

Creating a SuperSideScroller Game

10th Week, 2021



UNREAL
ENGINE



Project Breakdown

- › The example of the famous *Super Mario Bros*, released on the **Nintendo Entertainment System (NES)** console in 1985
 - Two-Dimensional Movement
 - › Although our SuperSideScroller game will be in 3D and not pure 2D, the movement of our Character will work identically to that of Mario.
 - Jumping
 - Character Power-Ups
 - Enemy AI
 - Collectibles
 - › Our SuperSideScroller game will allow players to collect coins.



The Player Character

- › Almost all of the functionality that we want for our Character is given to us by default when using the **Side Scroller** game project template in Unreal Engine 4.



Exercise 10.01: Creating the Side-Scoller Project and Using the Character Movement Component

Unreal Project Browser

Select or Create New Project

Recent Projects

- Dodgeball
- Exercise4_01
- Activity_Anim
- Exercise3_01
- CharAnim
- Exercise2_01
- Exercise1_01

More

New Project Categories

- Games**
Start your game development journey with one of our key classes, levels, and examples.
- Film, Television, and Live Events**
Choose from templates and examples for nDisplay, VR Scouting, and virtual production workflows.
- Architecture, Engineering, and Construction**
Select a starting point for multi-user design reviews, photorealistic architectural design visualizations, sunlight studies, or stylized renderings.
- Automotive, Product Design, and Manufacturing**
Find templates for multi-user design reviews, photobooth studio environments, and product configurators.

Next  Open Project Cancel



Select Template



Blank



First Person



Flying



Puzzle



Rolling



Third Person



Top Down

Twin Stick
ShooterHandheld
ARSide
Scroller2D Side
Scroller

Vehicle

Virtual
RealityVehicle
Advanced

Side Scroller

This side scroller template features an animated skeletal mesh character with a camera positioned at the character's side. Movement, which can be controlled with either keyboard, controller or virtual joystick on a touch device is limited to two dimensions: forward, backward and jumping. A number of ledges are featured in the level and the character can jump between them.

Asset Type References:

Animation Sequence, Animation Blueprint, Skeletal Mesh, Blend Space 1D, Skeleton

Class Type References:

CameraComponent, SpringArmComponent, PaperFlipbook, PaperCharacter, GameMode

 < Back

Next

Create Project

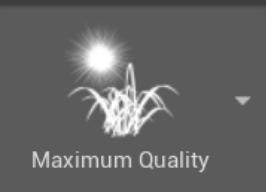
Cancel



Project Settings



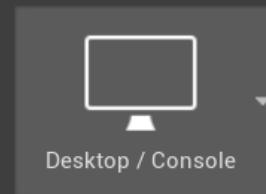
Choose whether to create a Blueprint or C++ project.



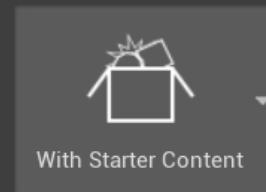
Choose the performance characteristics of your project.



Choose if real-time raytracing should be enabled in the new project.



Choose the closest equivalent target platform. Don't worry, you can change this later in the **Target Hardware** section of **Project Settings**.



Enable to include an additional content pack containing simple placeable meshes with basic materials and textures. You can also add the **Starter Content** to your project later using **Content Browser**.

Select a **location** for your project to be stored.

C:\Users\sunje\Desktop\Unreal

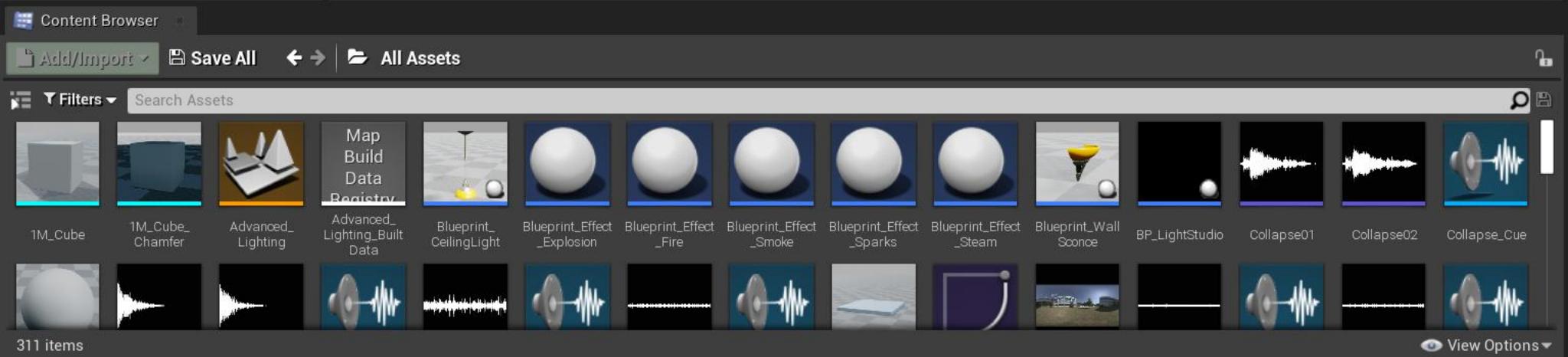
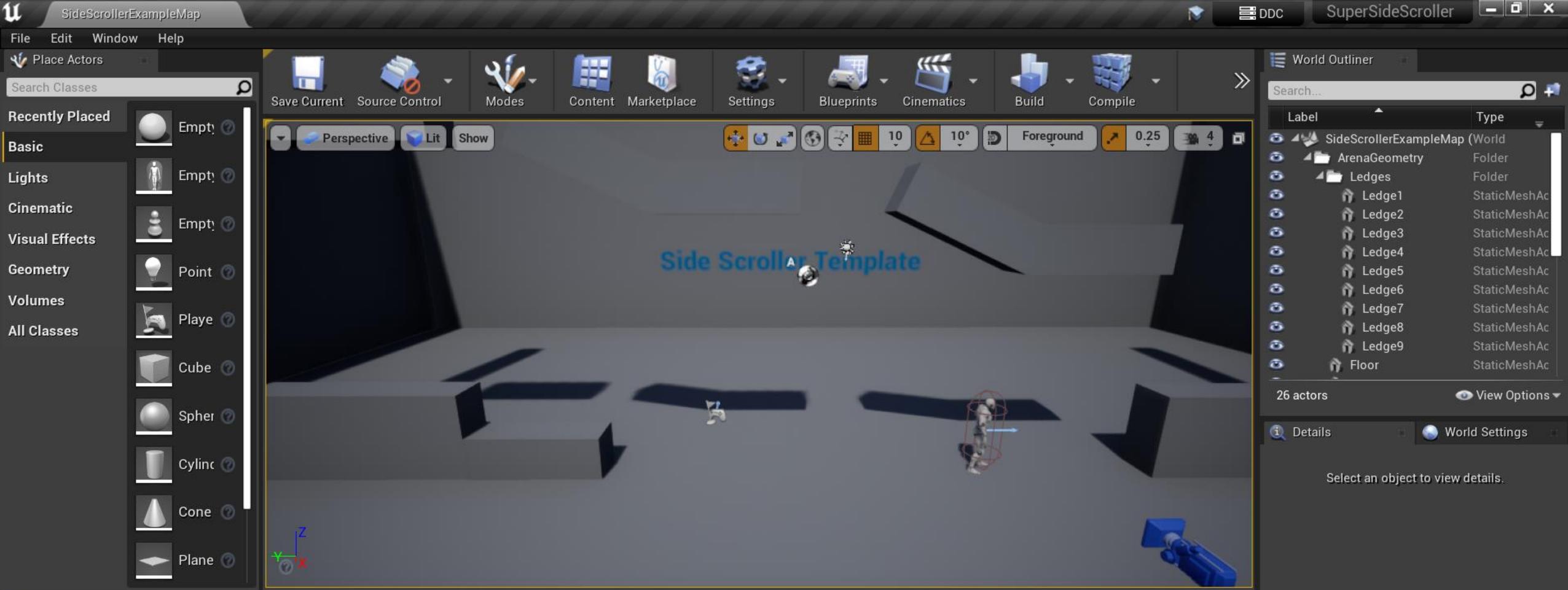
SuperSideScroller

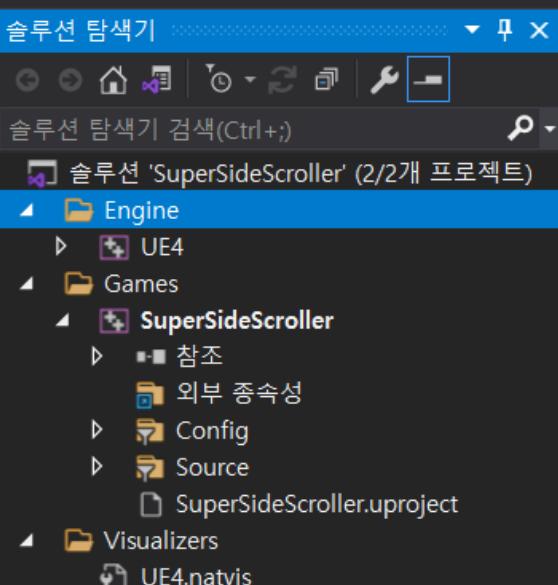
Folder

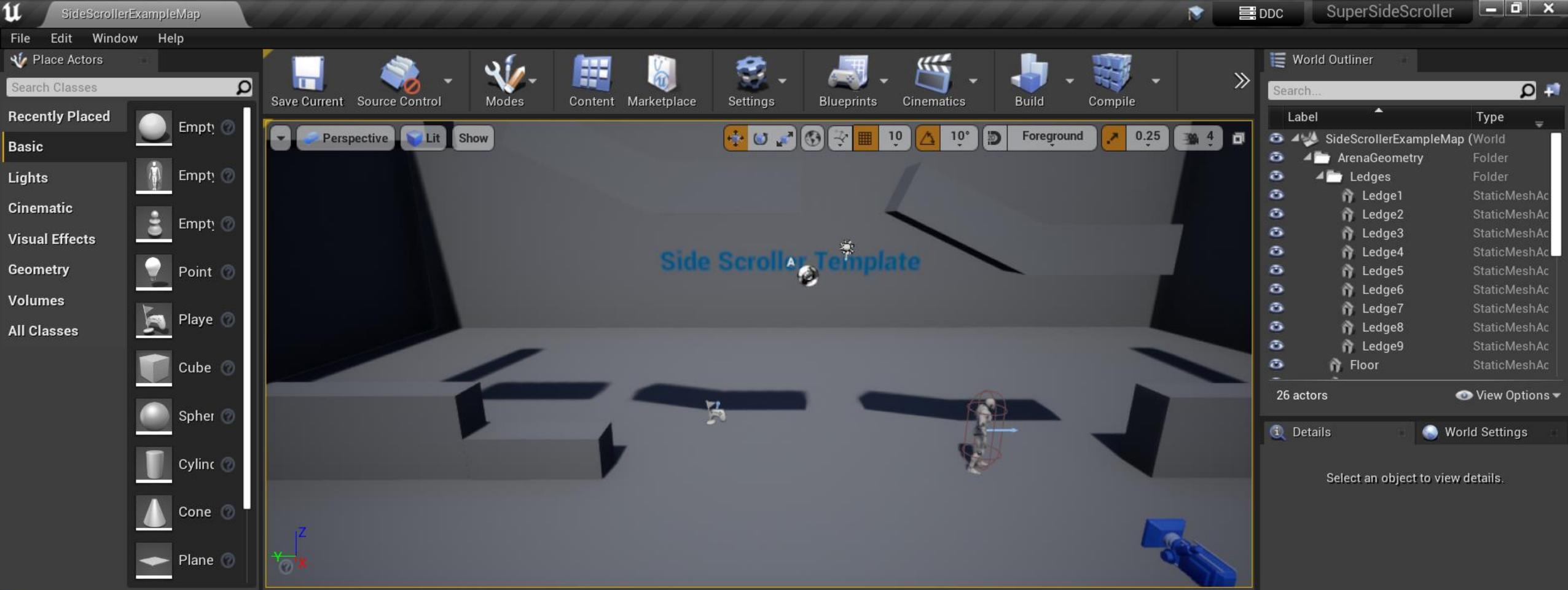
Name

Create Project

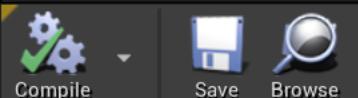
Cancel







This screenshot shows the Content Browser panel of the Unreal Engine Editor. The top bar includes "Add/Import" and "Save All" buttons, along with navigation icons. The main area displays the "Content" tree under "SideScrollerCPP/Blueprints". A file named "SideScrollerCharacter" is selected and highlighted with a yellow border. A large red arrow points from the bottom left towards this selected file. The bottom left corner of the Content Browser has a red border. The bottom right corner of the Content Browser has a red border.



Class Details

NOTE: This is a data only blueprint, so only the default values are shown. It does not have any script or variables. If you want to add some, [Open Full Blueprint Editor](#)



Search Details

Transform

CameraBoom

Location ▾

X 0.0 Y 0.0 Z 0.0

Absolute Rotation ▾

X 0.0° Y 0.0° Z -179.999985°

Scale ▾

X 1.0 Y 1.0 Z 1.0

Mesh

Location ▾

X 0.0 Y 0.0 Z -97.0

Rotation ▾

X 0.0° Y 0.0° Z -90.0°

Scale ▾

X 1.0 Y 1.0 Z 1.0

CapsuleComponent

Scale ▾

X 1.0 Y 1.0 Z 1.0

Mobility

Static Stationary Movable

Animation

Animation Mode

Use Animation Blueprint ▾

Anim Class

ThirdPerson_AnimBP_C

Disable Post Process Blueprint

Mesh

Skeletal Mesh



SK_Mannequin



Skin Cache Usage

0 Array elements + -

Pre/Post Skin Deltas Usage

0 Array elements + -

Camera

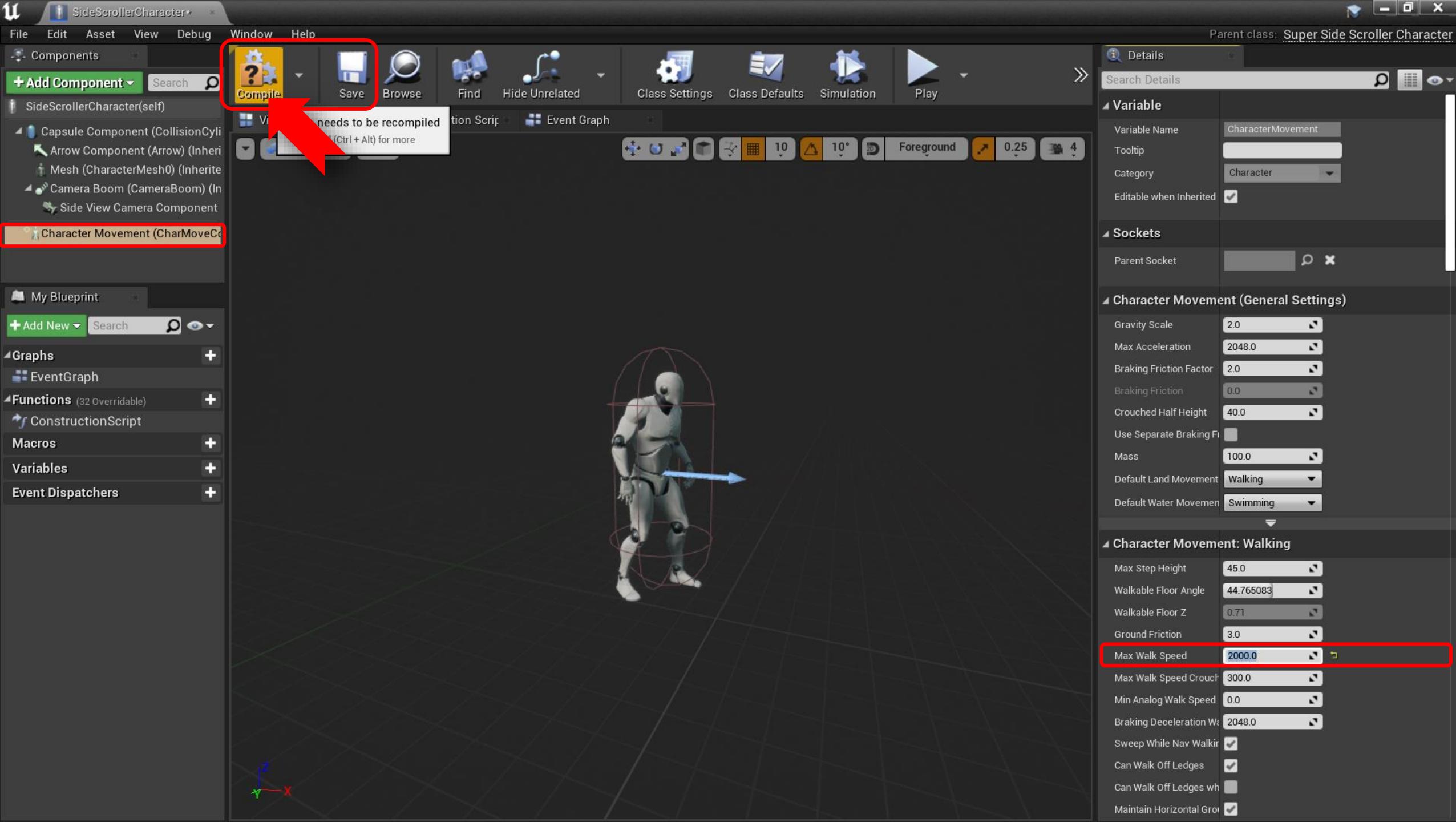
Side View Camera Component

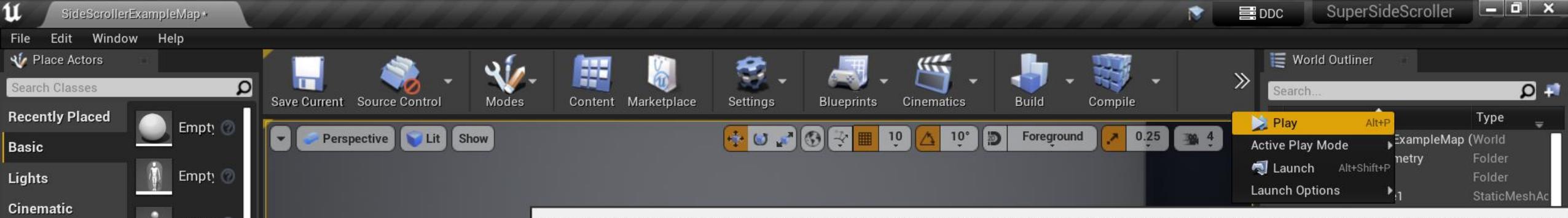
None

Crouched Eye Height

22.0

Public View

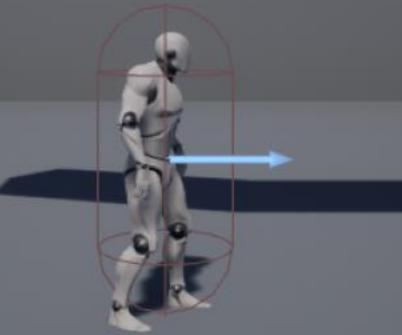




Launches a game preview session in the same mode as the last game preview session launched from the Game Preview Modes dropdown next to the Play button on the level editor toolbar

hold (Ctrl + Alt) for more

Side Scroller Template



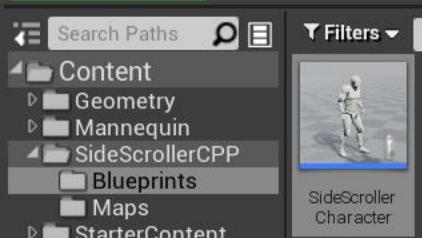
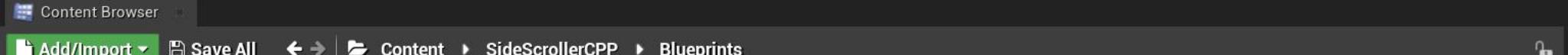
Select an object to view details.

26 actors

View Options

Details

World Settings



1 item (1 selected)

View Options



Activity 10.01: Making Our Character Jump Higher

The screenshot shows the Unreal Engine Editor interface. The main view displays a "Side Scroller Template" scene with a character model and a red bounding box. The Content Browser at the bottom left shows a folder structure with a red box around the "SideScrollerCPP" folder, and a red arrow points to the "SideScrollerCharacter" blueprint file within it. The top right panel lists actors in the scene, including various ledges and a floor, with their respective static mesh components.

Cinematic

Visual Effects

Geometry

Volumes

All Classes

Content Browser

Add/Import Save All

Content > SideScrollerCPP > Blueprints

Filters Search Blueprint

Content

Geometry

Mannequin

SideScrollerCPP

Blueprints

Maps

StarterContent

C++ Classes

1 item (1 selected)

View Options

Ledge1 StaticMeshActor

Ledge2 StaticMeshActor

Ledge3 StaticMeshActor

Ledge4 StaticMeshActor

Ledge5 StaticMeshActor

Ledge6 StaticMeshActor

Ledge7 StaticMeshActor

Ledge8 StaticMeshActor

Ledge9 StaticMeshActor

Floor StaticMeshActor

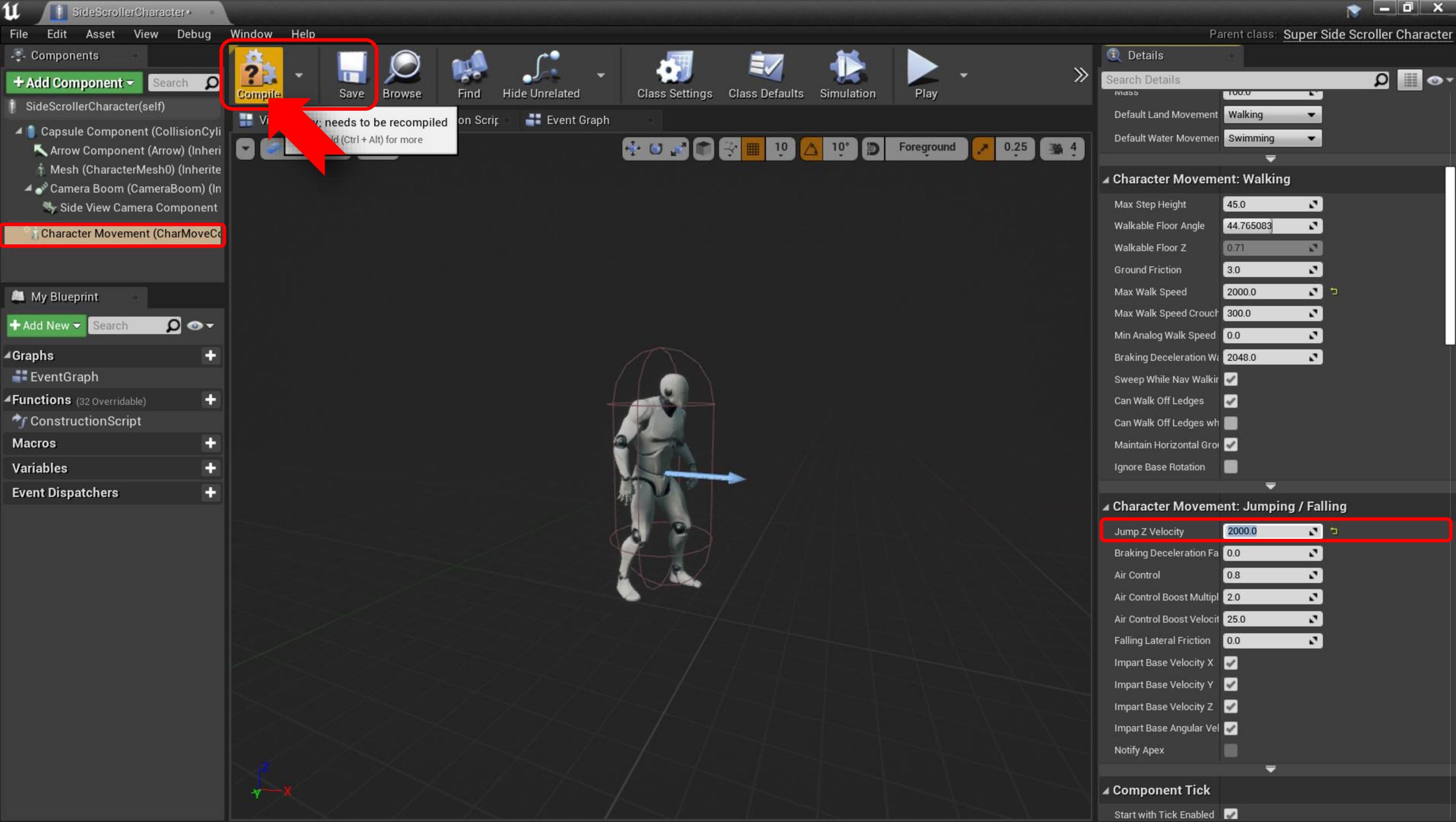
26 actors

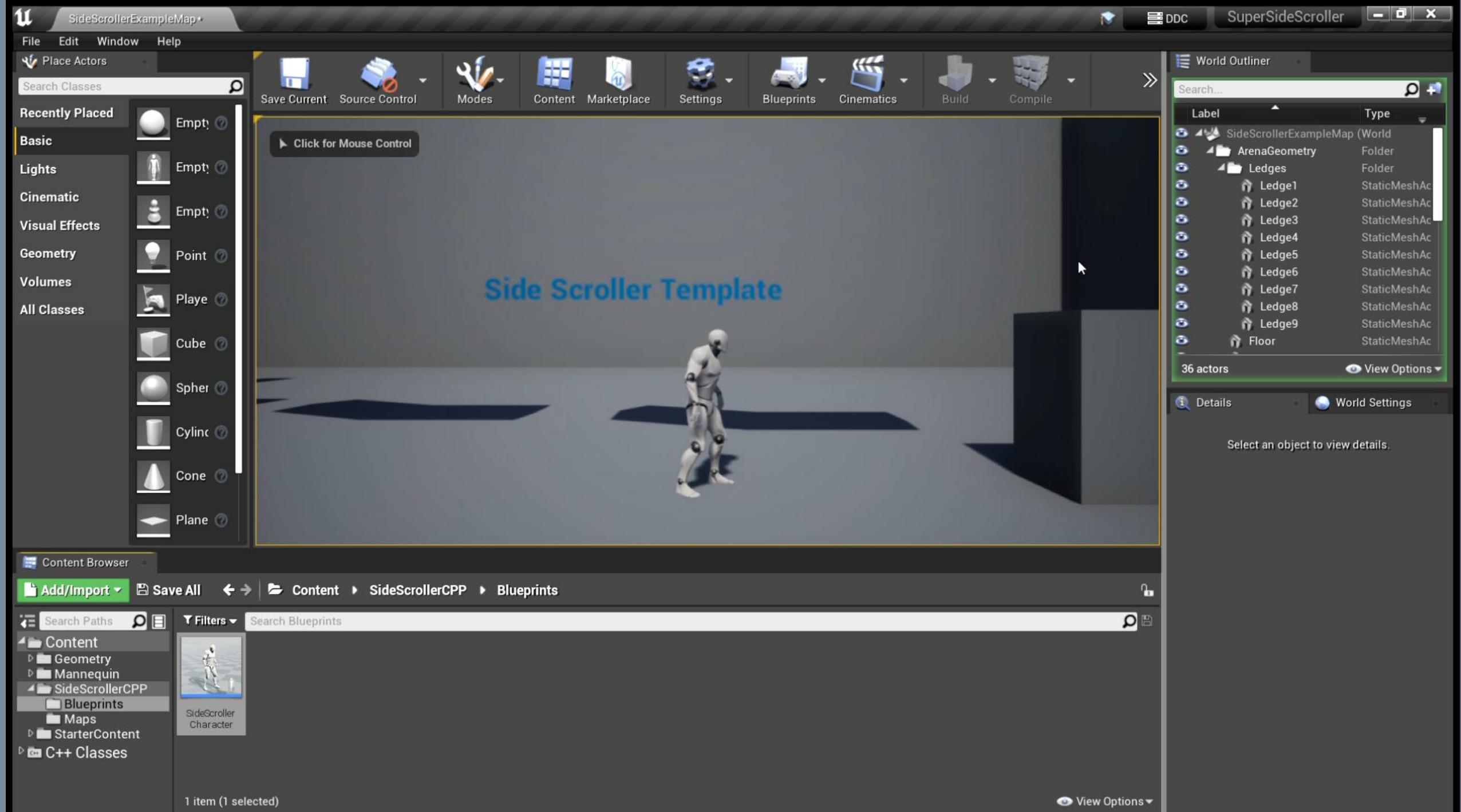
View Options

Details

World Settings

Select an object to view details.







Features of Our Side-Scroller Game (1)

- › Enemy Character
 - Our SuperSiderScroller project will support one enemy type.
 - › The enemy will have a basic back-and-forth movement pattern and will not support any attacks; only colliding with the player Character.
 - › We need to set the two locations to move between for the enemy AI, and next, we will need to decide whether the AI should change locations.
- › Power-Up
 - The SuperSideScroller game project will support one type of power-up, in the form of a potion that the player can pick up from the environment.
 - This potion power-up will increase the movement speed of the player and maximum height to which the player can jump.



Features of Our Side-Scroller Game (2)

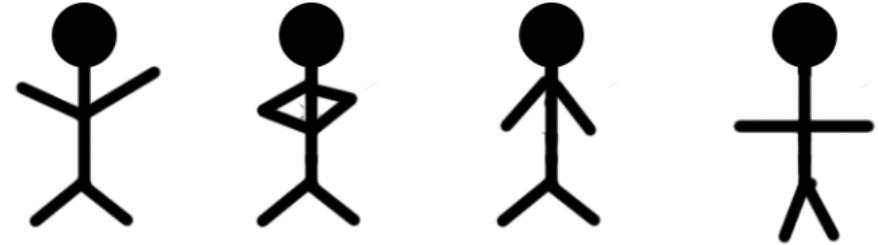
- › Collectable
 - For the SuperSideScroller game project, the coins will serve a single purpose: to give the player the goal of collecting as many coins as they can without being destroyed by the enemy.
 - › The collectible needs to interact with our player.
→ collision detection and UI
 - › The collectible needs a visual static mesh presentation so that the player can identify it in the level.
- › HUD (Heads-Up Display)
 - For the SuperSideScroller project, there will be one HUD element, which will display to the player how many coins they have collected.

Steps in Animation

› Character Animation Pipeline

- The concept stage

› This is almost always done in 2D.



< A very simple example of a 2D Character concept >

- The 3D modeling stage

› Models are typically made in programs such as 3DS Max or Maya.

- The rigging state

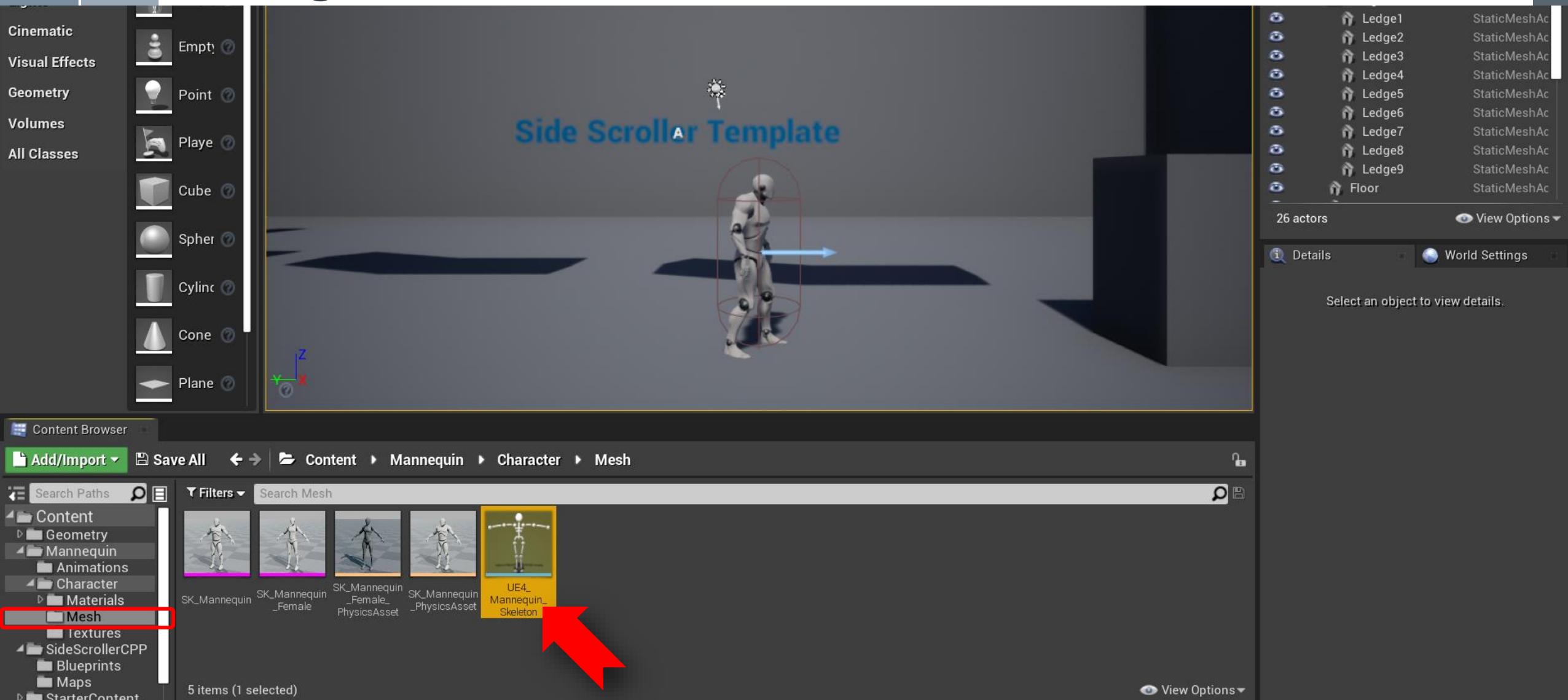
› Rigging means building a series of bones that form the frame of a Character's skeleton.

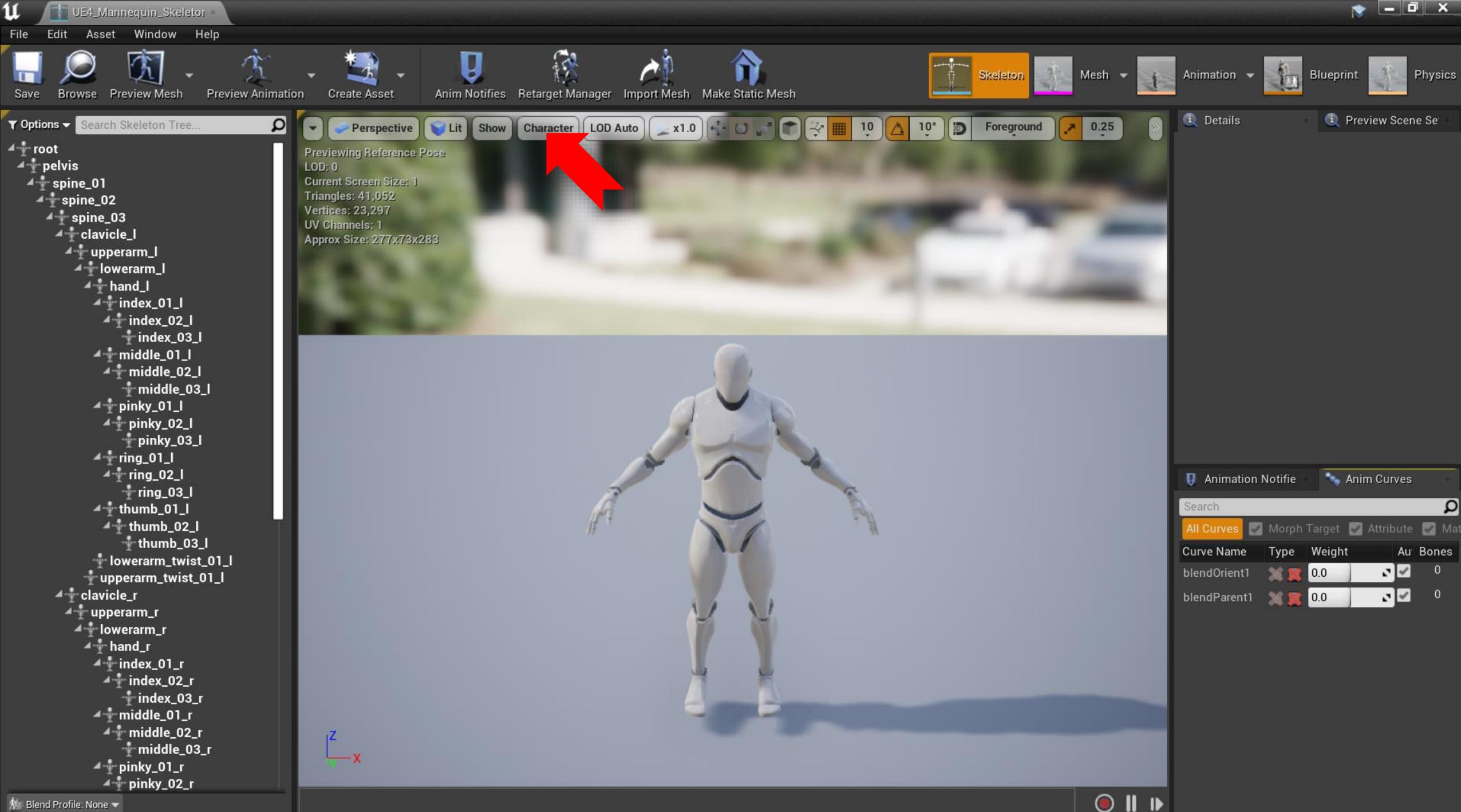
- Animation

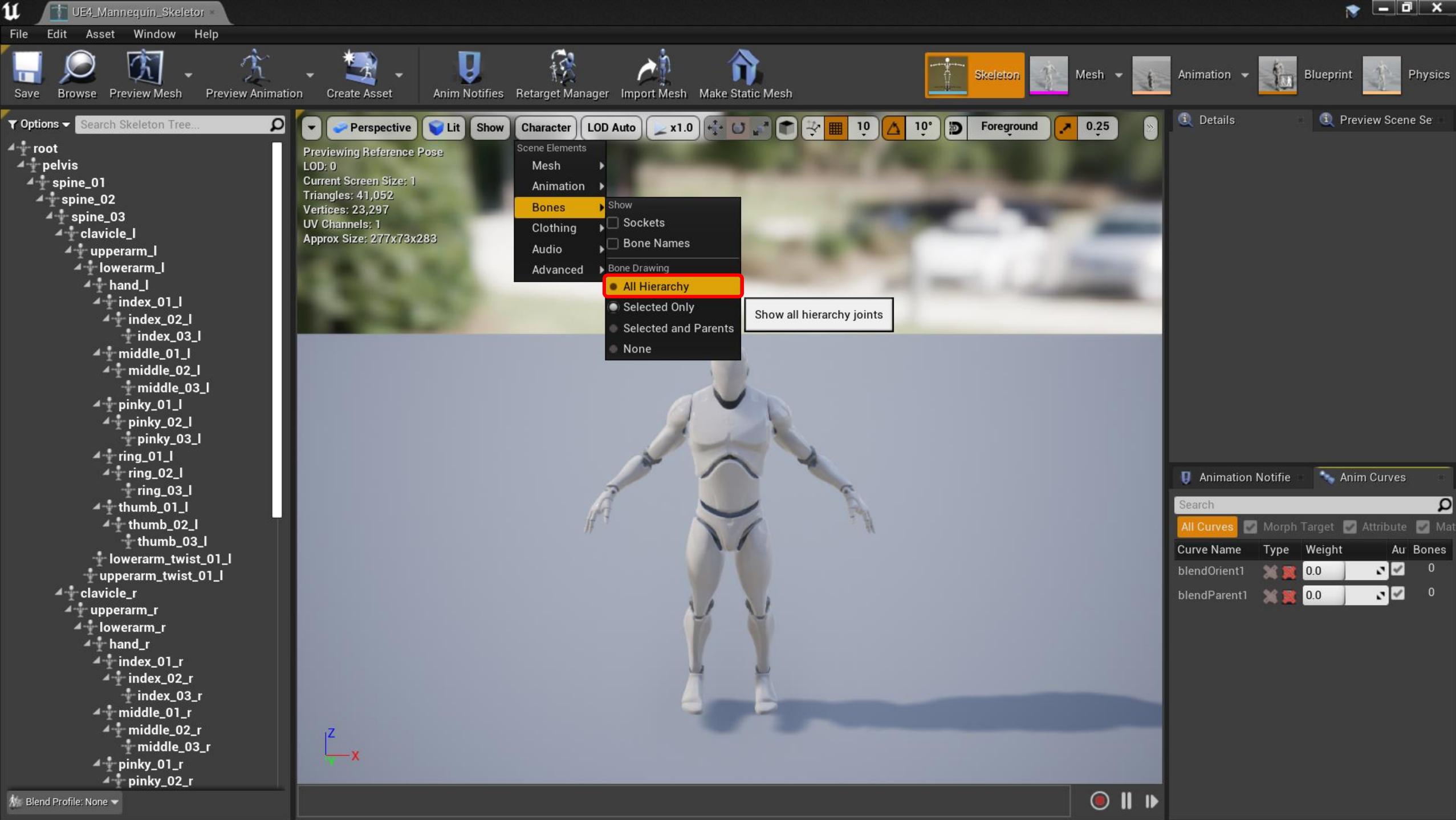
› The process of recording the change toe bone position, rotation, and scale over time is what results in an animation.

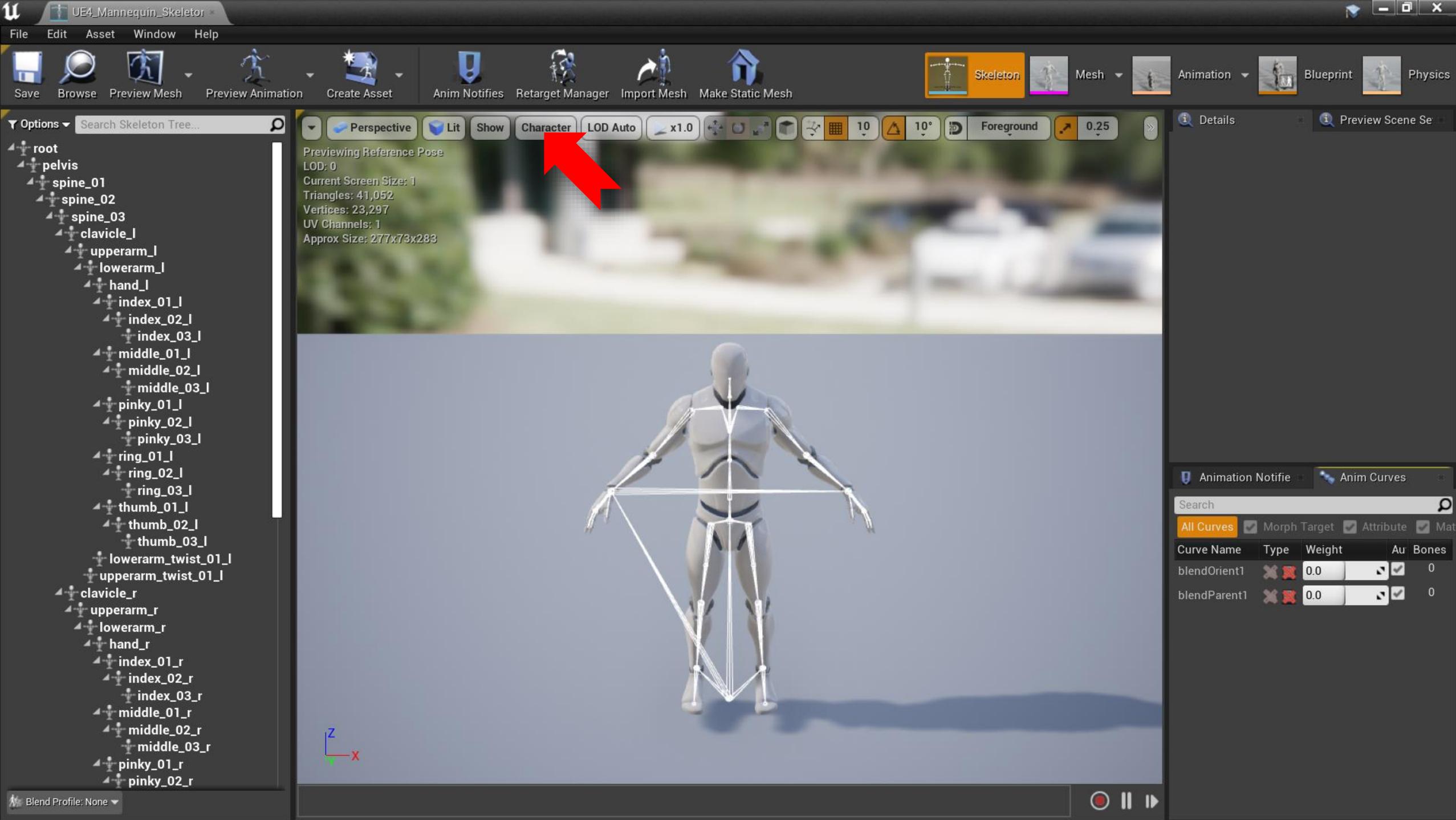
- Asset Export and Import

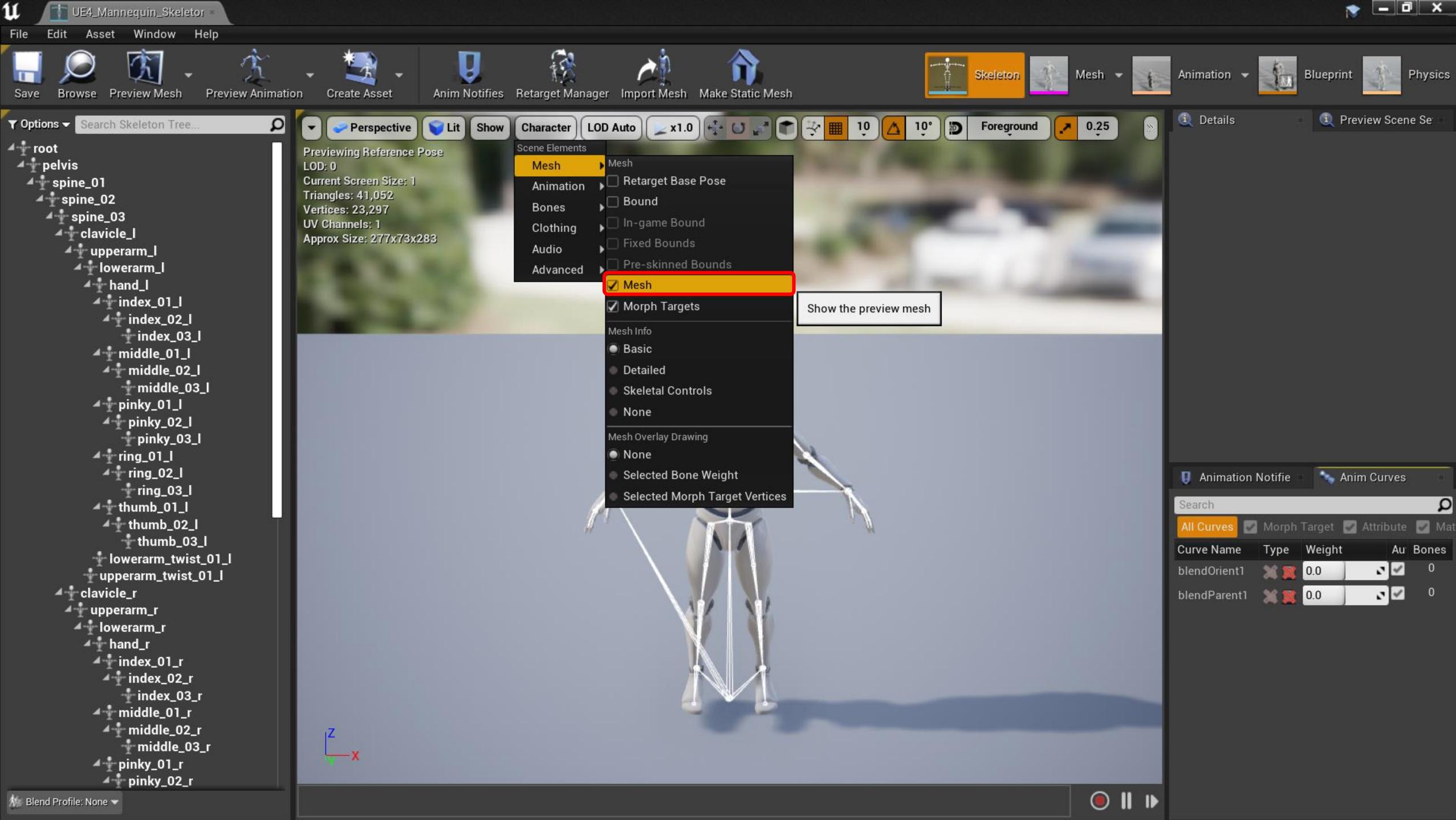
Exercise 10.02: Exploring the Persona Editor and Manipulating the Default Mannequin Skeleton Weights

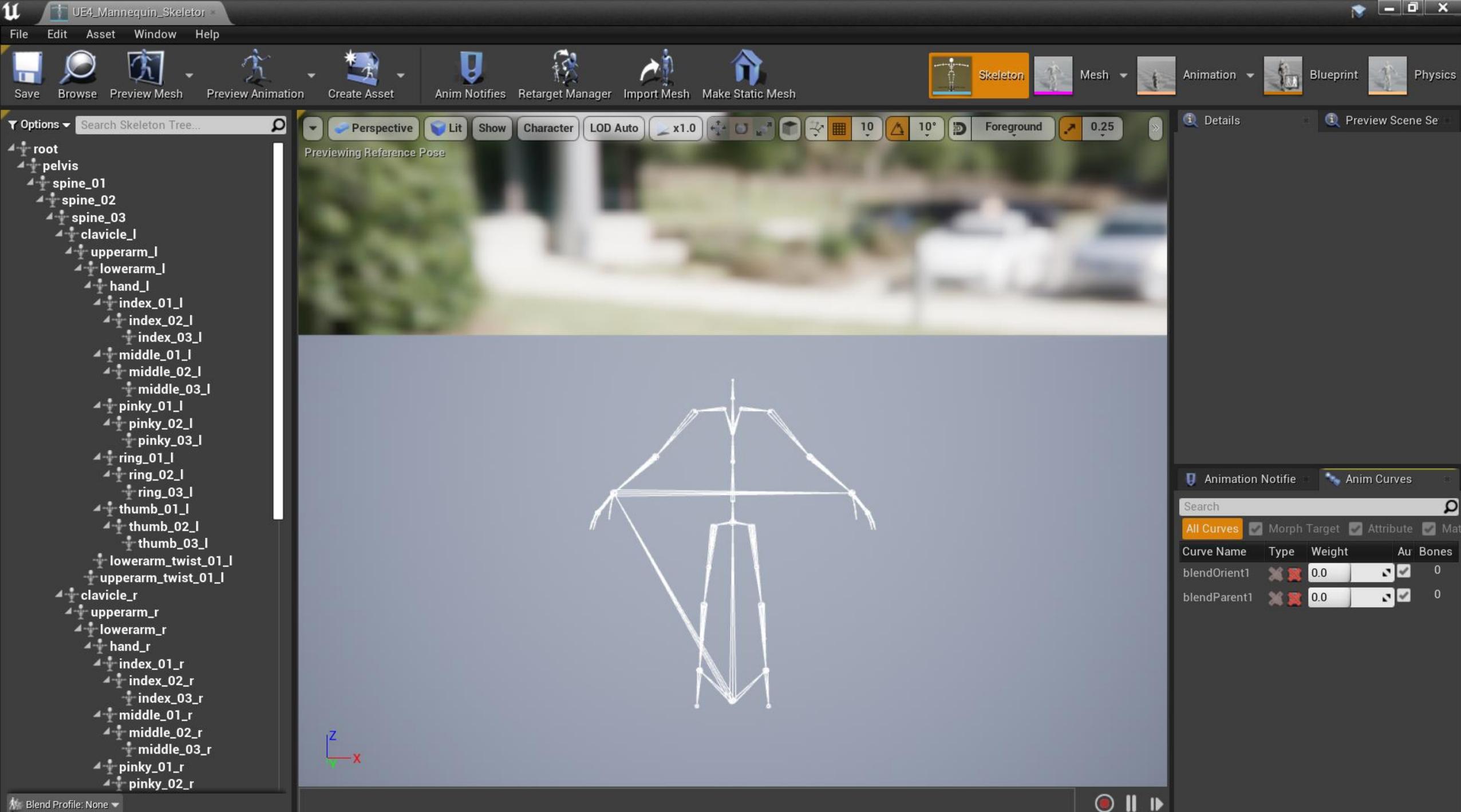


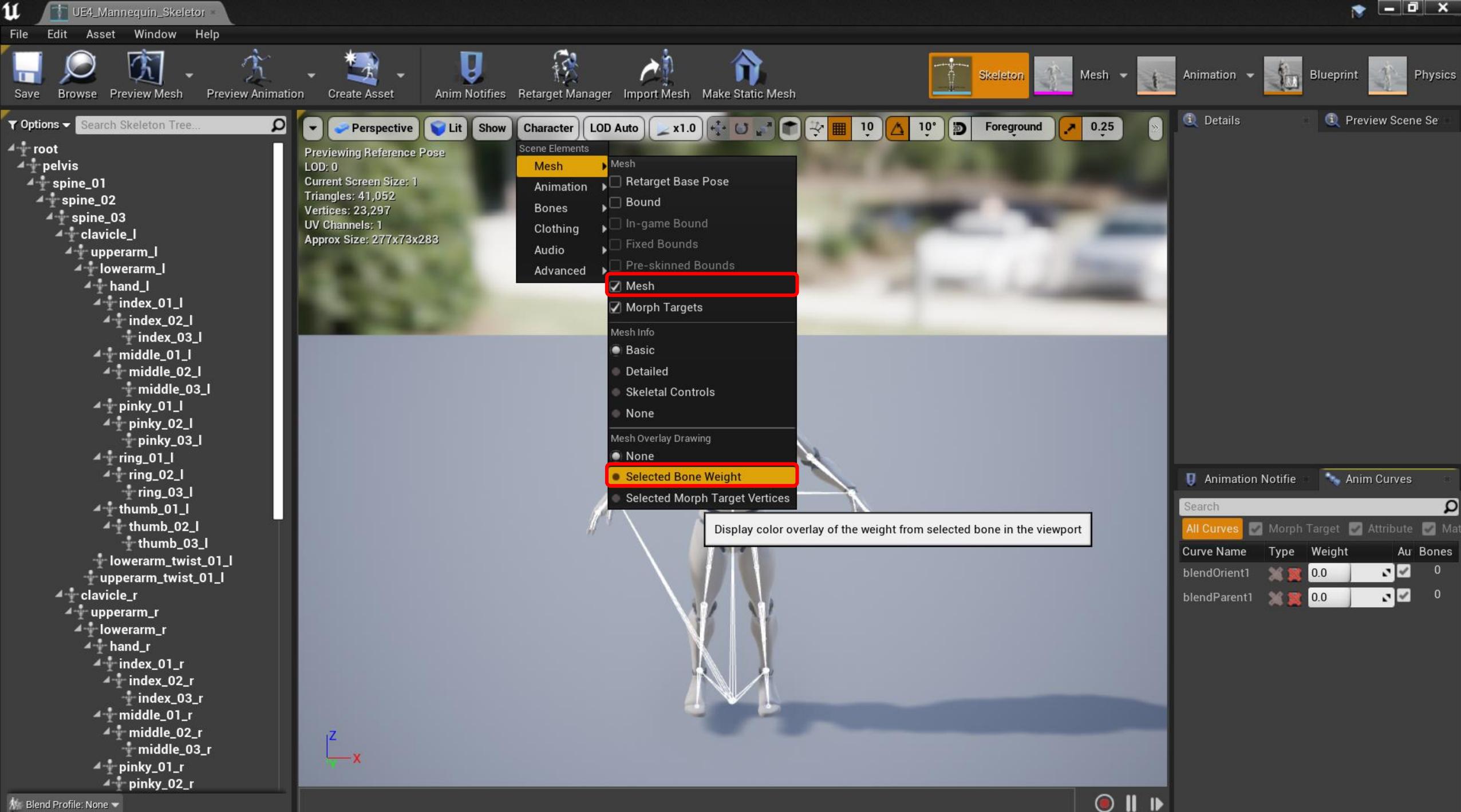


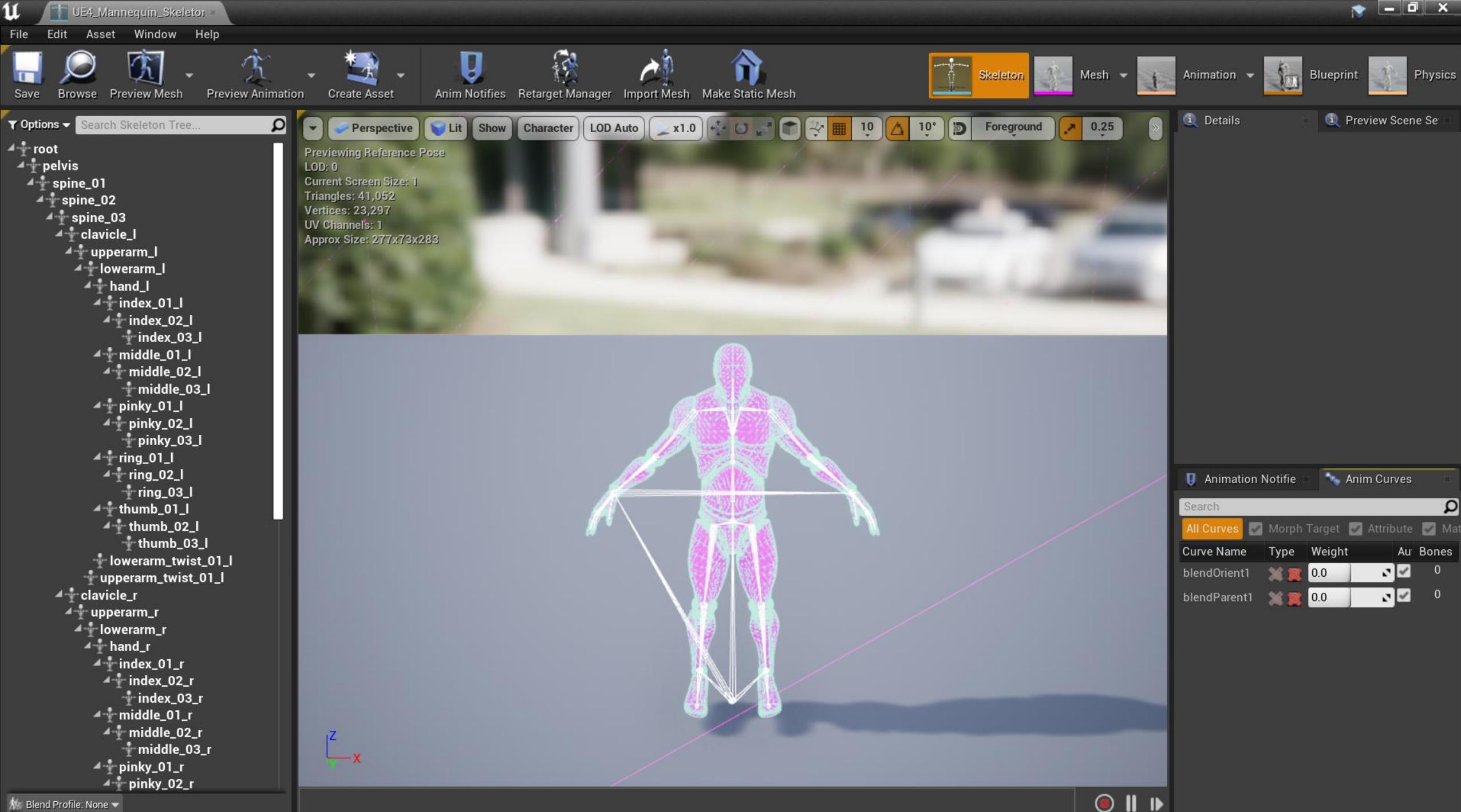


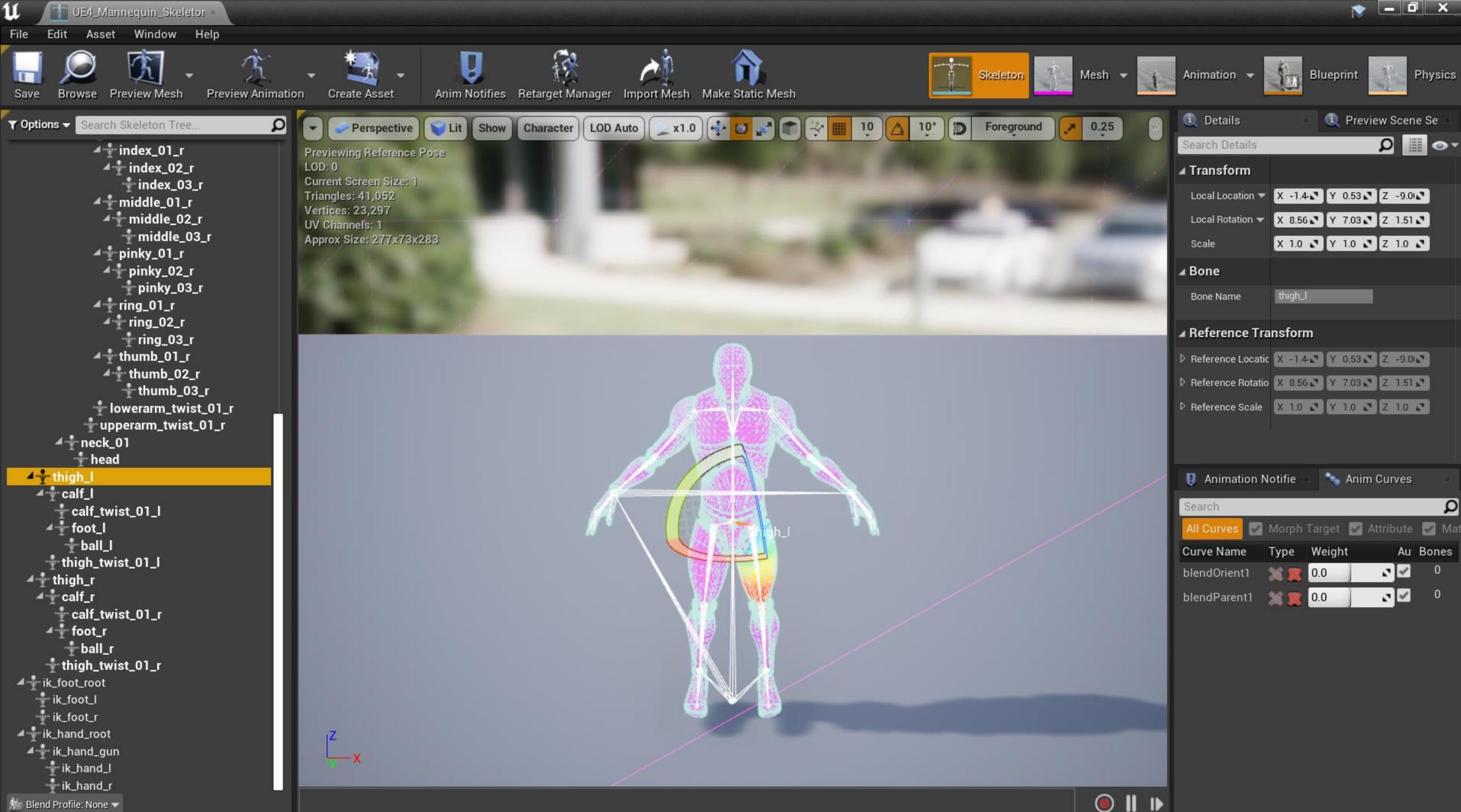




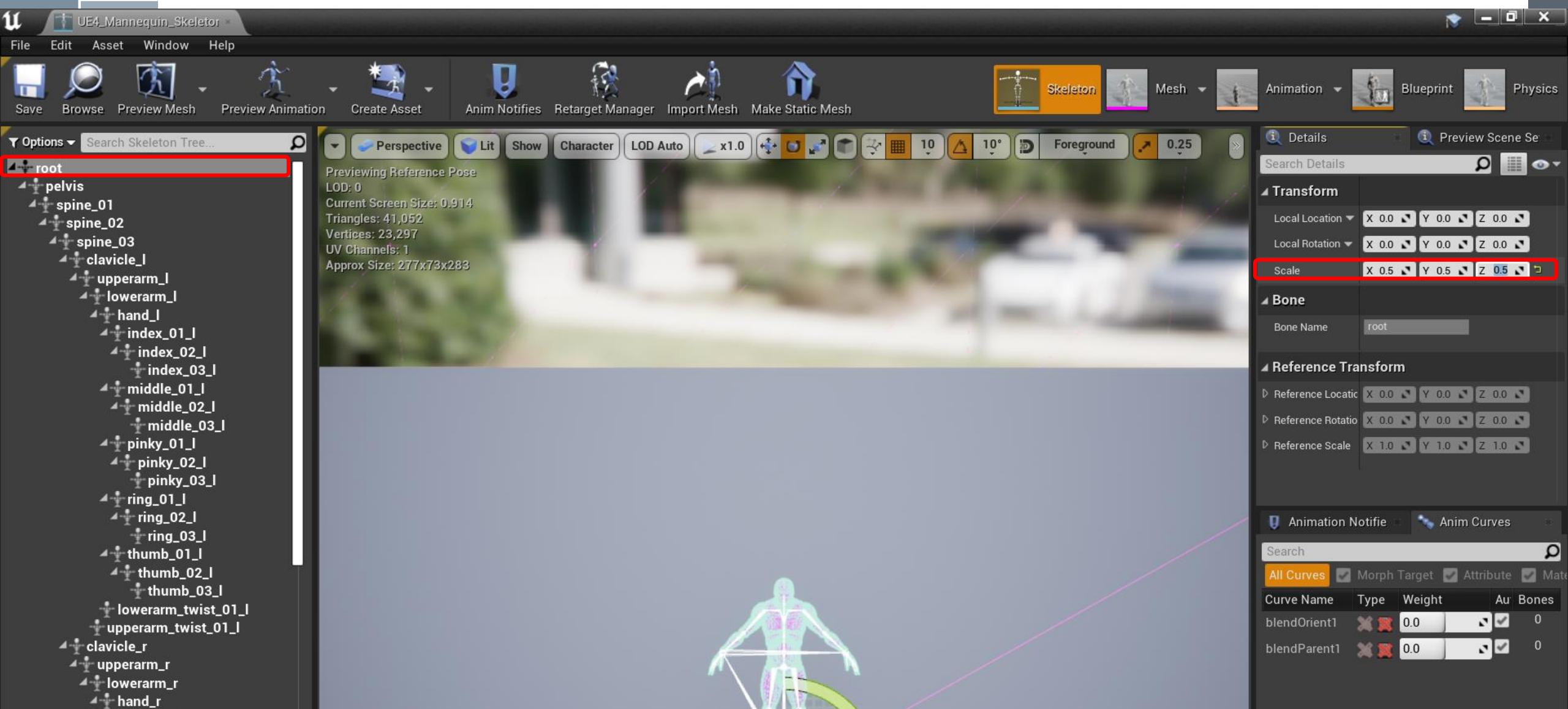


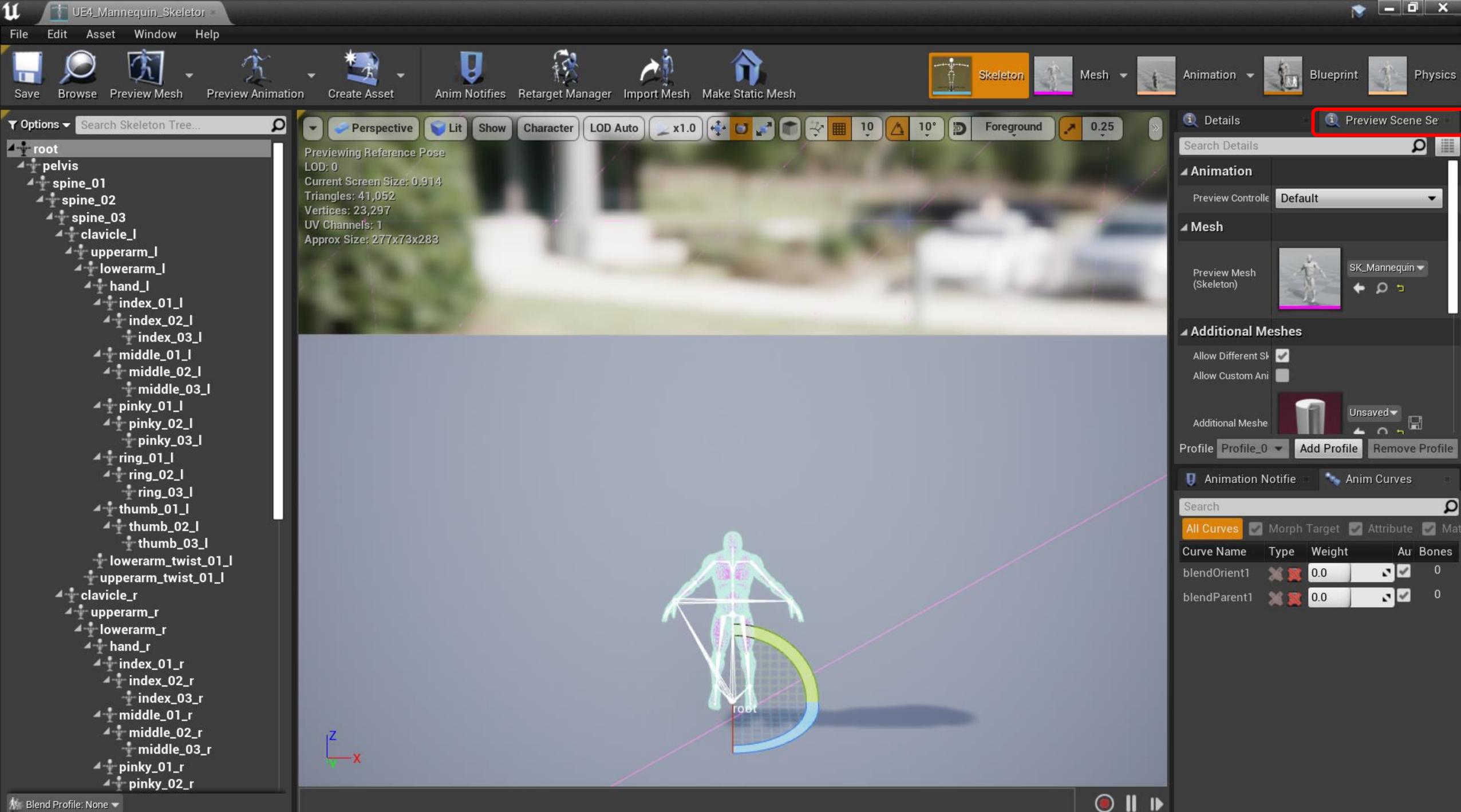


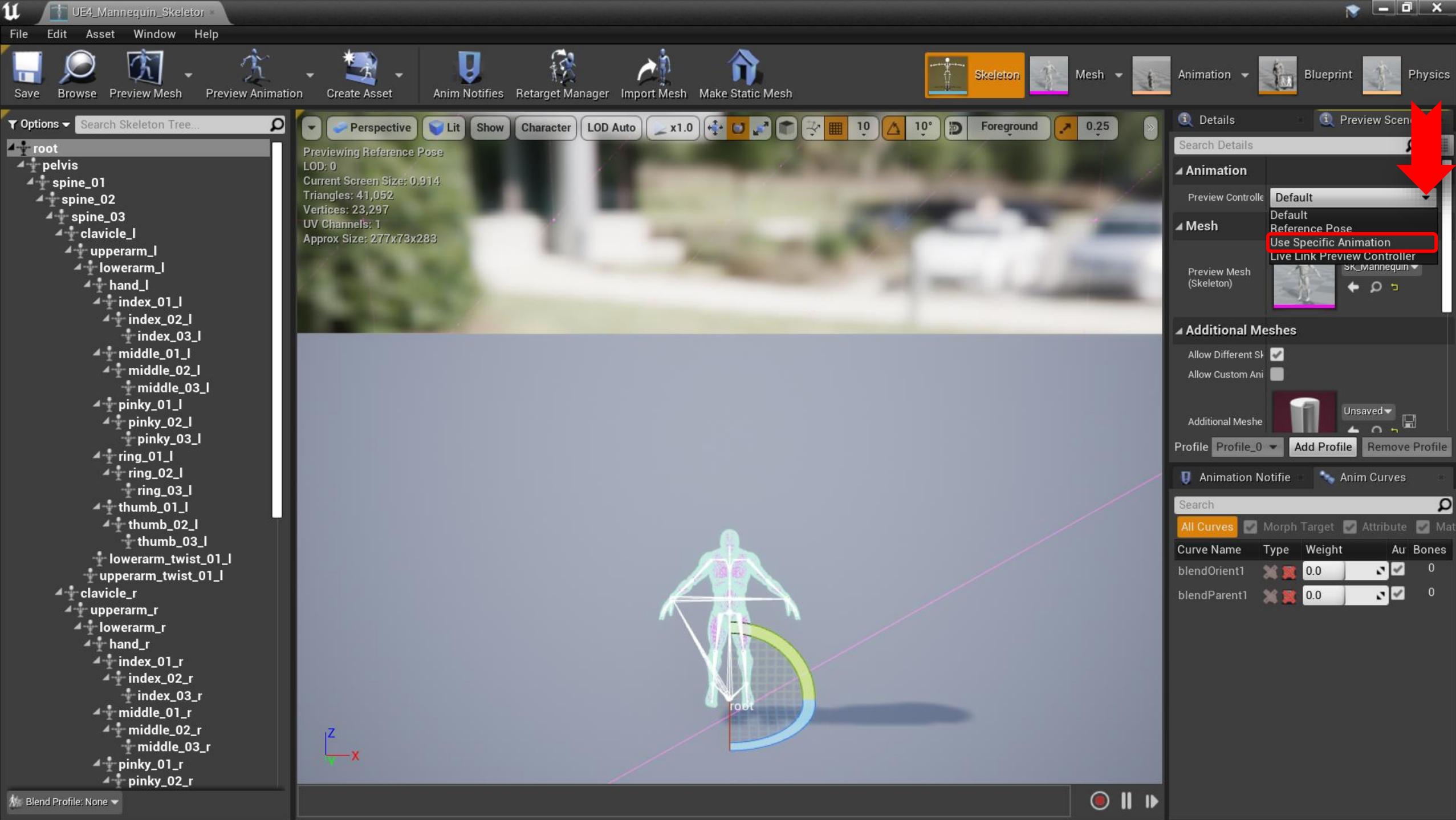


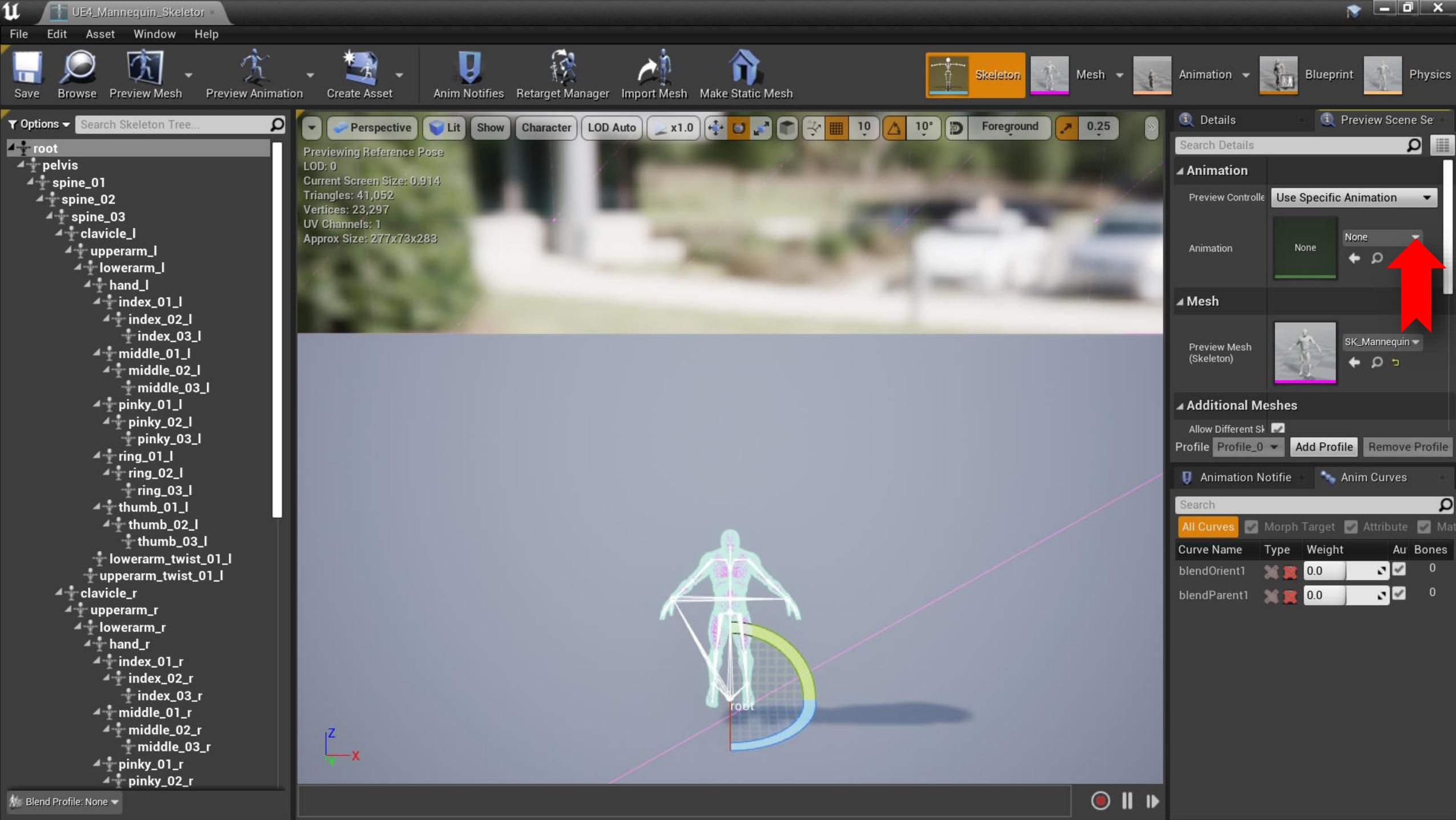


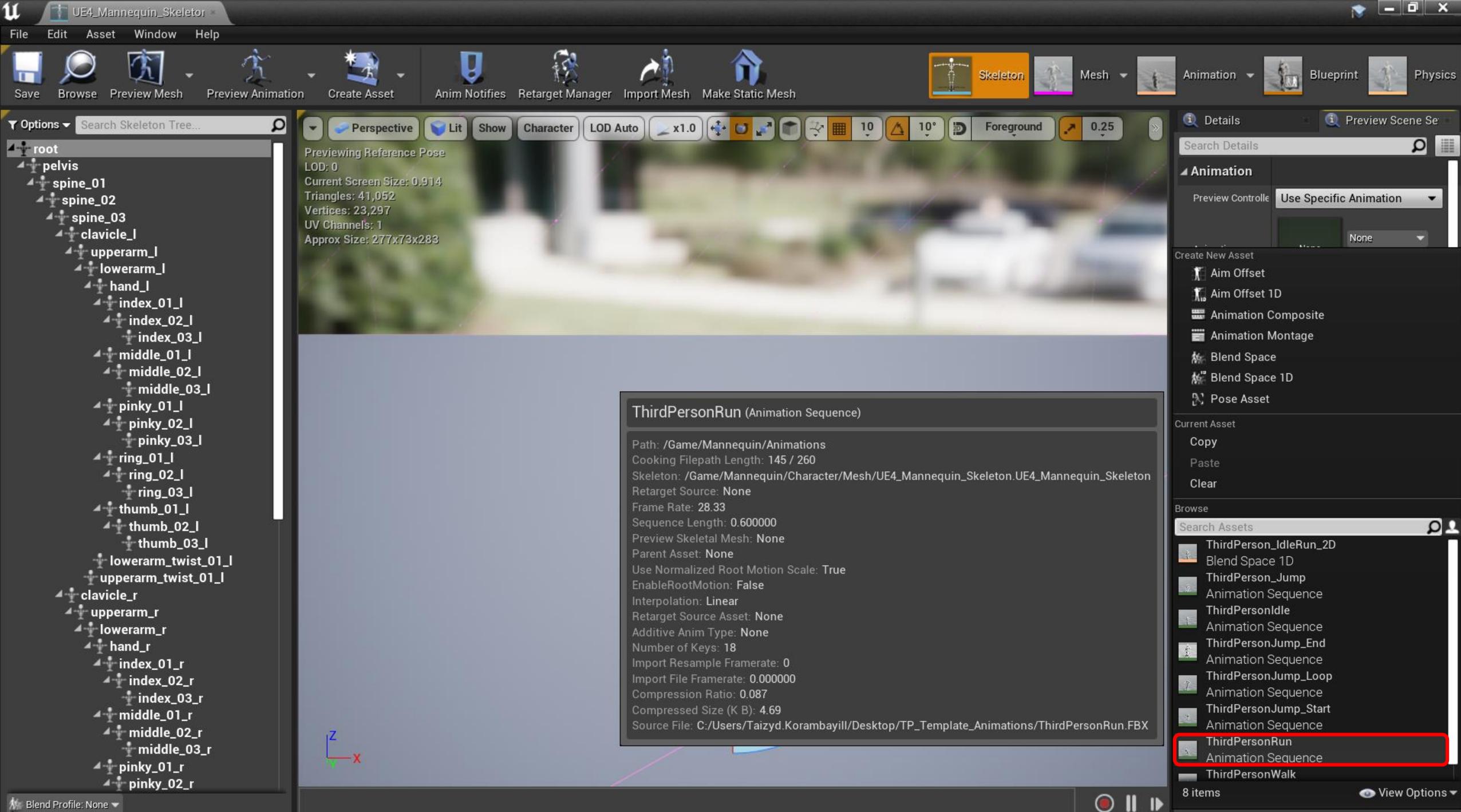
Activity 10.02: Skeletal Bone Manipulation and Animations

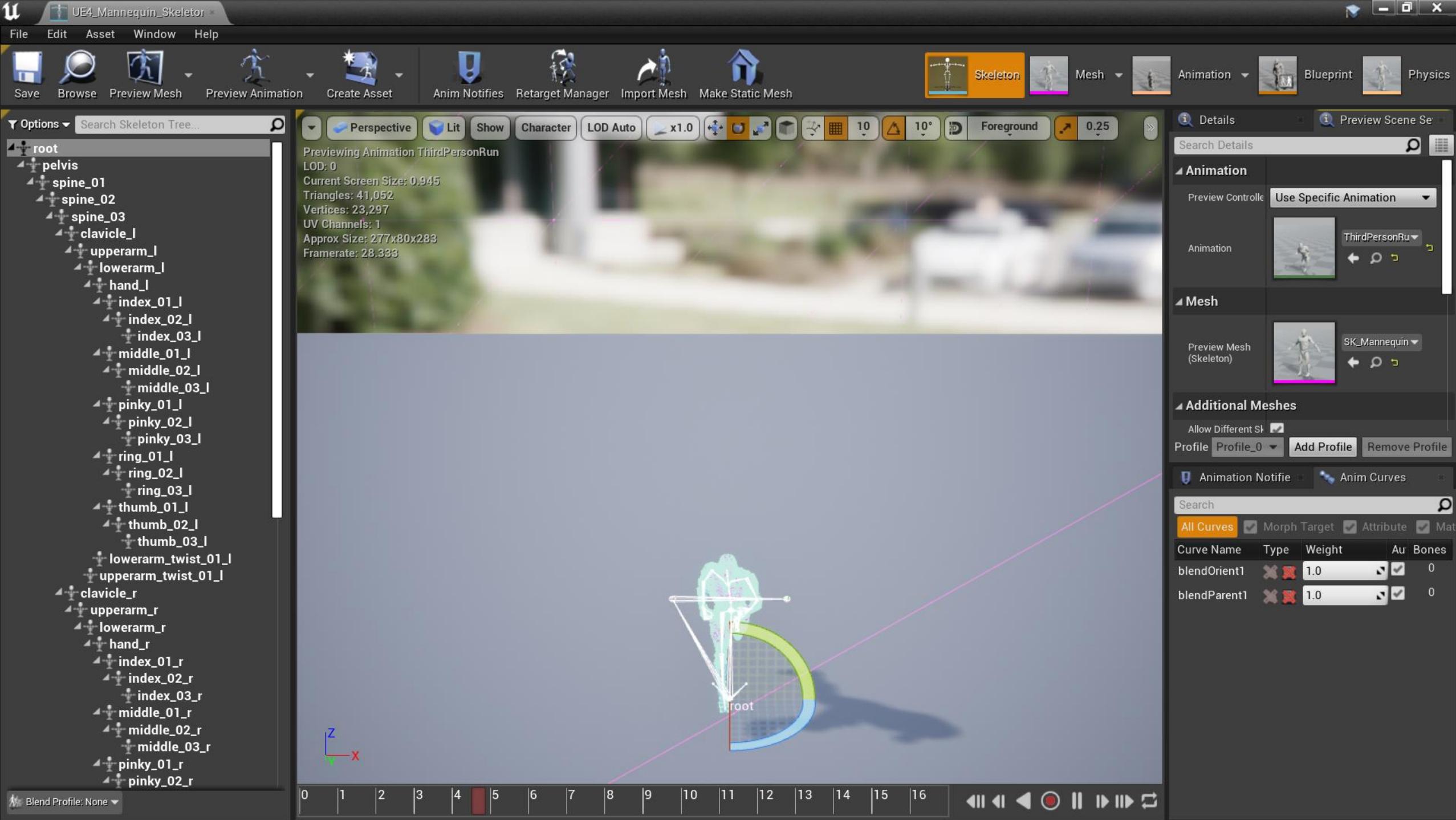














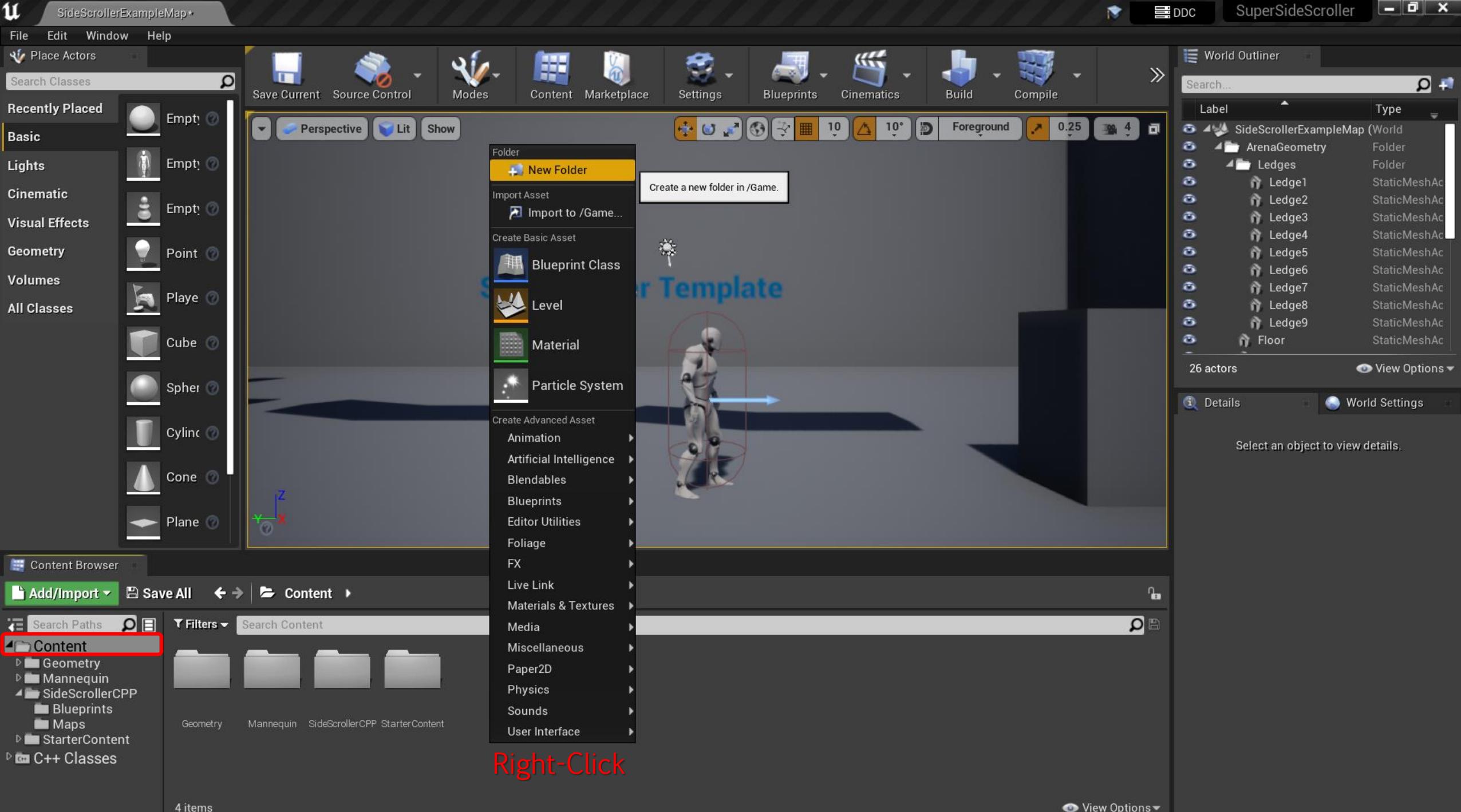
Animations in Unreal Engine 4

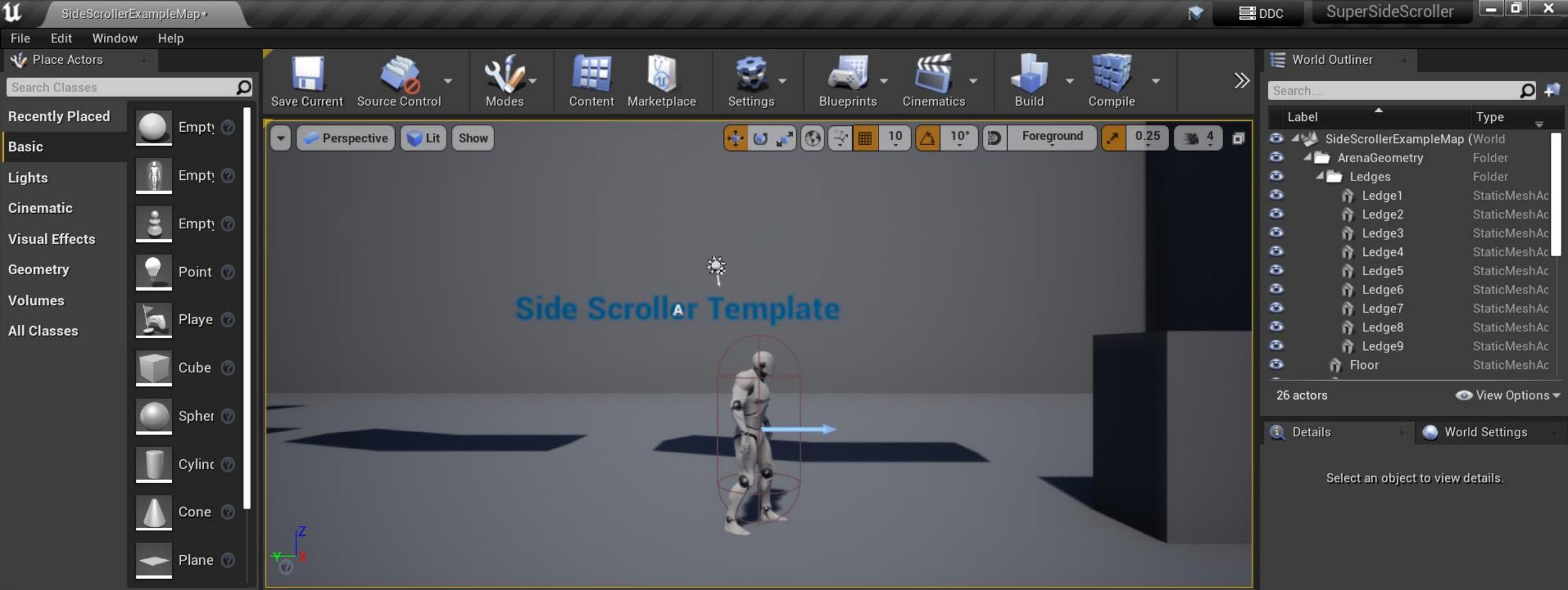
- › Skeletons
 - Once the Skeleton is in the engine, we can view the skeleton hierarchy, manipulate each individual bone, and add objects known as sockets. (e.g. In FPS, typically a weapon socket)
- › Skeletal Meshes
 - The main difference between a Static Mesh and a Skeletal Mesh is that Skeletal Meshes are required for objects that use animations.
- › Animation Sequences
 - An animation sequence is an individual animation that can be played on a specific Skeletal Mesh.

Exercise 10.03: Importing and Setting Up the Character and Animation

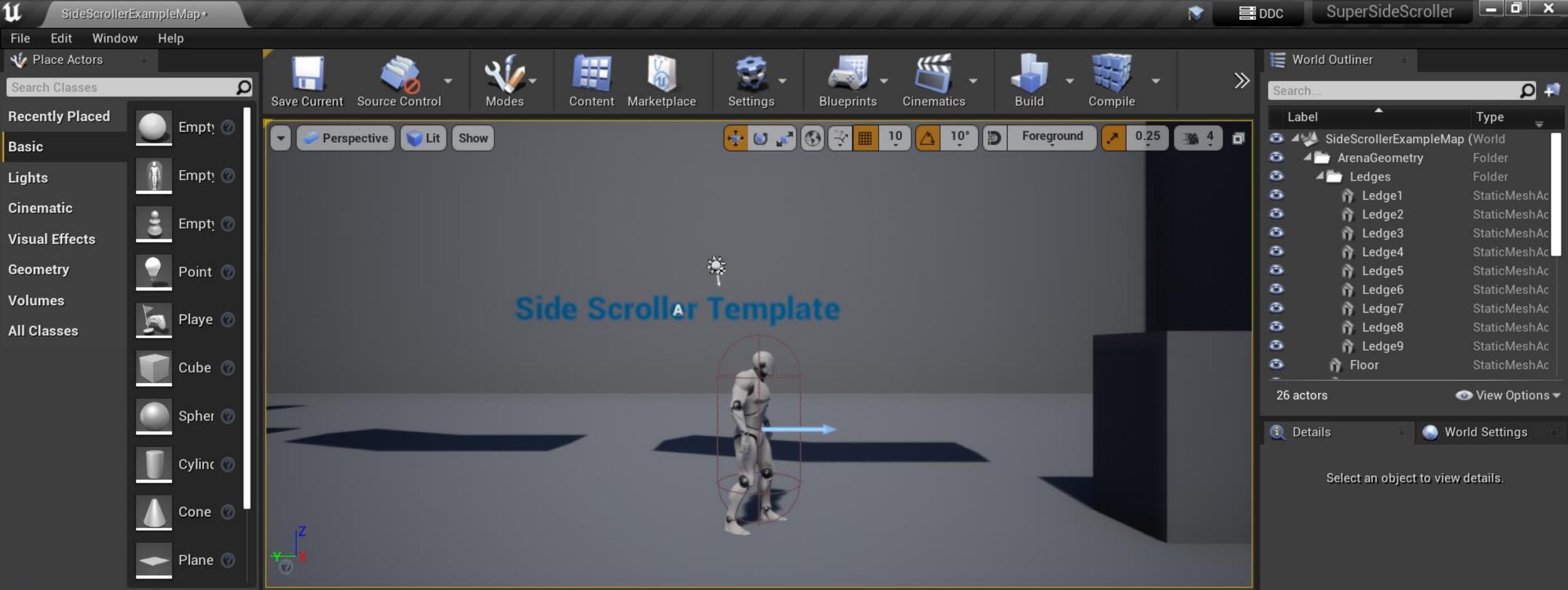


The screenshot shows the Unreal Engine Asset Browser interface. The title bar displays "SideScrollerProject_Assets". The menu bar includes "파일" (File), "홈" (Home), "공유" (Share), and "보기" (View). The toolbar contains various icons for file operations like剪切 (Cut), 复制 (Copy), 粘贴 (Paste), and 删除 (Delete). The ribbon tabs include "클립보드" (Clipboard), "구성" (Configure), "새 폴더" (New Folder), "선택" (Select), and "열기" (Open). The navigation bar shows the path: Unreal > SideScrollerProject_Assets. The left sidebar lists file types: 즐겨찾기 (Favorites), 바탕 화면 (Desktop), 다운로드 (Downloads), 문서 (Documents), 사진 (Photos), 동영상 (Videos), 음악 (Music), and OneDrive - Personal. The main content area shows two selected items: "Animations" and "Character Mesh".





This screenshot shows the Content Browser panel from the Unreal Engine 4 Editor. The top bar includes "Add/Import", "Save All", and "Content" buttons. The main area displays the "Content" folder structure under "Filters". A folder named "MainCharacter" is highlighted with a red box. The bottom status bar indicates "5 items (1 selected)" and "View Options".



The Content Browser window shows the file structure for the "MainCharacter" asset. The "Content" folder contains "Geometry", "MainCharacter" (which is expanded to show "Animation" and "Mesh" subfolders), "Mannequin", "SideScrollerCPP" (expanded to show "Blueprints" and "Maps" subfolders), and "StarterContent". The "Animation" and "Mesh" subfolders under "MainCharacter" are highlighted with a yellow box and circled with a red line. The status bar at the bottom indicates "2 items (2 selected)" and "View Options".

SideScrollerExampleMap* DDC SuperSideScroller

File Edit Window Help

Place Actors Search Classes

Save Current Source Control Modes Content Marketplace Settings Blueprints Cinematics Build Compile

Recently Placed Basic Lights Cinematic Visual Effects Geometry Volumes All Classes

Empty Empty Empty Point Play Cube Sphere Cylinder Cone Plane

Content Browser Add/Import Save All

Content Paths Filters

MainCharacter Mesh Mannequin SideScrollerCPP Blueprints Maps StarterContent C++ Classes

0 items

Import Asset Import to /Game/MainCharacter/Mesh... Create Basic Asset Blueprint Class Level Material Particle System Create Advanced Asset Animation Artificial Intelligence Blendables Blueprints Editor Utilities Foliage FX Live Link Materials & Textures Media Miscellaneous Paper2D Physics Sounds User Interface Mesh

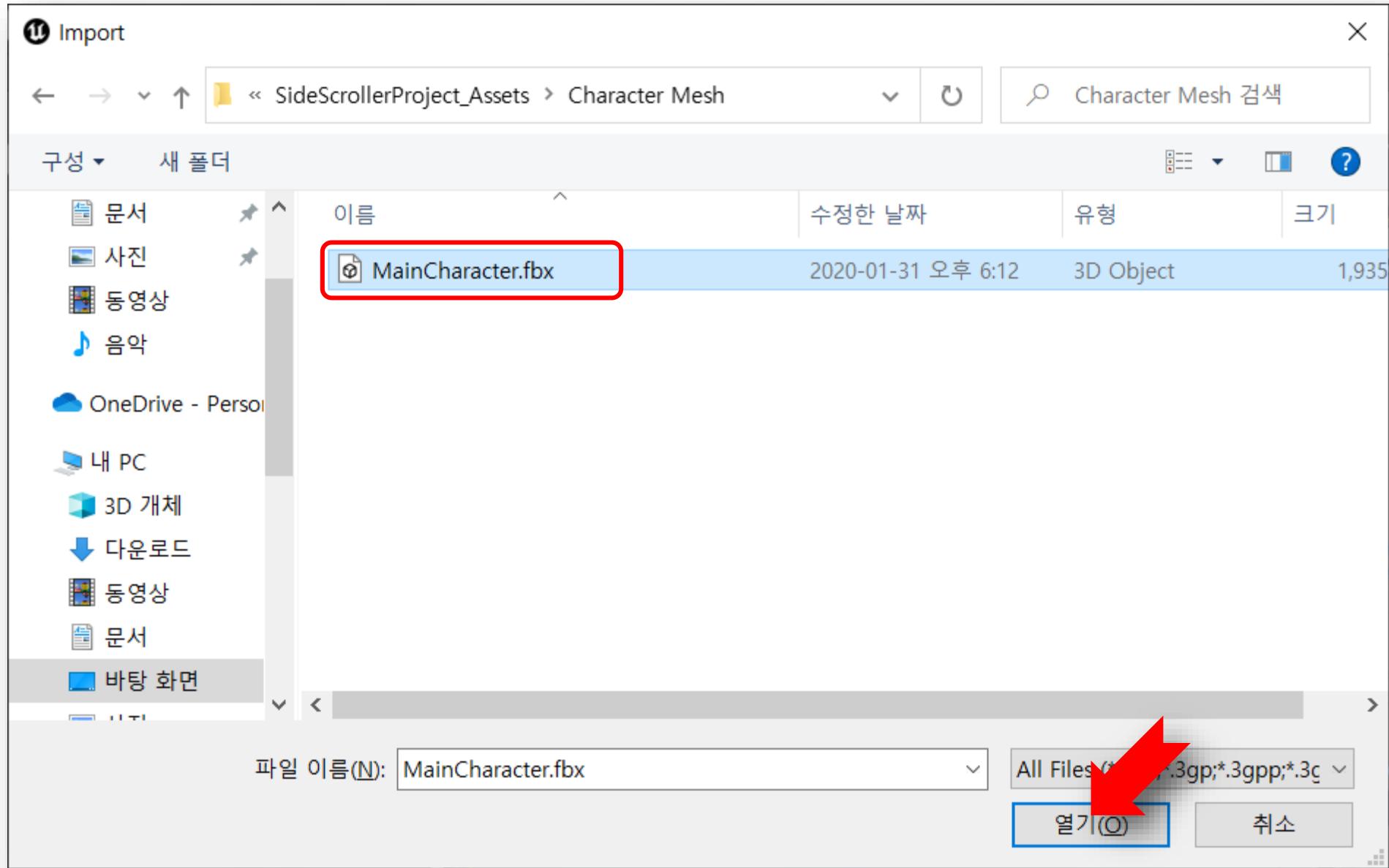
Drop files here or right click to create content.

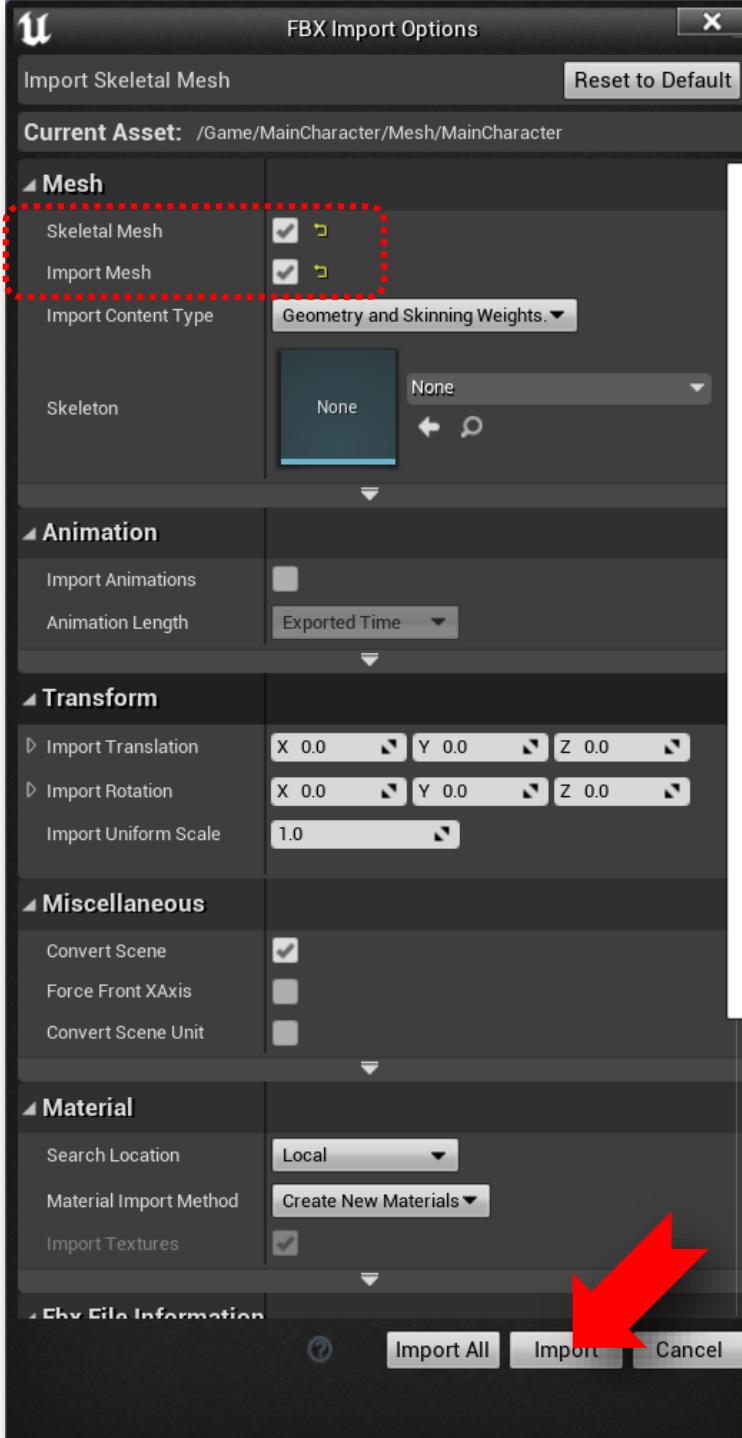
World Outliner Search... Label Type

- SideScrollerExampleMap (World)
 - ArenaGeometry
 - Ledges
 - Ledge1
 - Ledge2
 - Ledge3
 - Ledge4
 - Ledge5
 - Ledge6
 - Ledge7
 - Ledge8
 - Ledge9
 - Floor

Foreground 0.25 4 10 10° 26 actors View Options Details World Settings Select an object to view details.

Right-Click







Message Log

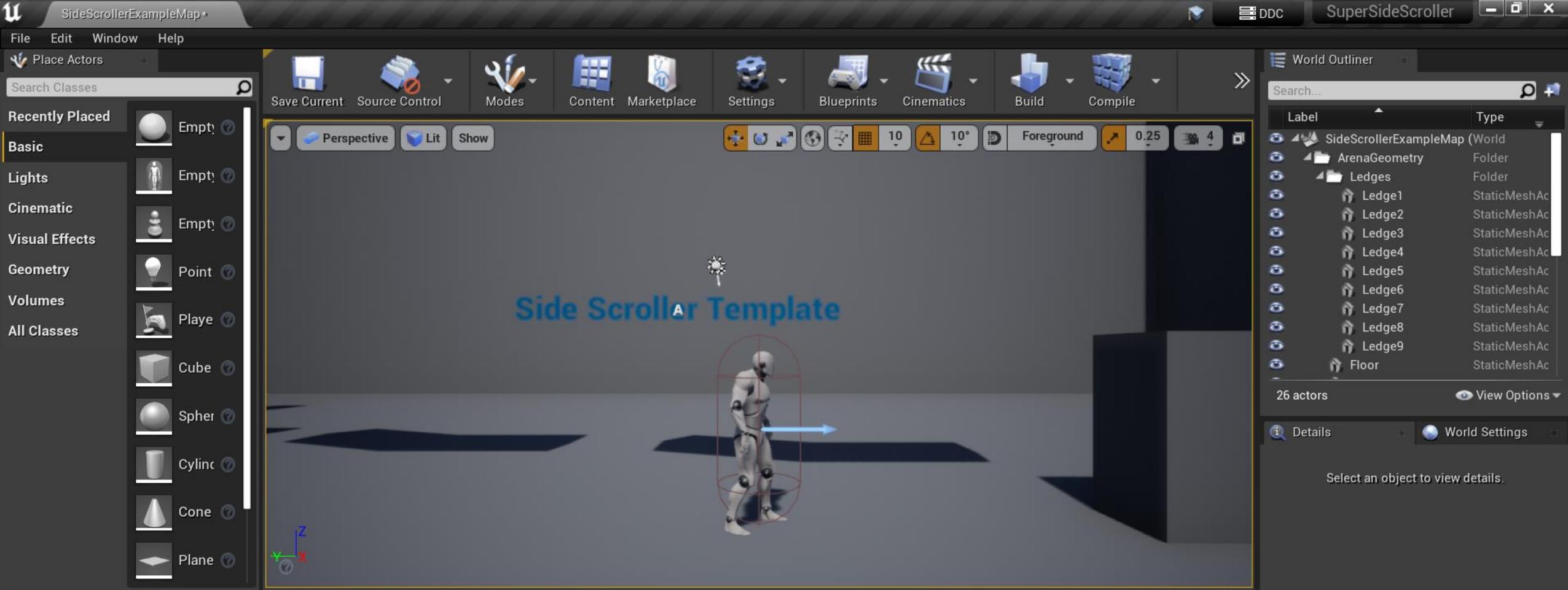


- Asset Tools
- Build and Submit Errors
- LiveLink
- Source Control (6)
- Blueprint Log
- Play In Editor (2)
- Anim Blueprint Log
- Automation Testing Log
- Localization Service (1)
- Insights Log
- Asset Reimport
- Lighting Results
- Map Check (1)
- Load Errors
- Editor Errors
- Packaging Results
- Asset Check
- Slate Style Log
- HLOD Results
- Compiler Log
- FBX Import (2)**
- UDN Parse Errors

! No smoothing group information was found in this FBX scene. Please make sure to enable the 'Export Smooth' option in the FBX export settings.
The following bones are missing from the bind pose:
mixamorig:HeadTop_End
mixamorig:LeftEye
mixamorig:RightEye
mixamorig:LeftHandThumb4
mixamorig:LeftHandIndex4
mixamorig:LeftHandMiddle4
mixamorig:LeftHandRing4
mixamorig:LeftHandPinky4
mixamorig:RightHandPinky4
mixamorig:RightHandRing4
mixamorig:RightHandMiddle4
mixamorig:RightHandIndex4
mixamorig:RightHandThumb4
mixamorig:LeftToe_End
mixamorig:RightToe_End

This can happen for bones that are not vert weighted. If they are not in the correct orientation after import, please set the "Use T0 as ref pose" option or add them to the bind pose and reimport the skeletal mesh.

Clear



Add/Import ▾ Save All ↻ ↽ Content ▸ MainCharacter ▸ Mesh

Content Browser

Content

- Geometry
- MainCharacter
 - Animation
 - Mesh
- Mannequin
- SideScrollerCPP
 - Blueprints
 - Maps
- StarterContent
- C++ Classes

5 items

Search Paths

Filters ▾

Search Mesh

- Beta_High_LimbsGeoSG2_MAT
- MainCharacter_Mesh
- MainCharacter_Animation
- MainCharacter_Skeleton

View Options ▾

SideScrollerExampleMap* DDC SuperSideScroller

File Edit Window Help

Place Actors Search Classes

Save Current Source Control Modes Content Marketplace Settings Blueprints Cinematics Build Compile

Recently Placed Basic Lights Cinematic Visual Effects Geometry Volumes All Classes

Empty Empty Empty Point Play Cube Sphere Cylinder Cone Plane

Content Browser Add/Import Save All Content Paths Filters

Content Geometry MainCharacter Animation Mesh Mannequin SideScrollerCPP Blueprints Maps StarterContent C++ Classes

0 items

Import Asset Import to /Game/MainCharacter/Animation... Create Basic Asset Blueprint Class Level Material Particle System Create Advanced Asset Animation Artificial Intelligence Blendables Blueprints Editor Utilities Foliage FX Live Link Materials & Textures Media Miscellaneous Paper2D Physics Sounds User Interface

Imports an asset from file to this folder.

Side Scroller Template

Right-Click

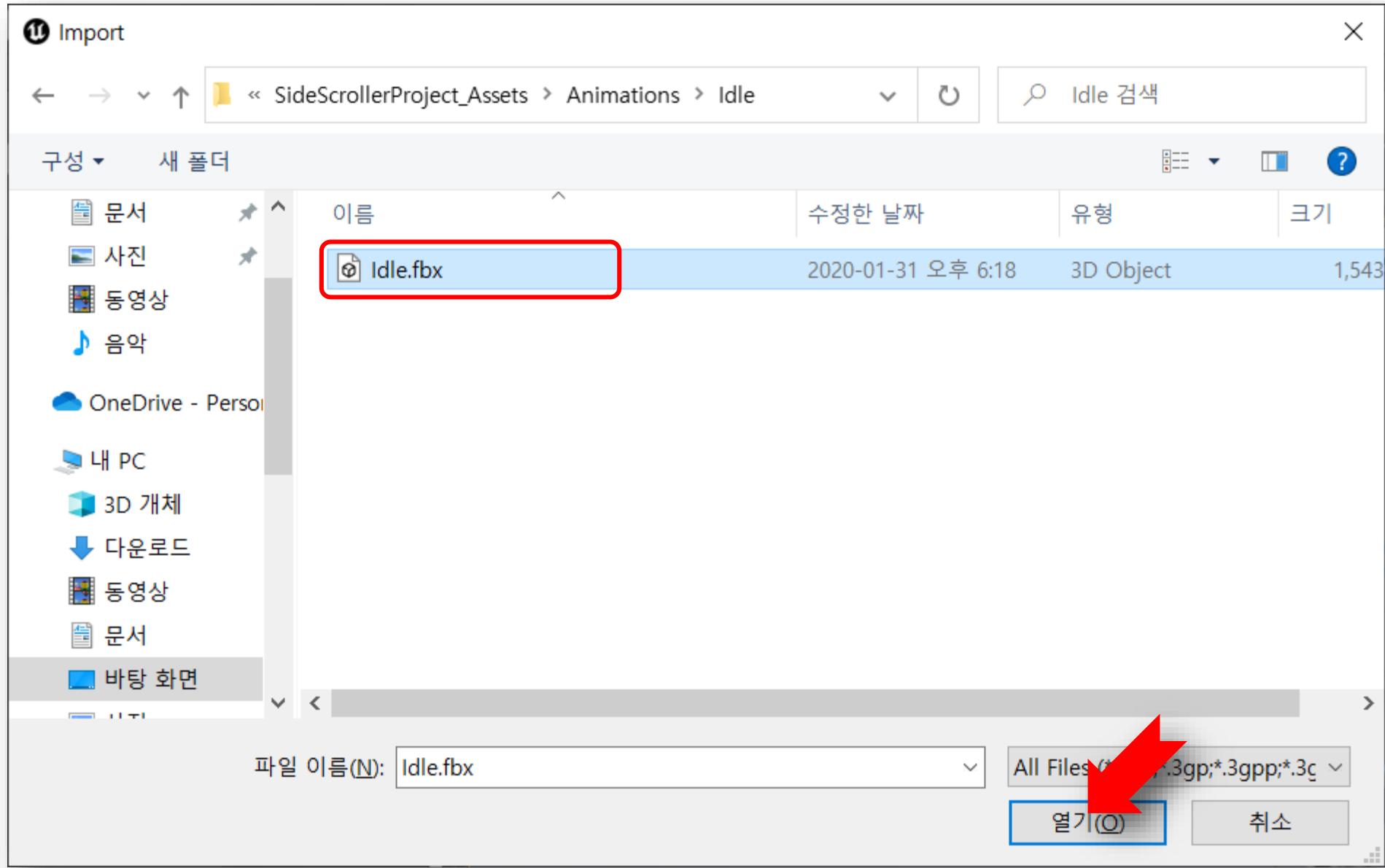
Drop files here or right click to create content.

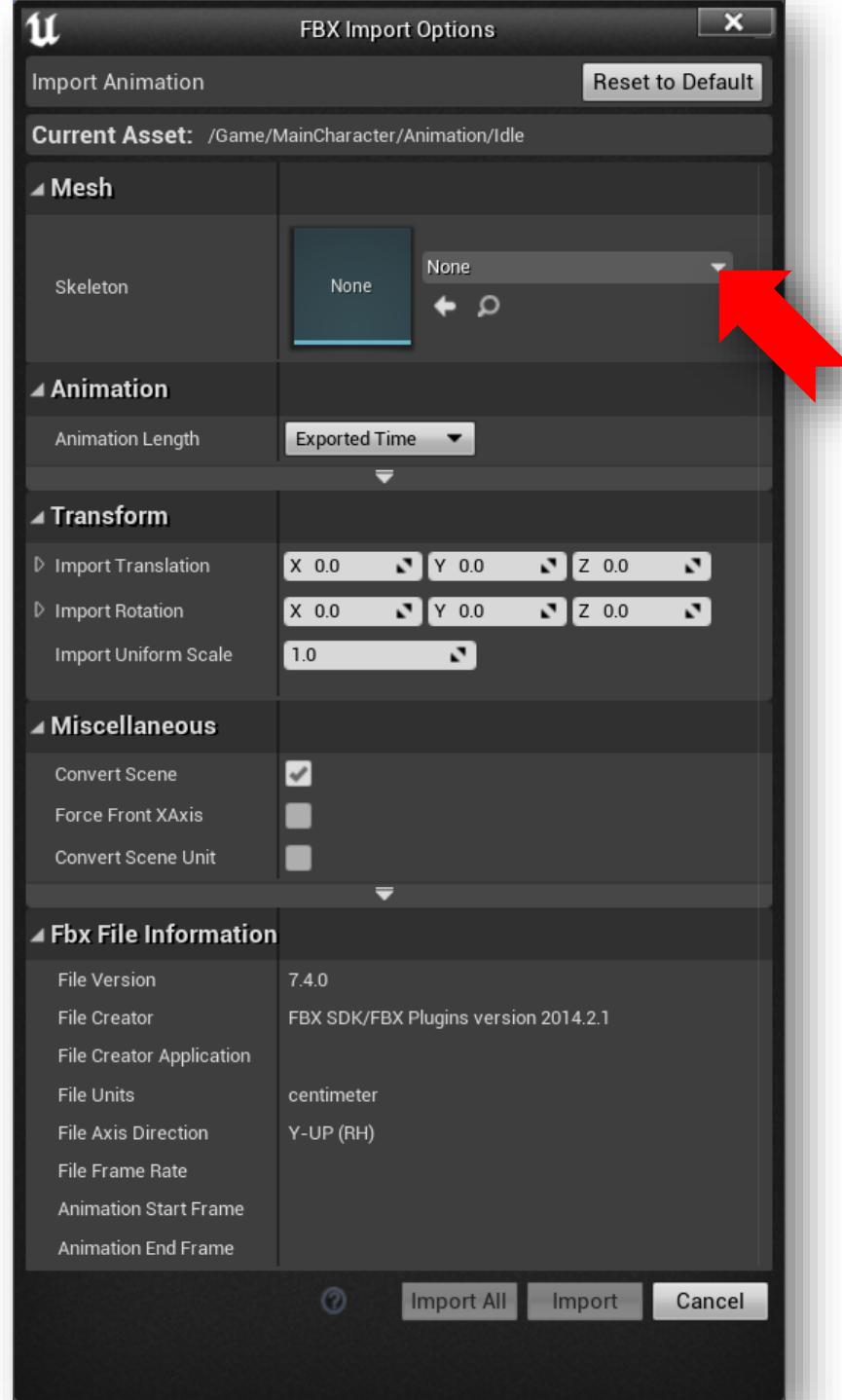
World Outliner Search... Label Type

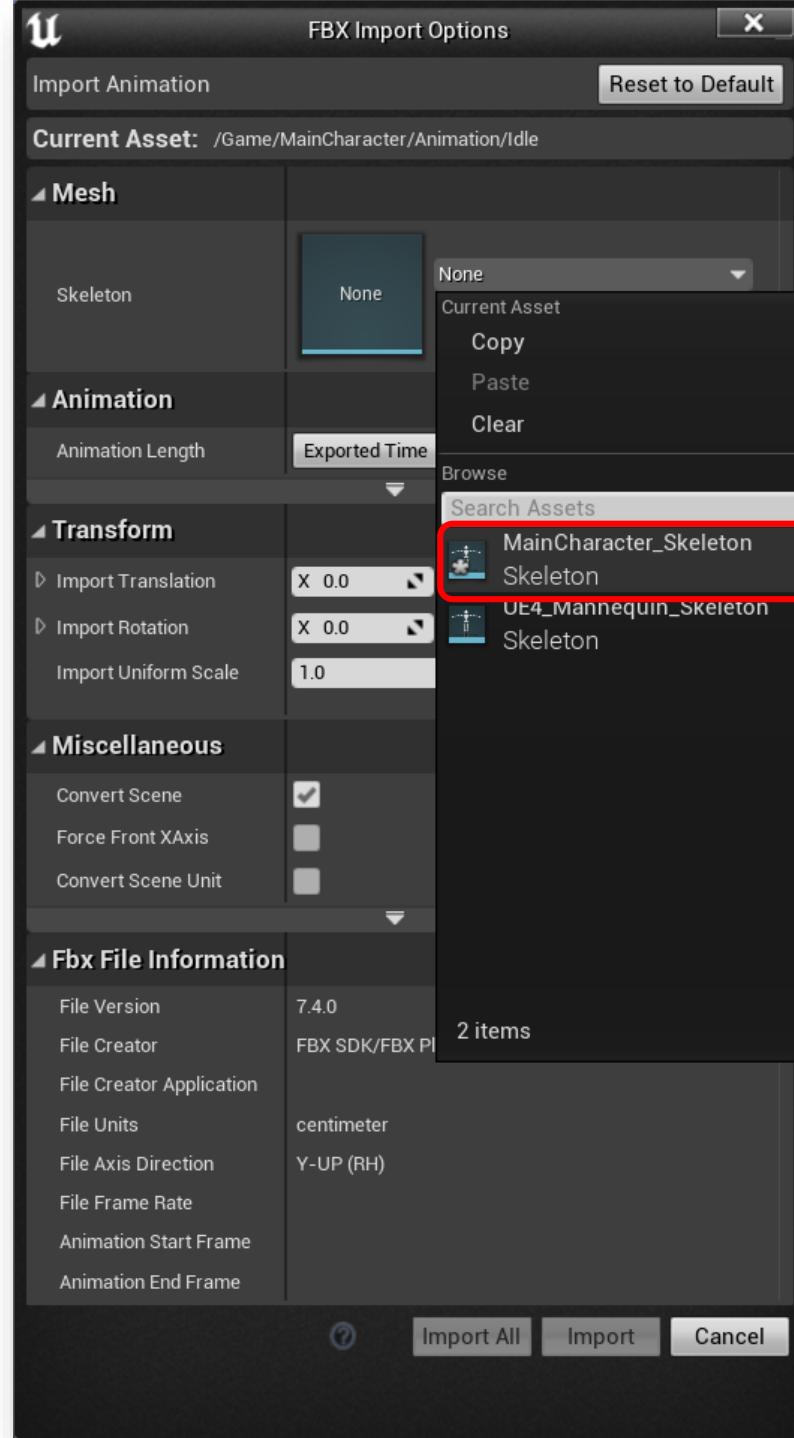
- SideScrollerExampleMap (World)
 - ArenaGeometry
 - Ledges
 - Ledge1
 - Ledge2
 - Ledge3
 - Ledge4
 - Ledge5
 - Ledge6
 - Ledge7
 - Ledge8
 - Ledge9
 - Floor

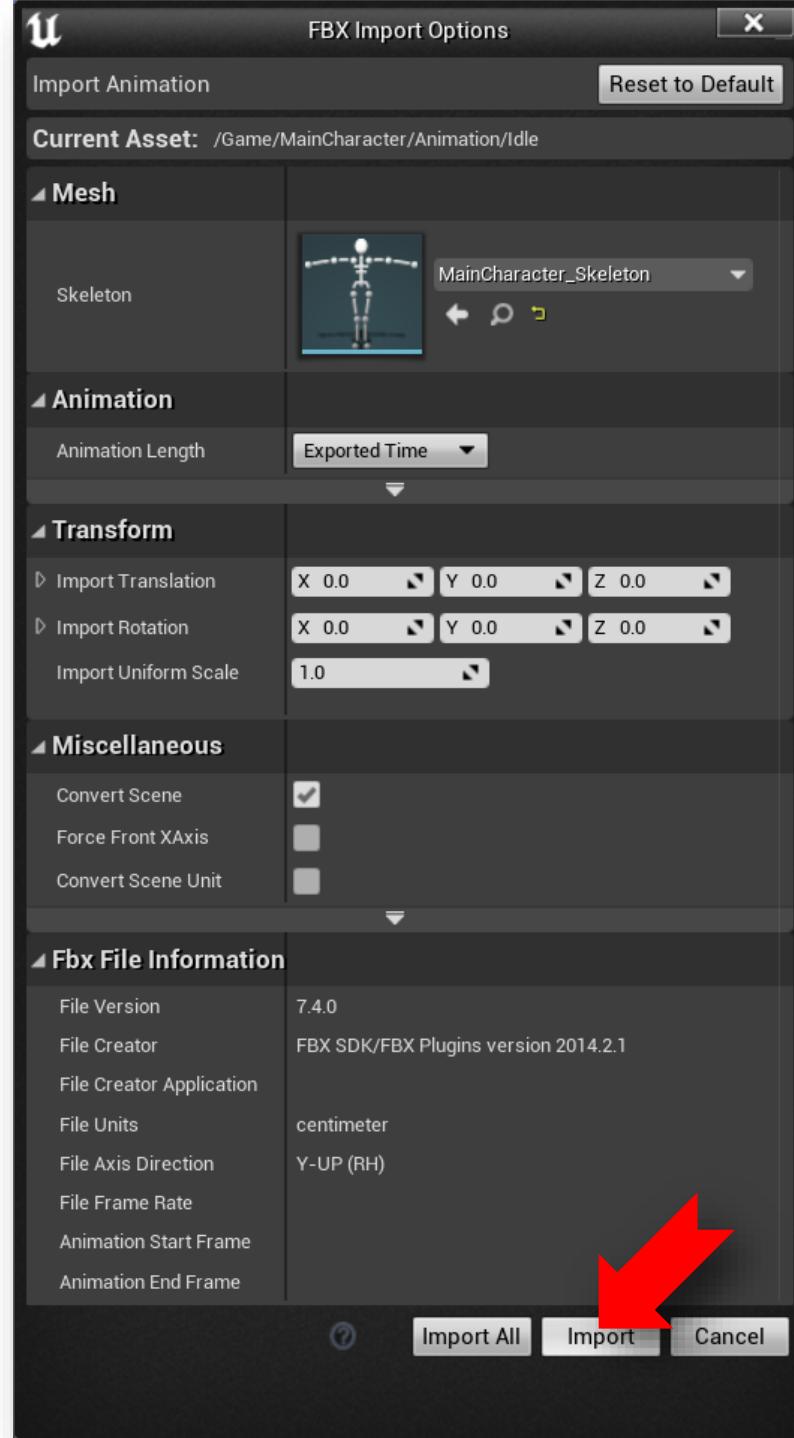
26 actors View Options

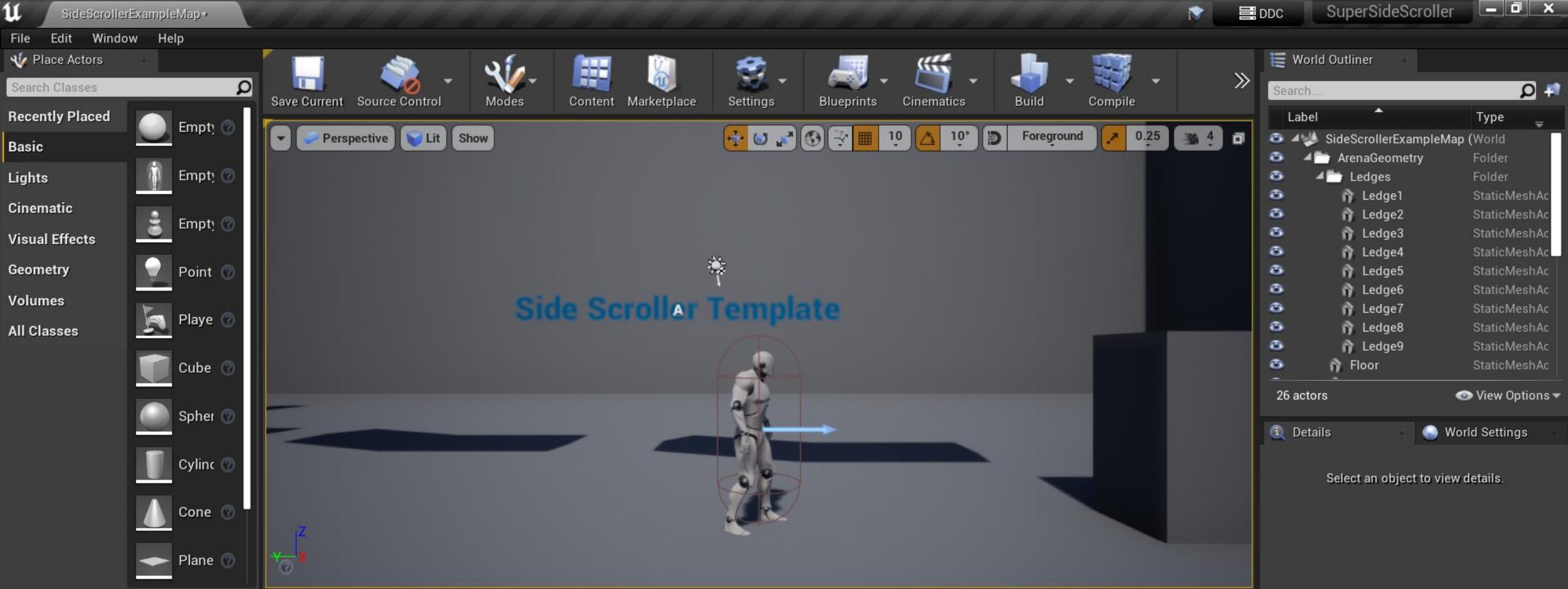
Details World Settings Select an object to view details.







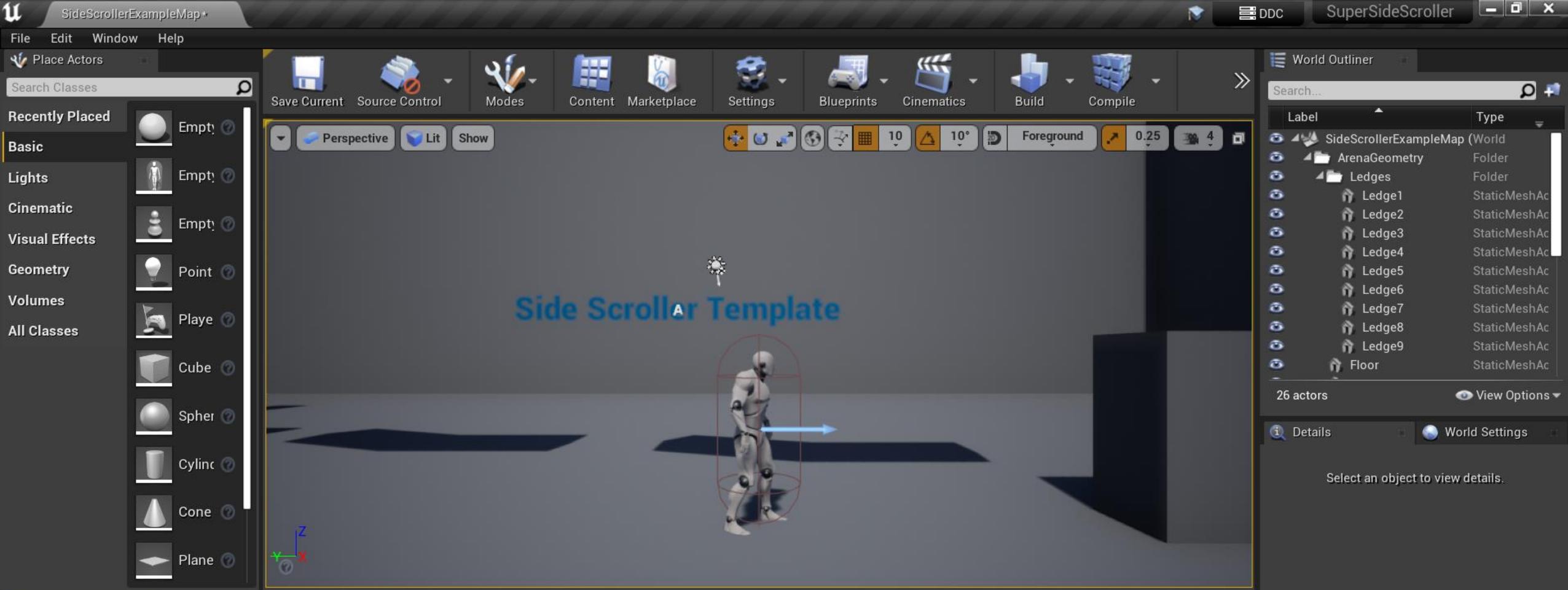




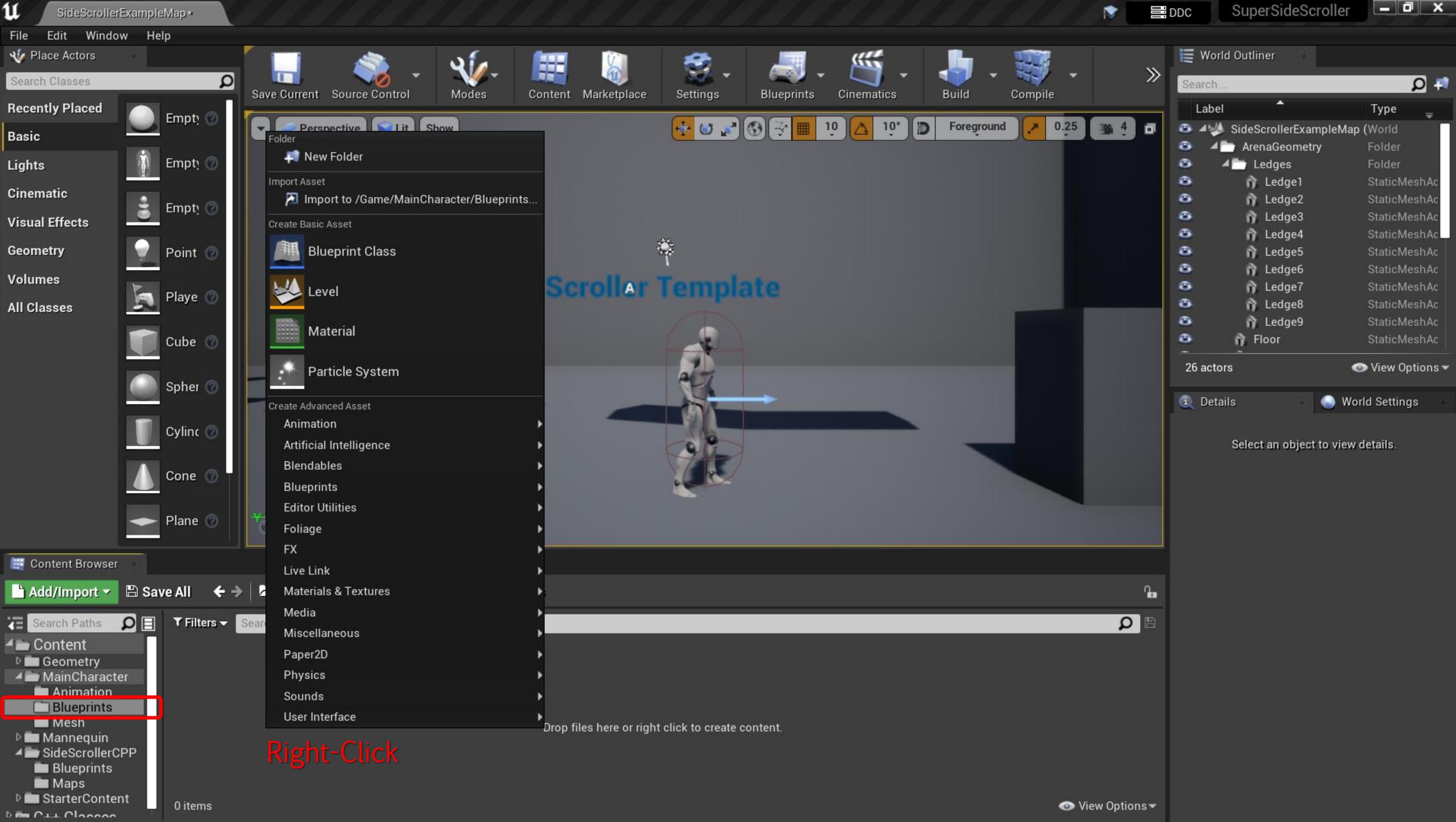
The Content Browser panel at the bottom shows the file structure under "Content":

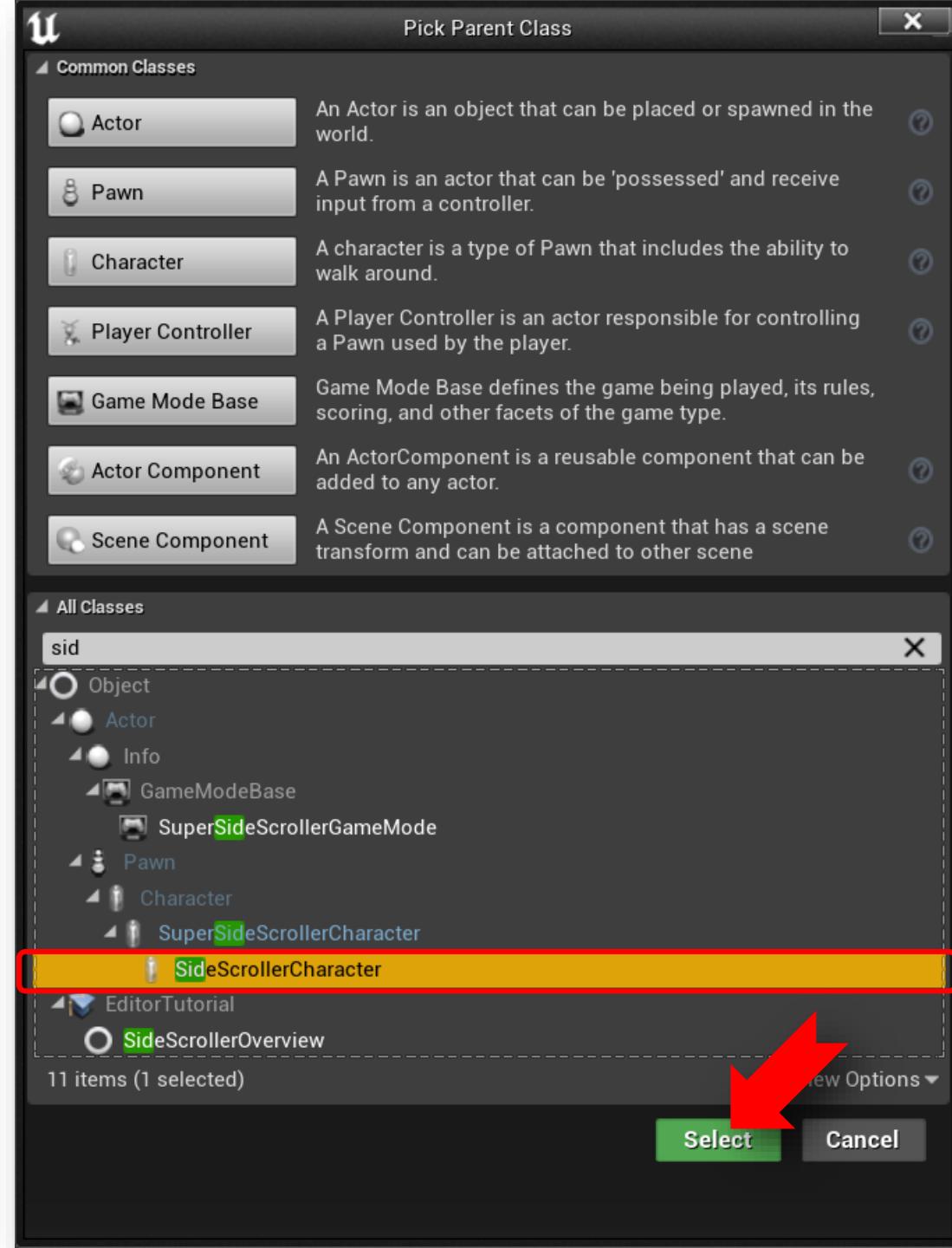
- Content
 - Geometry
 - MainCharacter
 - Animation
 - Mesh
 - Mannequin
 - SideScrollerCPP
 - Blueprints
 - Maps
 - StarterContent
- C++ Classes

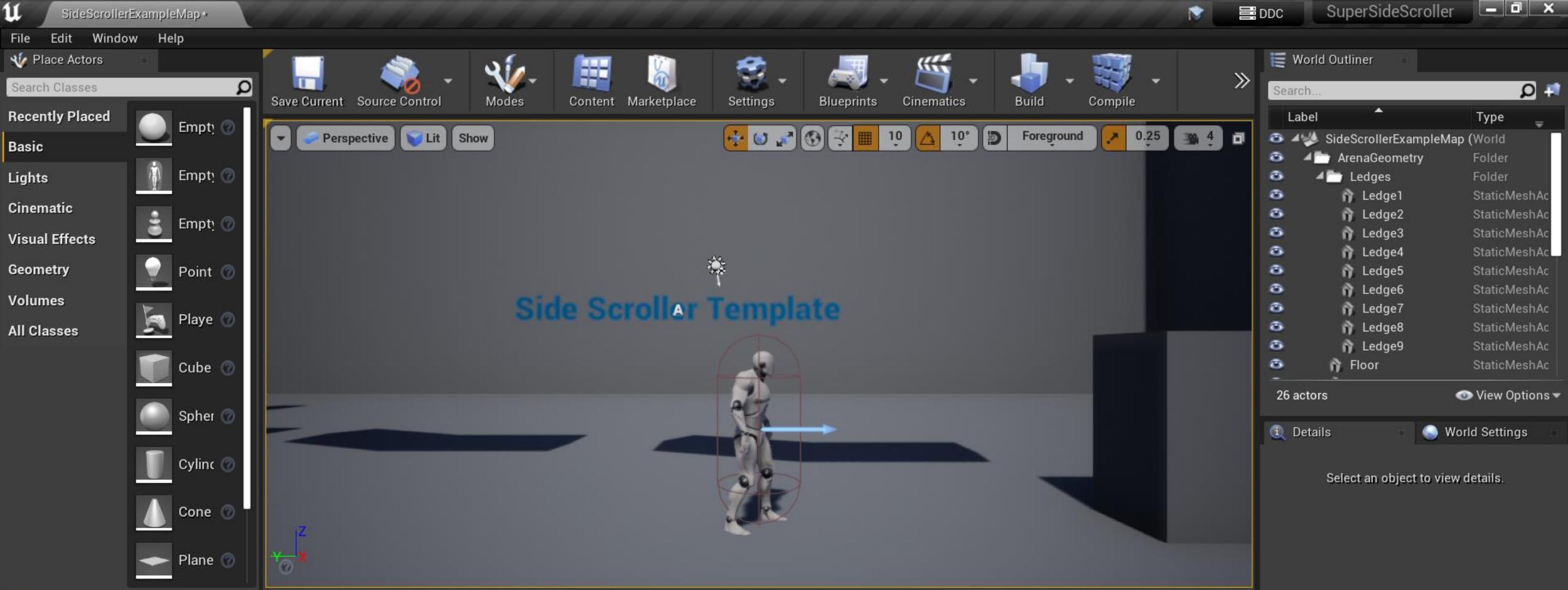
The "MainCharacter\Animation" folder is selected, and its contents are listed in the center pane, showing a preview of the "Idle" animation.



The Content Browser window is open, showing the file structure under 'Content'. A folder named 'MainCharacter' is selected. Inside 'MainCharacter', there are sub-folders for 'Animation', 'Blueprints', and 'Mesh'. The 'Blueprints' folder is highlighted with a red box. The search bar at the top of the Content Browser says 'Search MainCharacter'. The status bar at the bottom indicates '3 items (1 selected)'.







This screenshot shows the Content Browser panel of the Unreal Engine Editor. The left sidebar displays the project structure: Content > MainCharacter > Blueprints. A single item, 'BP_SuperSideScroller_MainCharacter', is selected and highlighted with a red border. The right side of the panel shows the details for this selected Blueprint, including its thumbnail image and name.

SideScrollerExampleMap* DDC SuperSideScroller

File Edit Window Help

Place Actors Search Classes

Recently Placed Basic Lights Cinematic Visual Effects Geometry Volumes All Classes

Content Browser Add/Import Save All Filters Search

Content Geometry MainCharacter Animation Blueprints (highlighted with a red box)

BP_SuperSide Scroller_Main Character

1 item

Save Current Source Control Modes Content Marketplace Settings Blueprints Cinematics Build Compile

World Outliner Search... Label Type

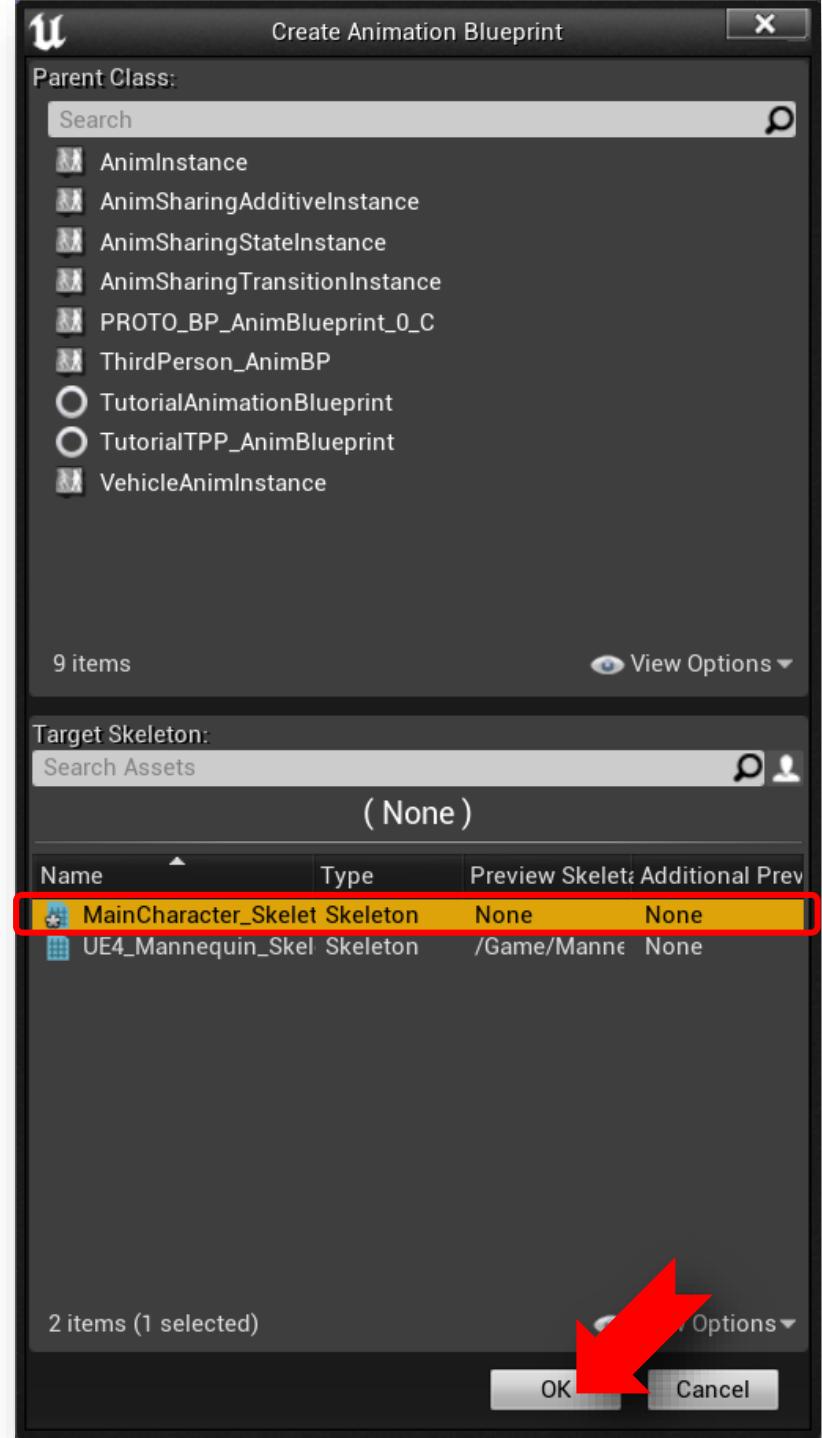
SideScrollerExampleMap (World) ArenaGeometry Ledges Ledge1 Ledge2 Ledge3 Ledge4 Ledge5 Ledge6

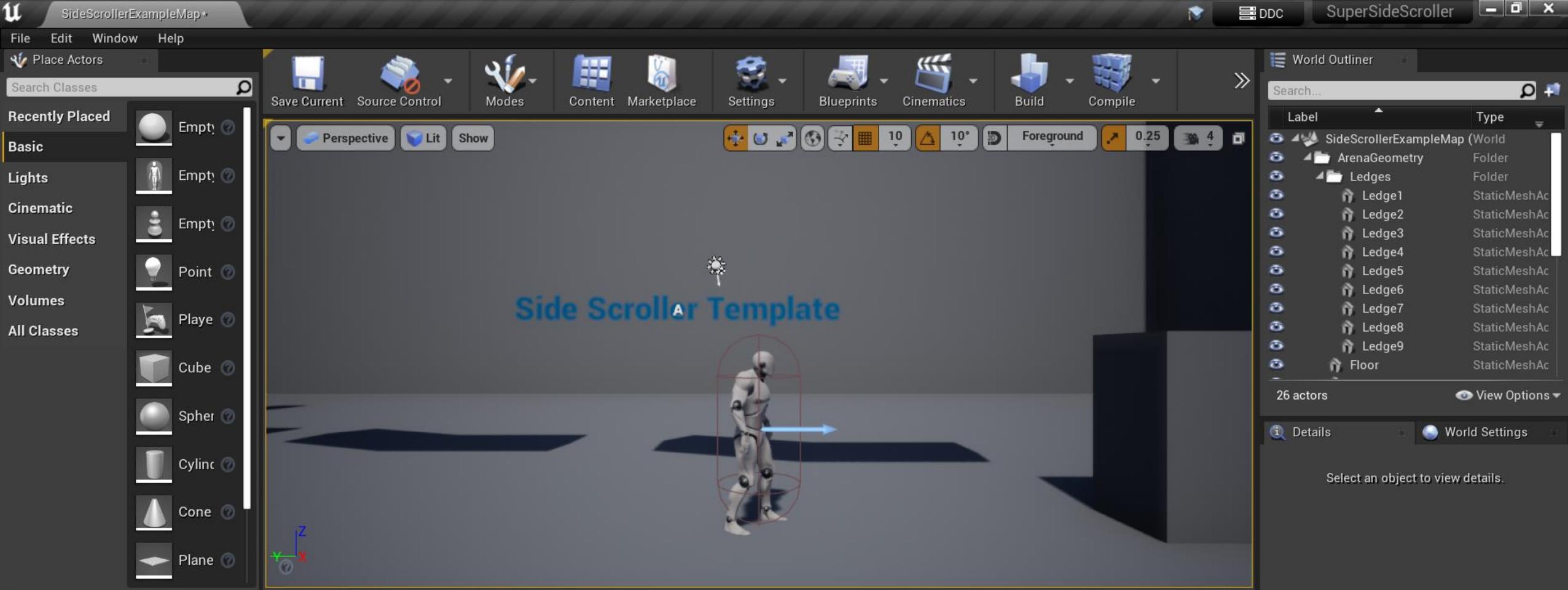
An Anim Blueprint is essentially a specialized Blueprint whose graphs control the animation of a Skeletal Mesh. It can perform blending of animations, directly control the bones of the skeleton, and output a final pose for a Skeletal Mesh each frame.

hold (Ctrl + Alt) for more

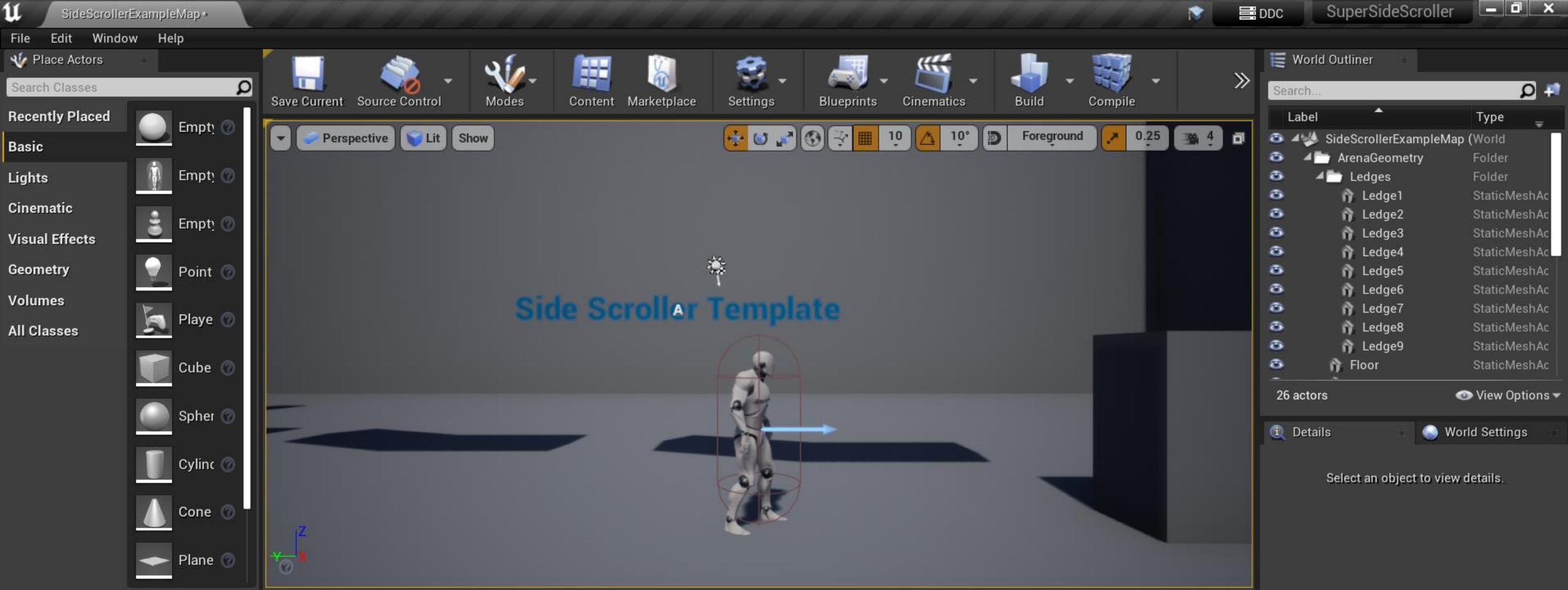
26 actors View Options Details World Settings Select an object to view details.

Right-Click

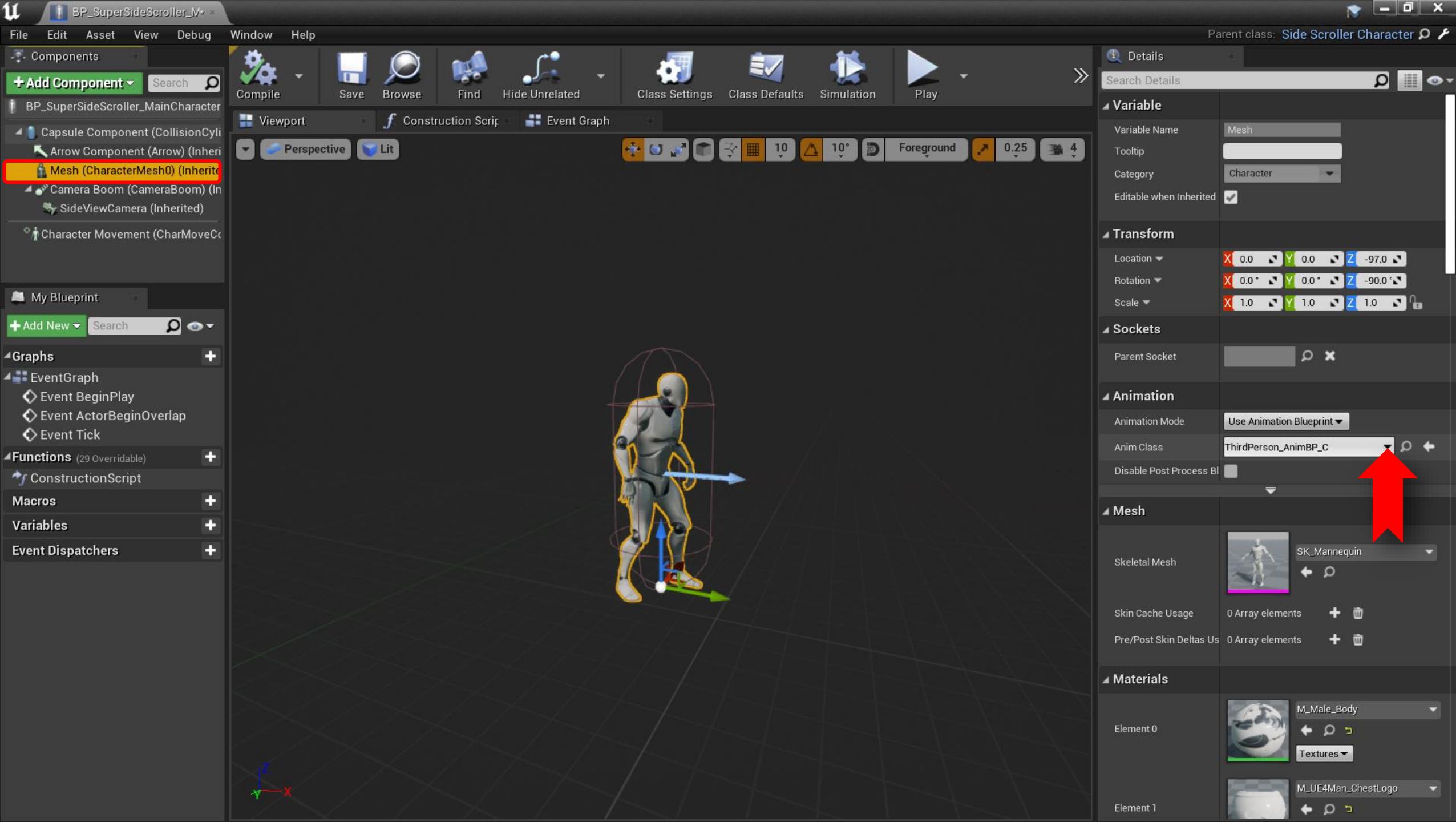


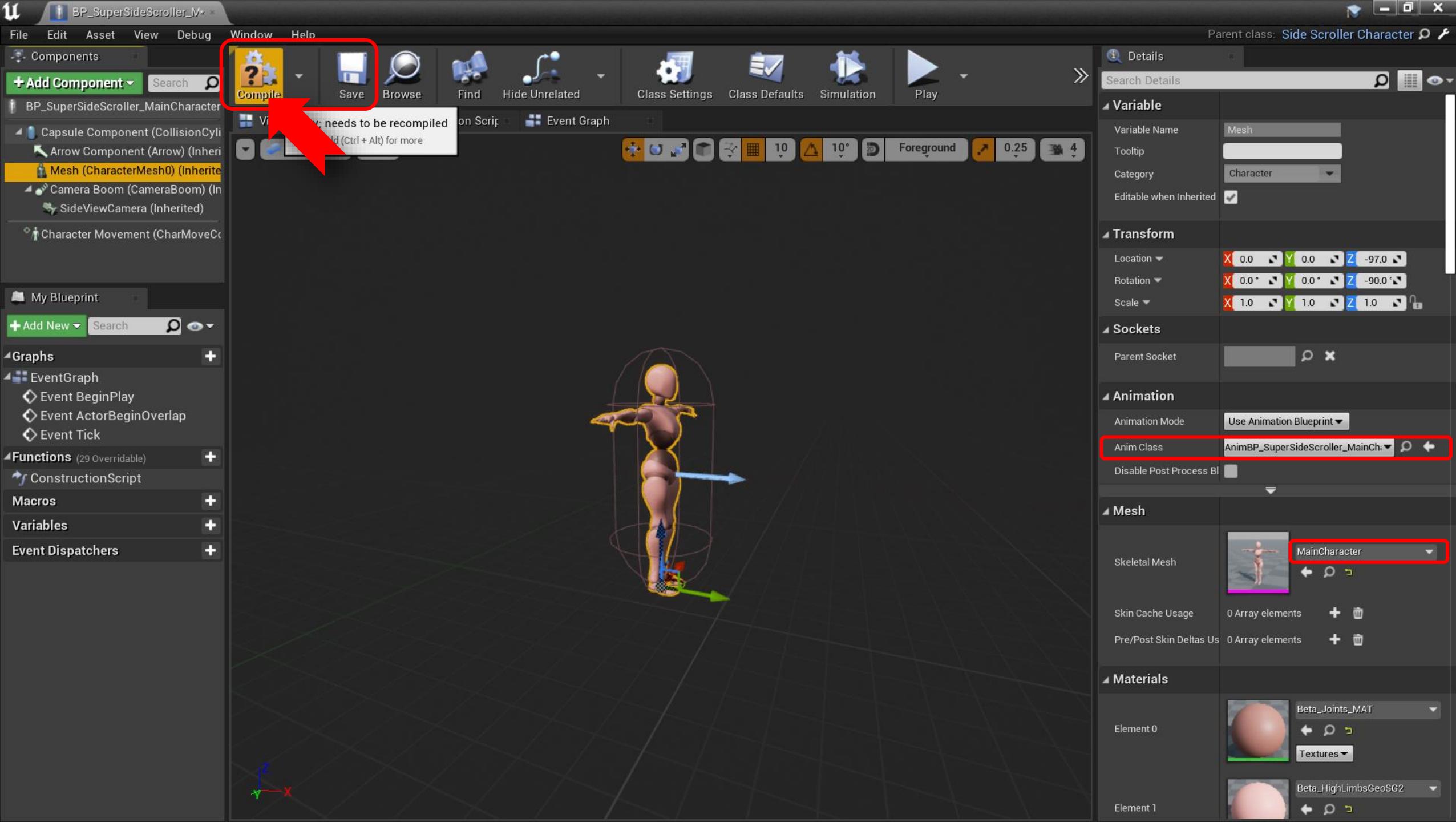


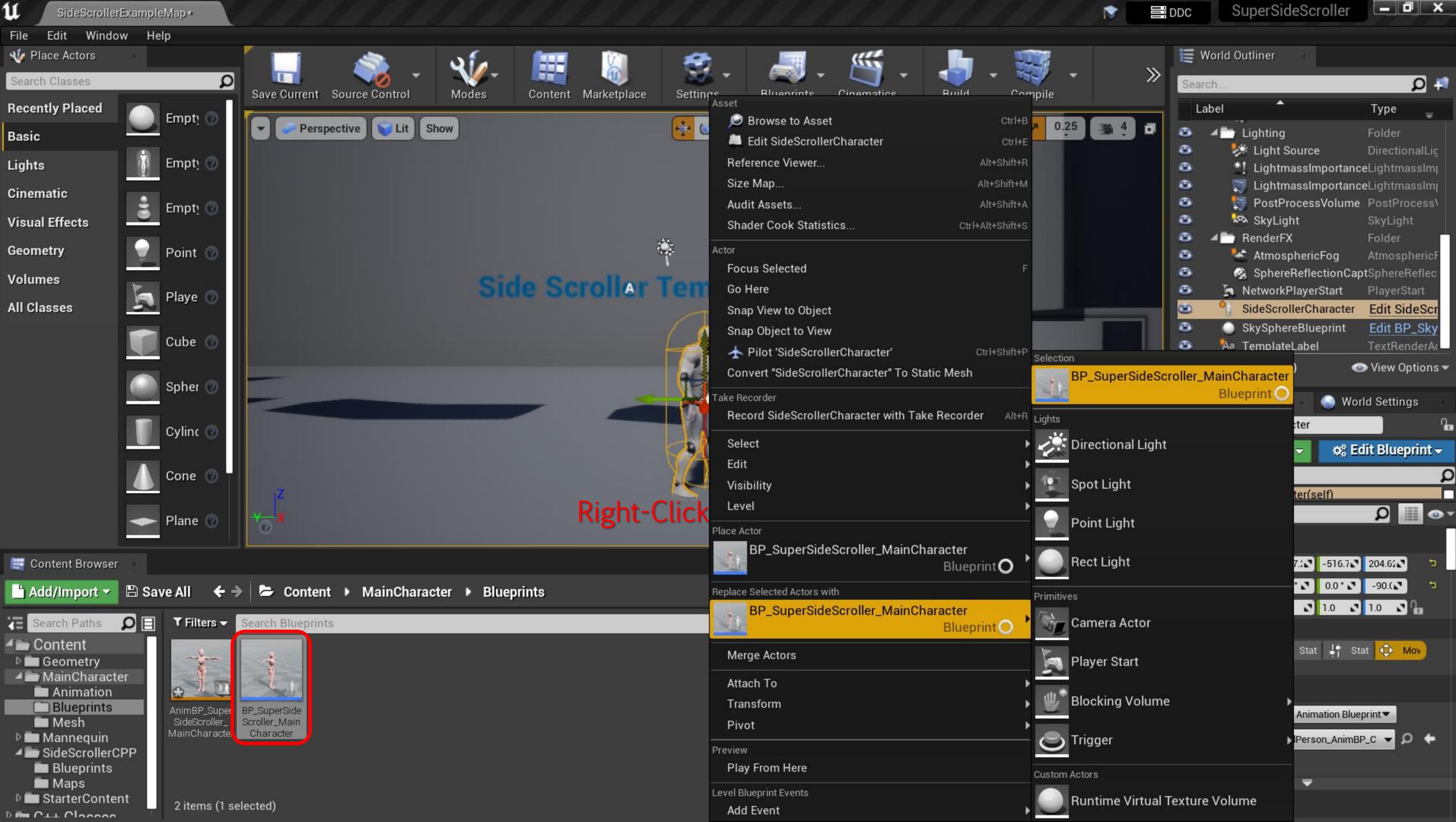
The Content Browser panel at the bottom of the screen displays the file structure and selected item. The left sidebar shows the Content tree with nodes like Content, Geometry, MainCharacter (selected), Animation, Blueprints, Mesh, Mannequin, SideScrollerCPP, Blueprints, Maps, StarterContent, and C++ Classes. The main area shows two items in the 'Blueprints' folder of 'MainCharacter': 'AnimBP_SuperSideScroller_MainCharacter' (highlighted with a red box) and 'BP_SuperSideScroller_MainCharacter'. A search bar at the top of the Content Browser says 'Search Blueprint'. The status bar at the bottom indicates '2 items (1 selected)' and 'View Options'.

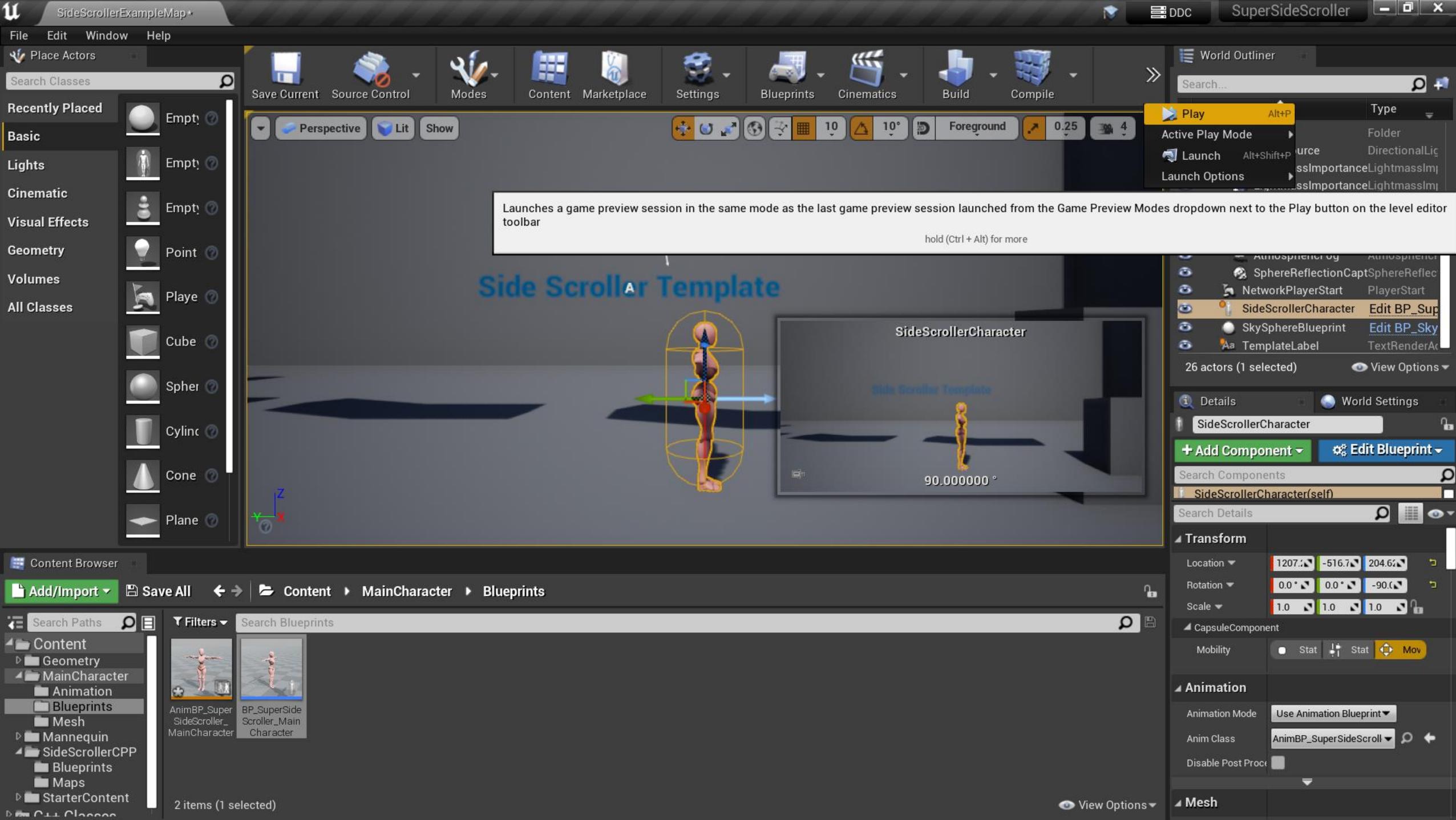


This screenshot shows the Content Browser panel of the Unreal Engine Editor. The title bar says 'Content Browser'. The main area displays the 'Blueprints' folder within the 'MainCharacter' content package. Two blueprints are listed: 'AnimBP_SuperSideScroller_MainCharacter' and 'BP_SuperSideScroller_MainCharacter'. The 'BP_SuperSideScroller_MainCharacter' blueprint is highlighted with a yellow selection box. A red arrow points from the previous screenshot towards this selection. The bottom of the Content Browser shows the message '2 items (1 selected)'.

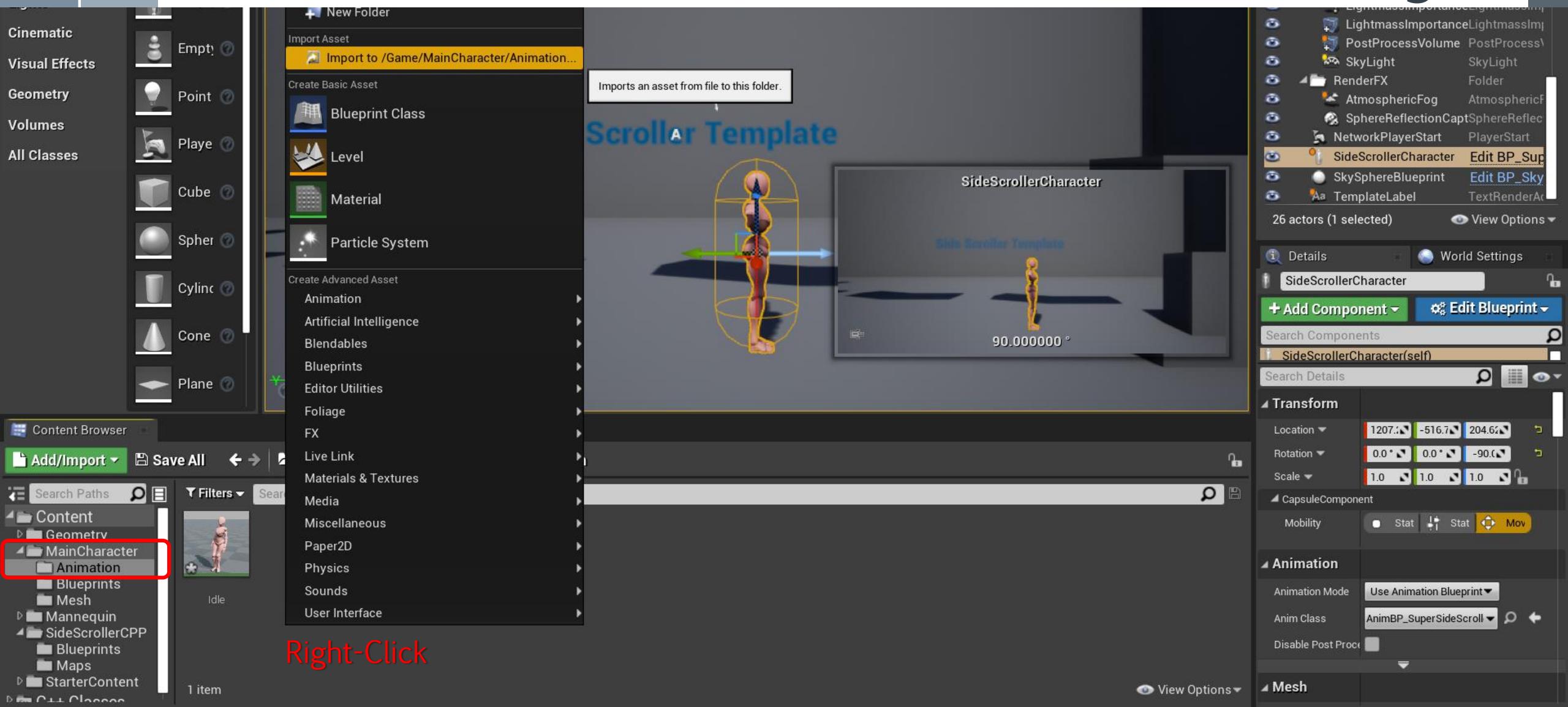


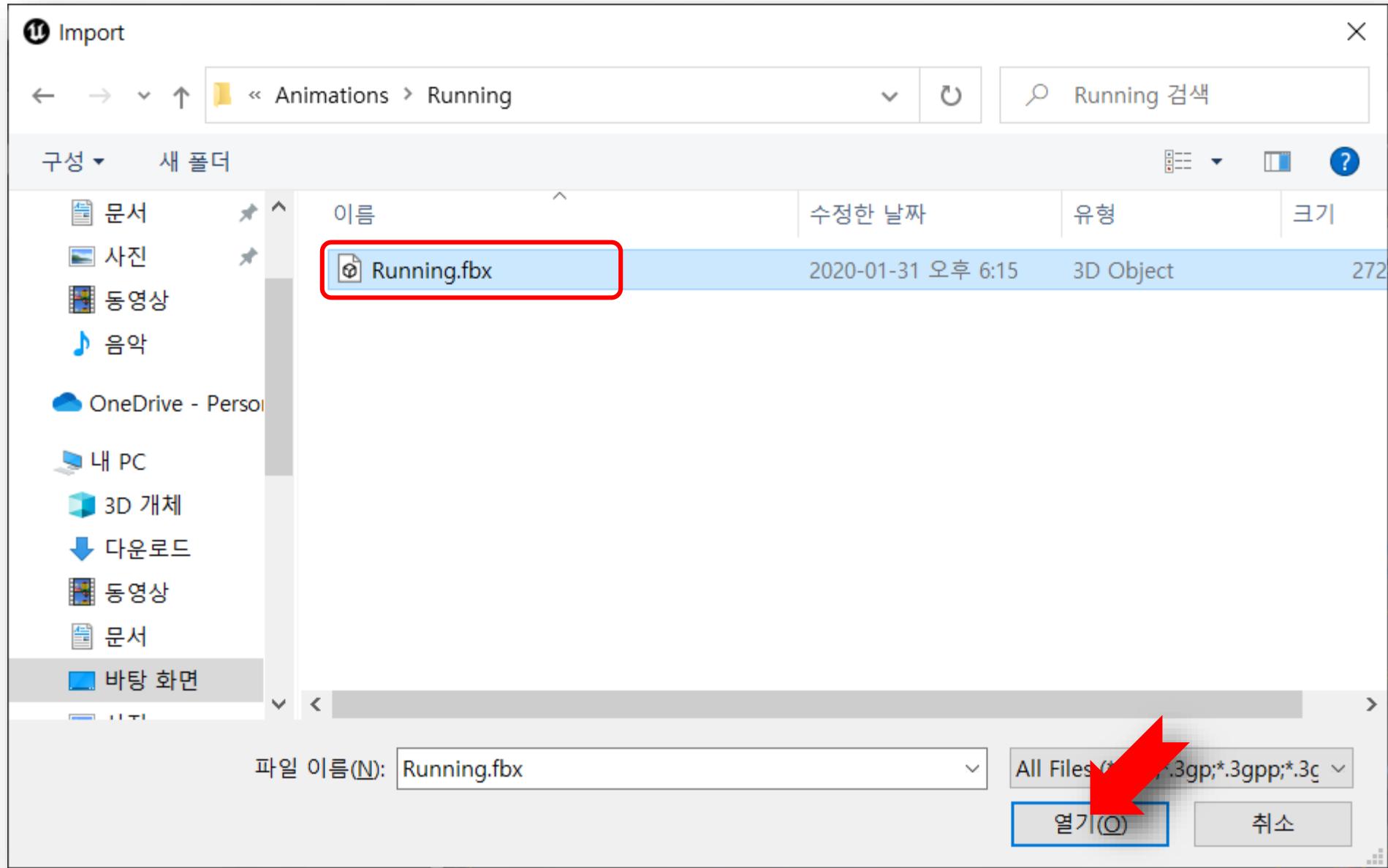


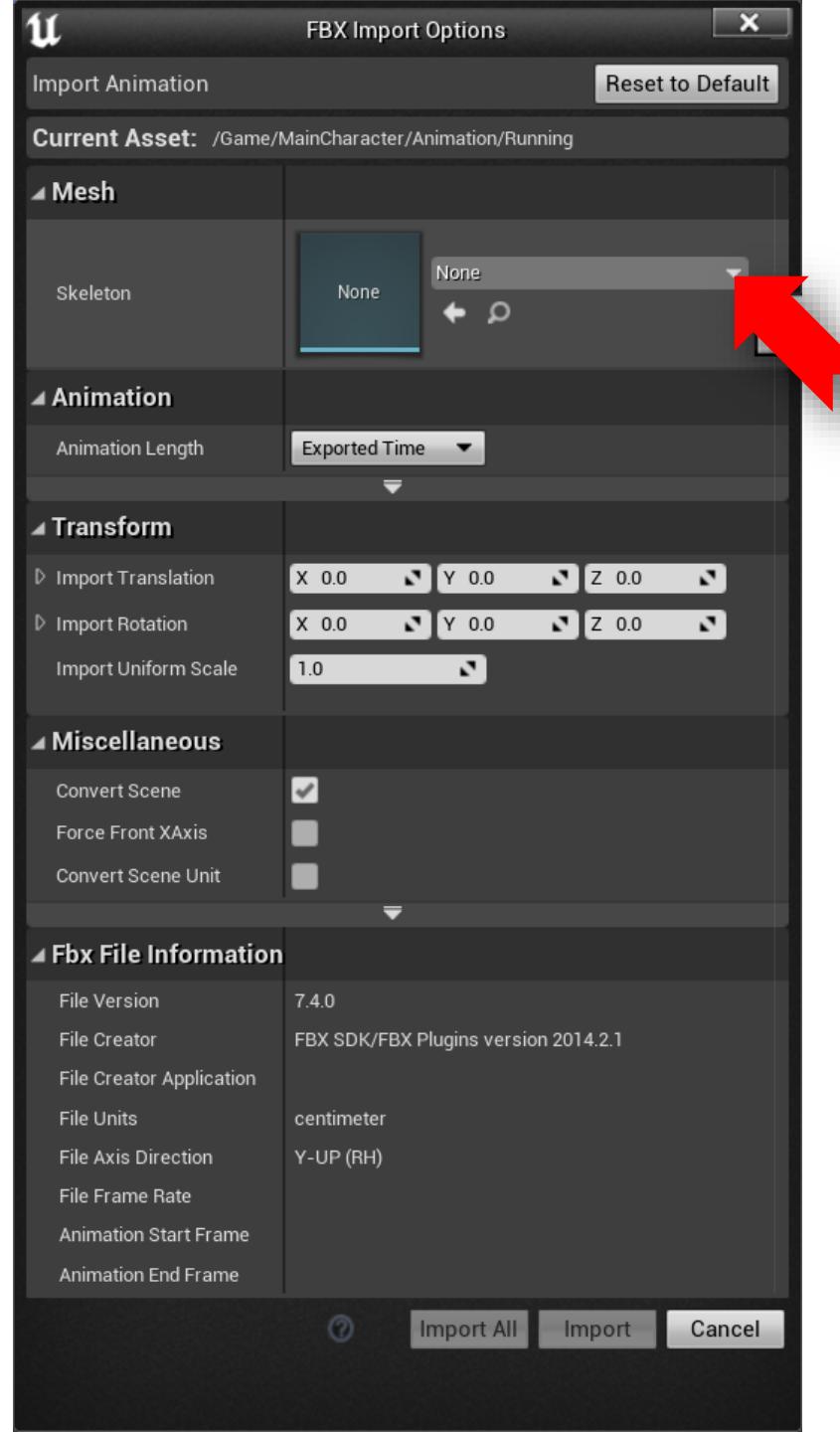


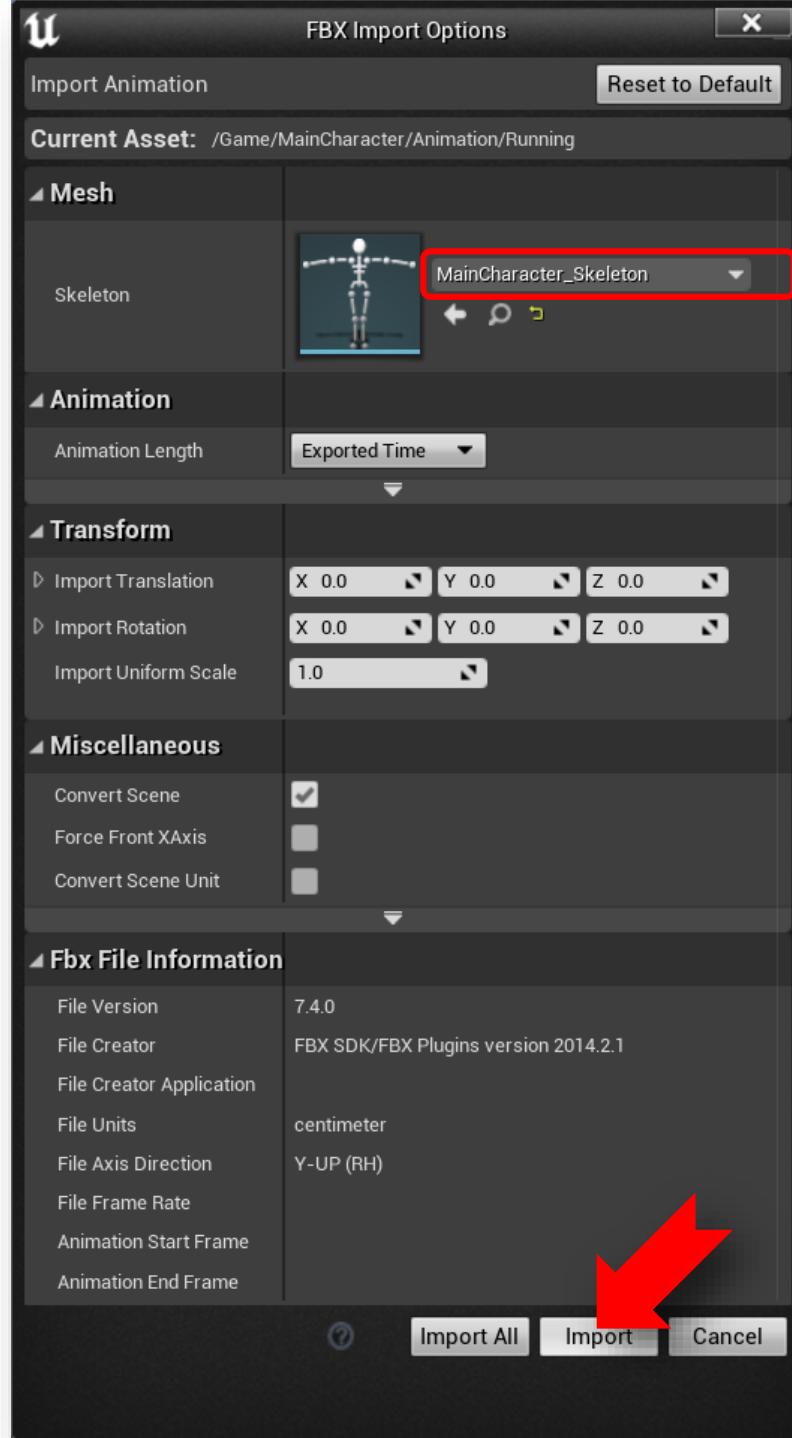


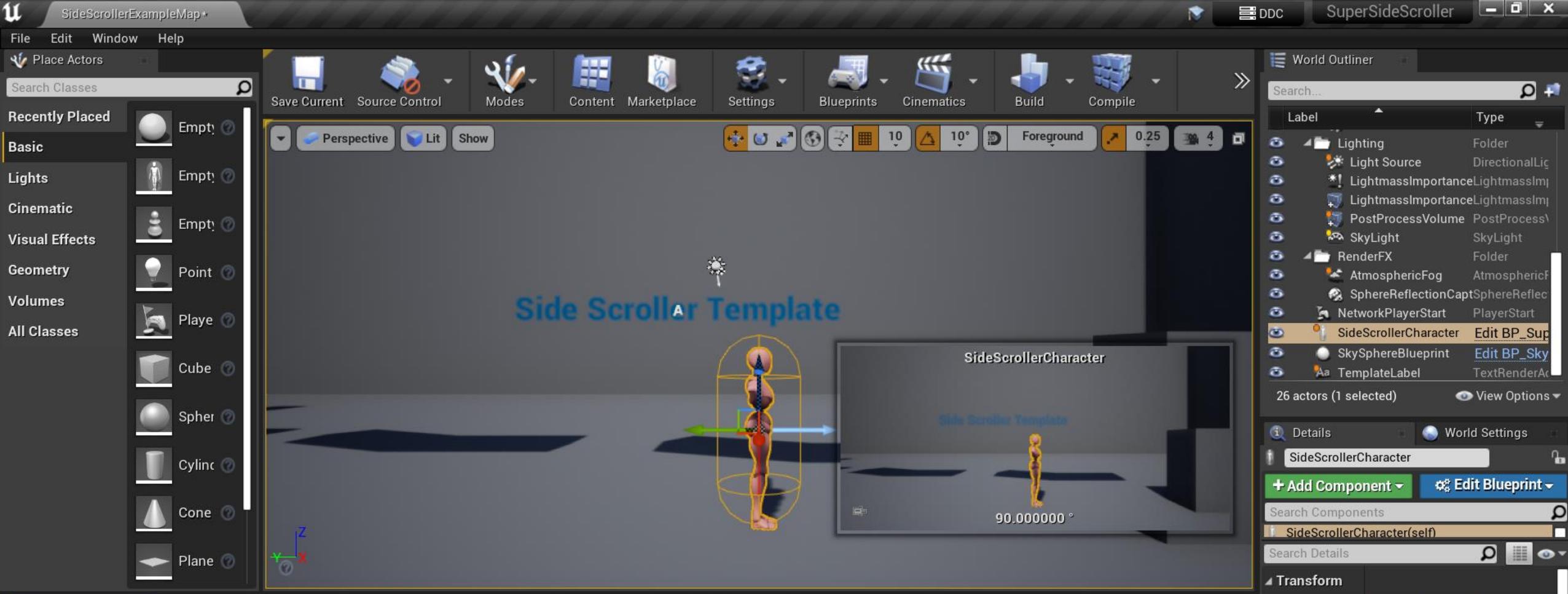
Activity 10.03: Importing More Custom Animations to Preview the Character Running



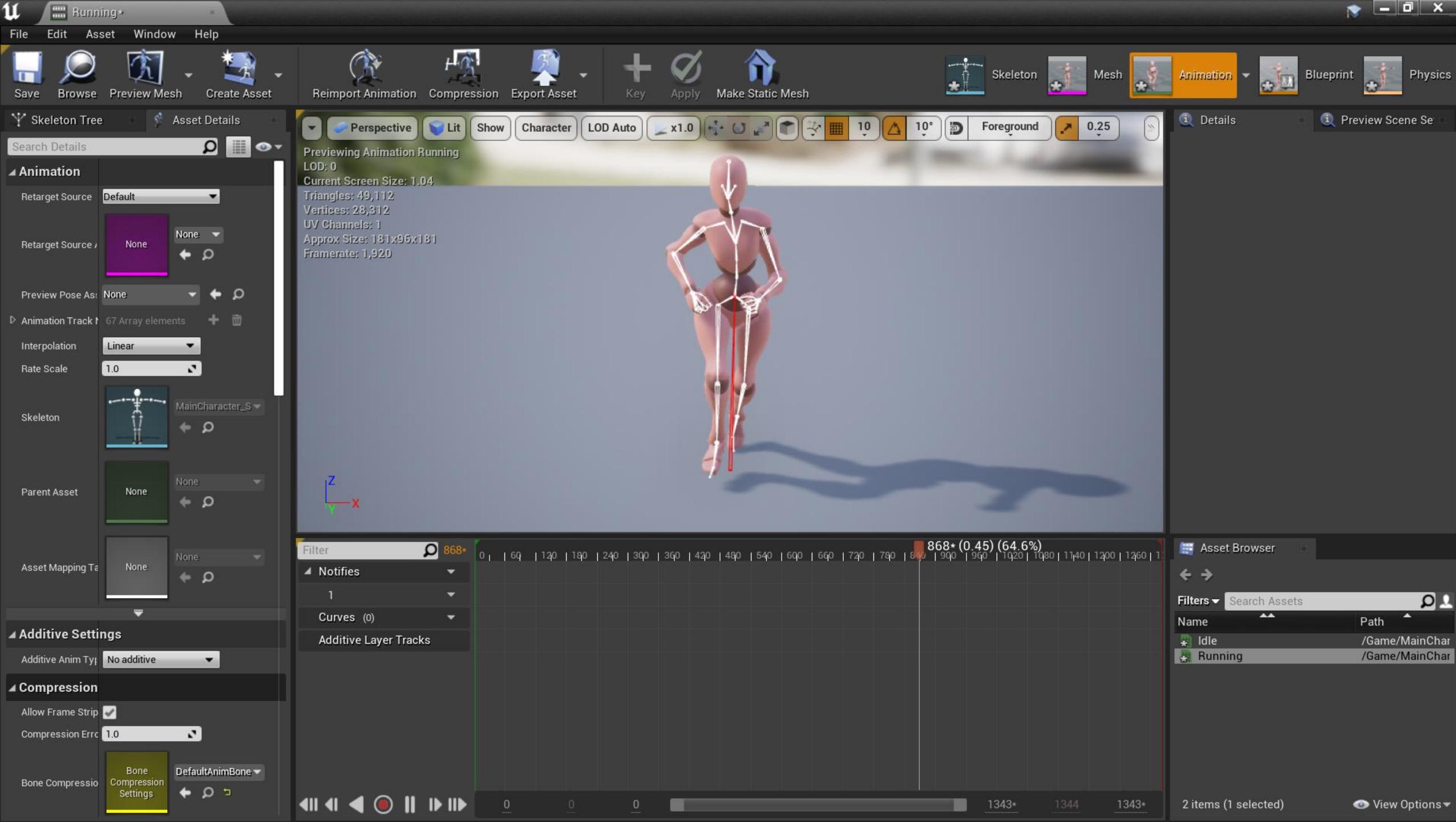








The Content Browser is open, showing the file structure under "Content/Content/MainCharacter/Animation". It contains two animation clips: "Idle" and "Running". A red arrow points to the "Running" clip, which is highlighted with a yellow selection box. The bottom status bar indicates "2 items (1 selected)".





연습 과제

› 다른 Animation(Jump, Throw, Walking)들도 모두 importing 하시오.

