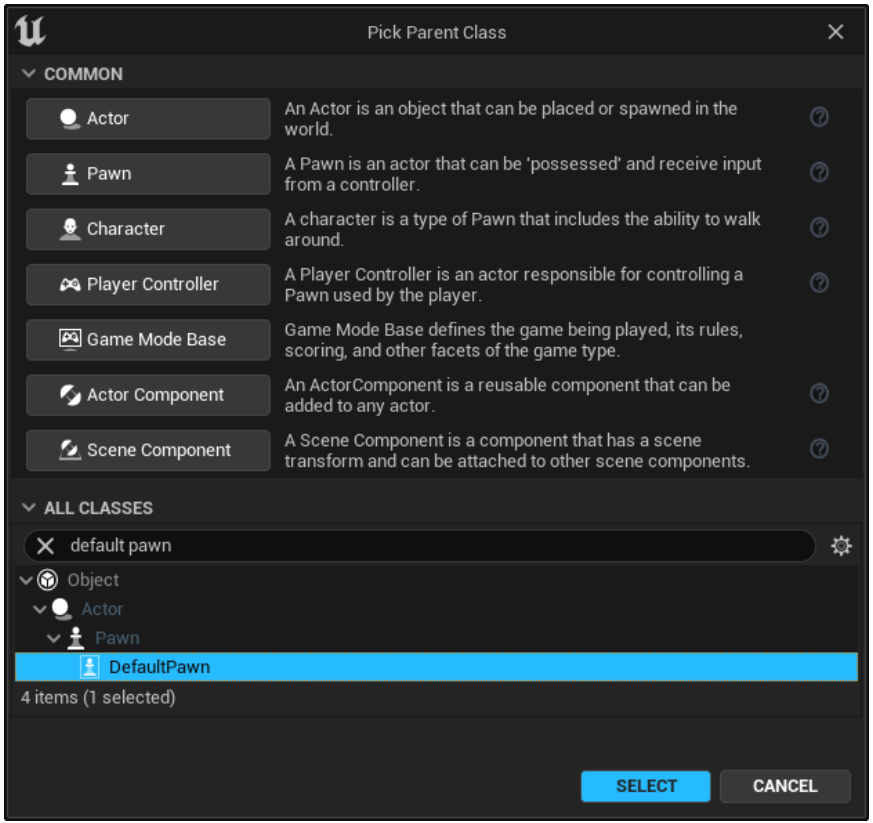
- 추가할 것만 있는가? YES
  - Static Mesh 모양만 추가 !!!



DefaultPawn 은 MovementComponent를 기본으로 포함하고 있어, WASD 키이와 마우스에 따라 기본 이동 및 회전 조작이 가능한 Pawn임.

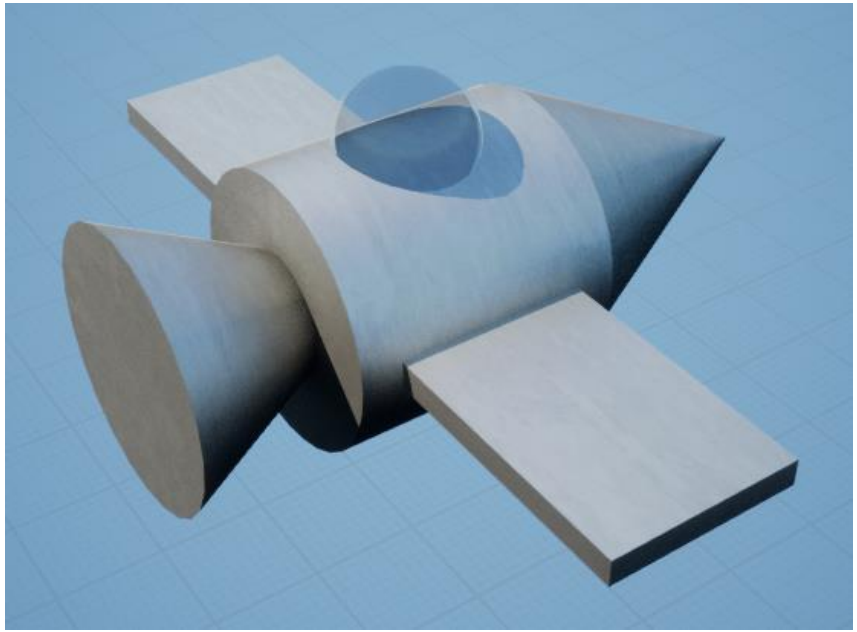
DefaultPawn 을 Parent로 하여, Blueprint를 만듬.



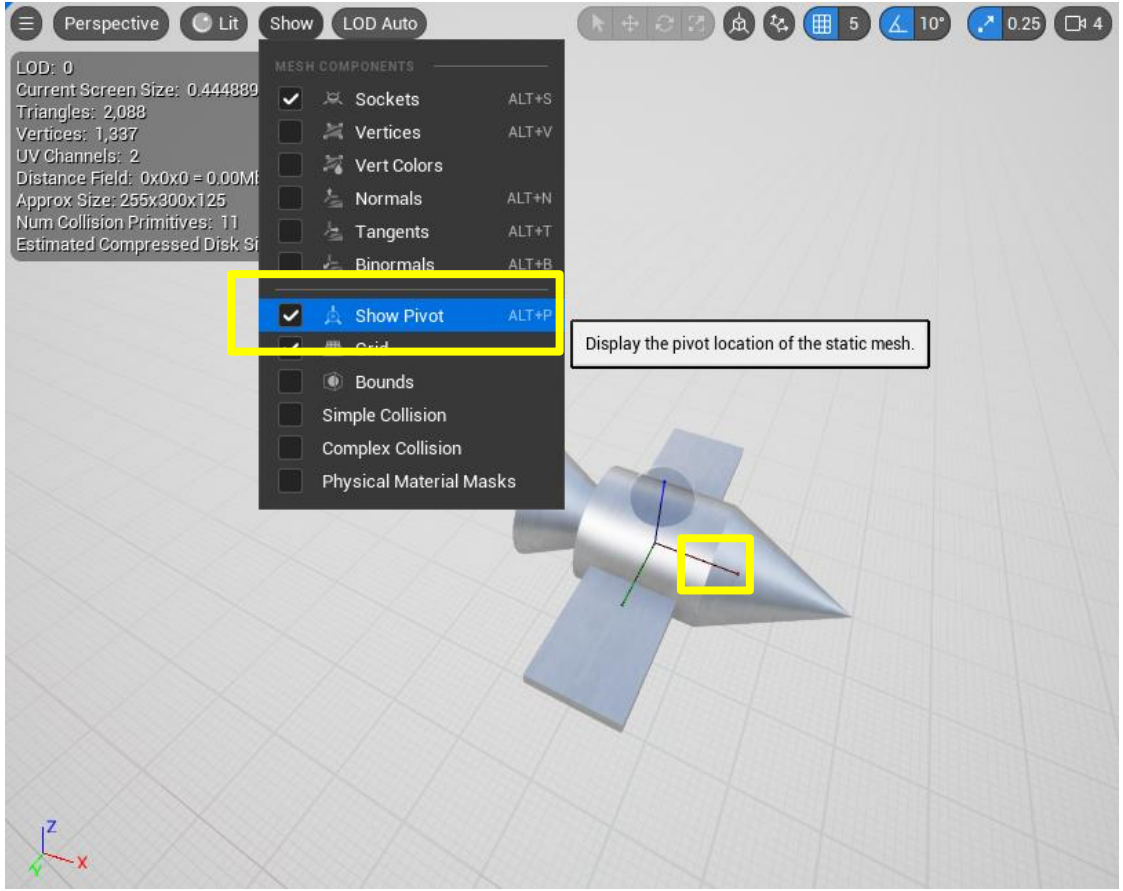


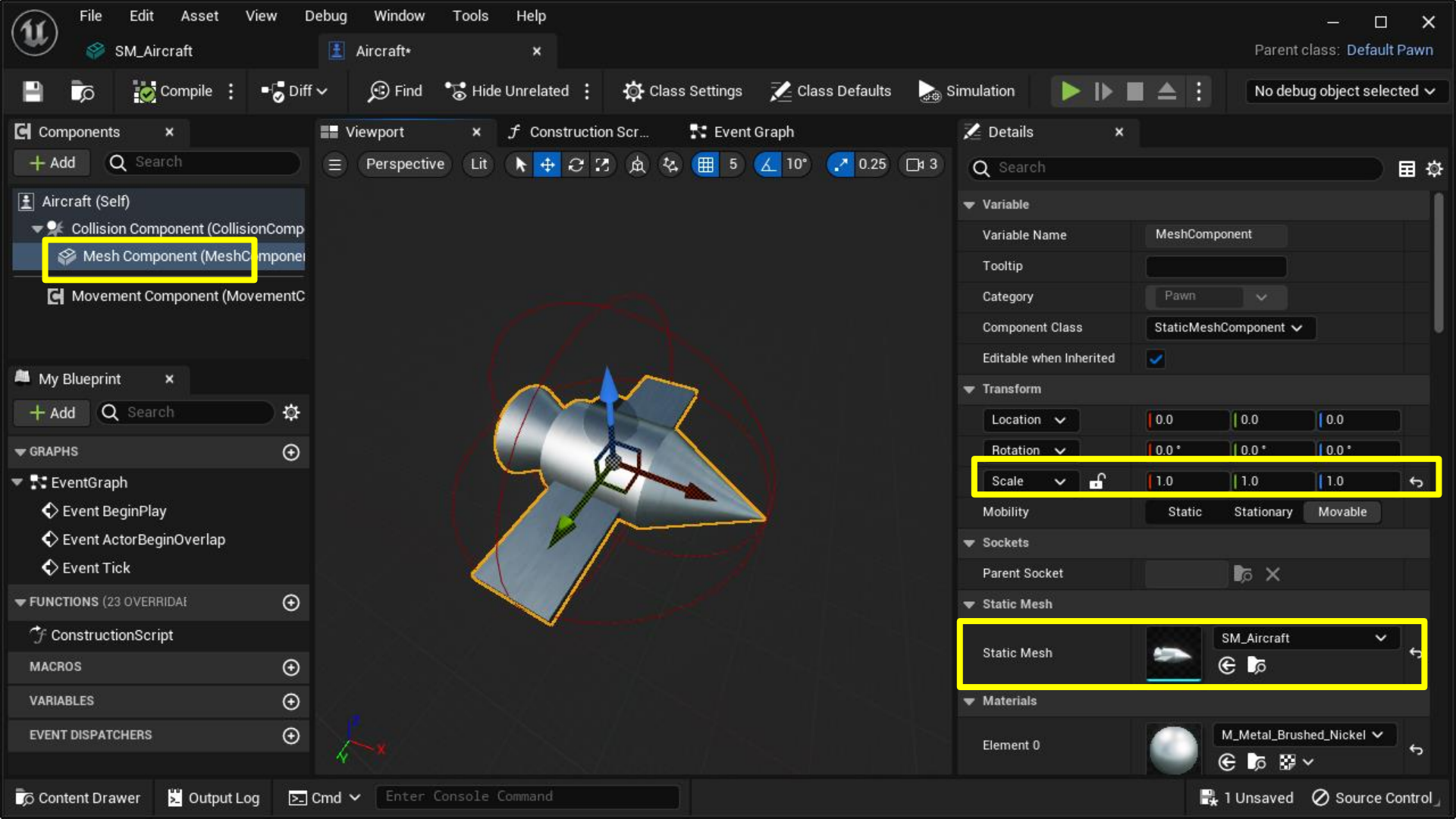
Aircraft Static Mesh 만들기

- Cube, Sphere, Cylinder, Cone 을 이용해서, 비행기 모양을 만듬.
- 액터 머징을 통해 단일 메시로 만듬. – SM_Aircraft



Forward Direction – X – Red 방향 확인




File
Edit
Asset
View
Debug
Window
Tools
Help
SM_Aircraft
Aircraft*
Parent class: Default Pawn
Compile
Diff
Find
Hide Unrelated
Class Settings
Class Defaults
Simulation
No debug object selected
Components
Add
Search
Aircraft (Self)
Collision Component (CollisionComp
Mesh Component (MeshC
Movement Component (MovementC
My Blueprint
Add
Search
GRAPHS
EventGraph
Event BeginPlay
Event ActorBeginOverlap
Event Tick
FUNCTIONS (23 OVERRIDE
ConstructionScript
MACROS
VARIABLES
EVENT DISPATCHERS
Viewport
Construction Scr...
Event Graph
Perspective
Lit
5
10°
0.25
3
Details
Search
Variable
Variable Name
MeshComponent
Tooltip
Category
Pawn
Component Class
StaticMeshComponent
Editable when Inherited
Transform
Location
0.0
0.0
0.0
Rotation
0.0 °
0.0 °
0.0 °
Scale
1.0
1.0
1.0
Mobility
Static
Stationary
Movable
Sockets
Parent Socket
Static Mesh
Static Mesh
SM_Aircraft
Materials
Element 0
M_Metal_Brushed_Nickel
Content Drawer
Output Log
Cmd
Enter Console Command
1 Unsaved
Source Control

File Edit Asset View Debug Window Tools Help

SM_Aircraft | Aircraft* | Parent class: Default Pawn

Compile | Diff | Find | Hide Unrelated | Class Settings | Class Defaults | Simulation | No debug object selected

Components

Add | Search

- Aircraft (Self)
  - Collision Component (CollisionComp)
  - Mesh Component (MeshComponent)
  - Movement Component (MovementC

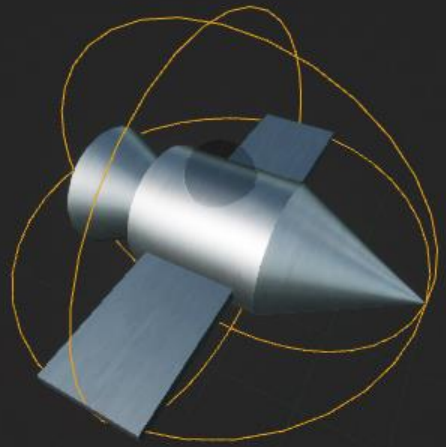
My Blueprint

Add | Search

- GRAPHS
  - EventGraph
    - Event BeginPlay
    - Event ActorBeginOverlap
    - Event Tick
- FUNCTIONS (23 OVERRIDE
  - ConstructionScript
- MACROS
- VARIABLES
- EVENT DISPATCHERS

Viewport | Construction Scr... | Event Graph

Perspective | Lit | 5 | 10° | 0.25 | 3



충돌구체의 반지름을 적절하게 설정

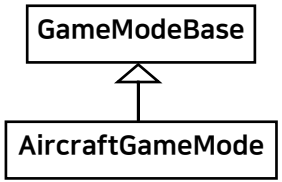
Details

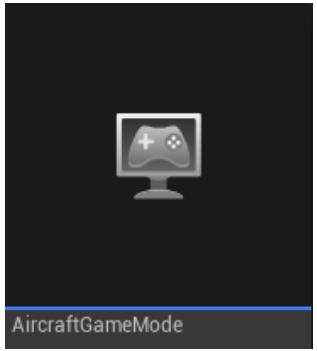
Search

- Variable
  - Variable Name: CollisionComponent
  - Tooltip:
  - Category: Pawn
  - Component Class: SphereComponent
  - Editable when Inherited: ✓
- Transform
  - 1.0
  - Movable
- Sockets
  - Parent Socket:
- Shape
  - Sphere Radius: 150.0
- Advanced
- Navigation
  - Dynamic Obstacle: ✓
  - Area Class Override: None
  - Use System Default Ob... ✓
  - Fill Collision Underneath...

Content Drawer | Output Log | Cmd | Enter Console Command | 1 Unsaved | Source Control

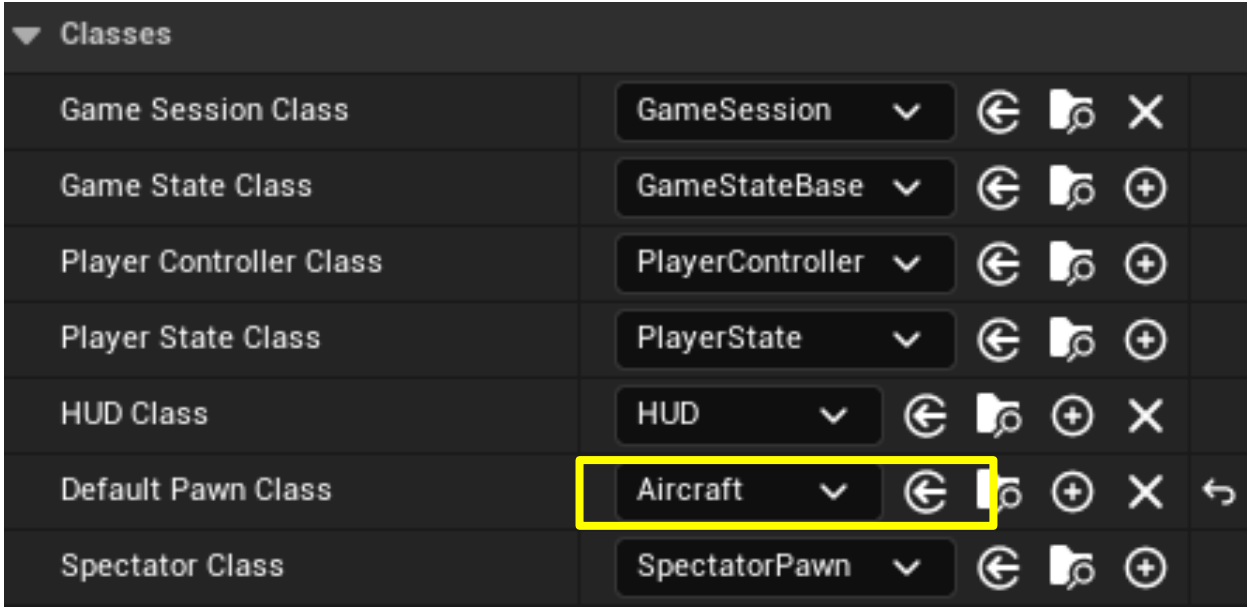
게임 모드 만들기 : Blueprint 클래스로 만듬.





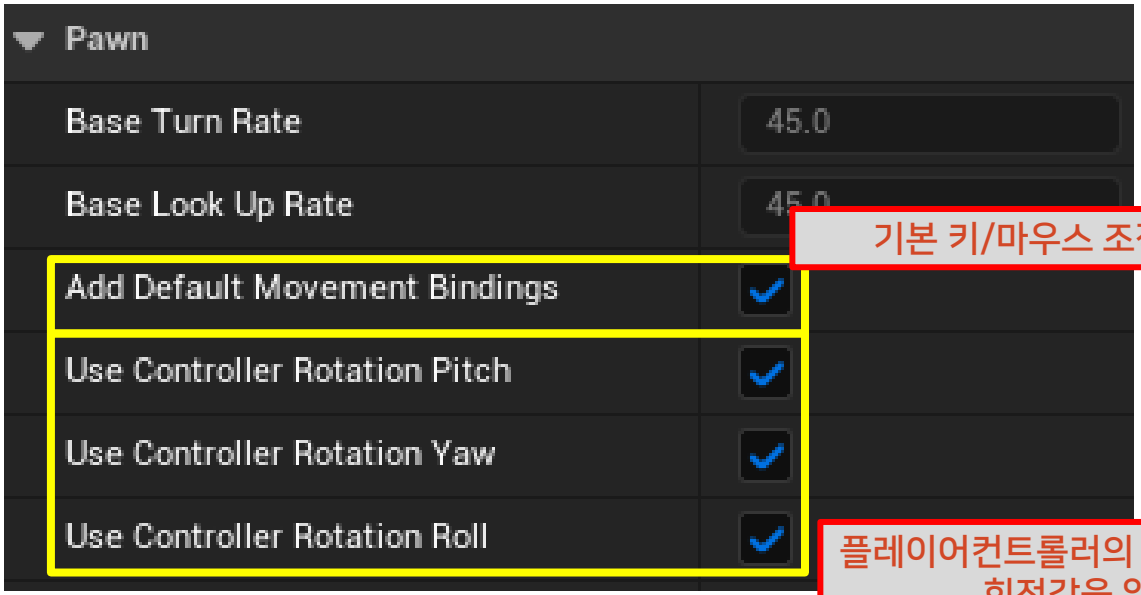
GameModeBase를 베이스클래스로
하는 블루프린트 클래스를 만듬.

AircraftGameMode



'Default Pawn Class'를
Aircraft 로 지정 !

Aircraft Blueprint 의 Class Defaults 설정



기본 키/마우스 조작 자동 적용

플레이어컨트롤러의 회전값과 Pawn의 회전값을 일치시킴.


Viewport 2

언리얼 엔진 핵심 클래스 다이어그램