

Apex Assault

A Project Report

Submitted in partial fulfilment of the
Requirements for the award of the Degree of

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

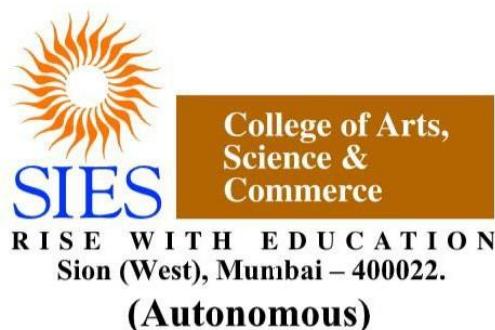
By

Supreet Sadashiv Bhuvanagiri

TIT2324007

Under the esteemed guidance of

Mrs. Biju Ramesh



DEPARTMENT OF INFORMATION TECHNOLOGY

SIES COLLEGE OF ARTS, SCIENCE & COMMERCE

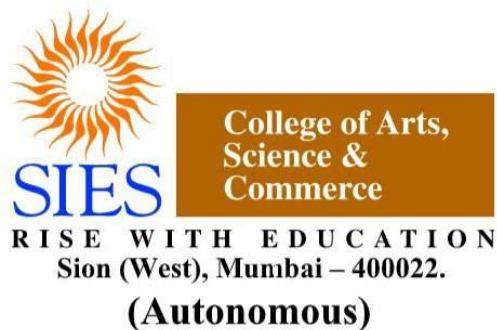
(AUTONOMOUS)

SION (W), MUMBAI, 400022 MAHARASHTRA

2023-2024

**SIES COLLEGE OF ARTS, SCIENCE &
COMMERCE (AUTONOMOUS)**
(Affiliated to University of Mumbai)
SION (W), MUMBAI-400022

DEPARTMENT OF INFORMATION TECHNOLOGY



CERTIFICATE

This is to certify that the project entitled, "**Apex Assault**", is bonafide work of **Mr. Supreet Sadashiv Bhuvanagiri** bearing Seat No: **TIT2324007** submitted in partial fulfilment of the requirements for the award of degree of **BACHELOR OF SCIENCE** in **INFORMATION TECHNOLOGY**.

Ms. Biju Ramesh

Internal Guide

Ms. Sudha.B

Coordinator

Date:

External Examiner

Table of Contents

Gantt Chart	30
Chapter 5: Implementation and testing	31
5.1 Implementation Approaches	31
5.2 Blueprints	31
5.3 Test Approach	79
5.4 Test Cases	80
5.4.1 Home Screen	80
5.4.2 In-game Settings	80
5.4.3 Endgame Screen	82
Chapter 6: Results and Discussions	83
6.1 Test Report	83
6.2 User Documentation	83
Chapter 7: Conclusion	89
7.1 Significance of the System	89
7.2 Limitations of the System	89
7.3 Future Scope of the Project	89

List of Tables

5.4.1 Home Screen Table	80
5.4.2 In-Game Settings Table	80
5.4.3 Endgame Screen Table	82

List of Figures

6.2 User Documentation	83
Figure 1 : Basic UI of the game	83
Figure 2 : Pause menu	84
Figure 3 : General Mechanics of the Game	84
Figure 4 : Zombies attacking the player	85
Figure 5 : Player can use various weapons	85
Figure 6 : Player firing at enemies	86
Figure 7 : Player Reloading	86
Figure 8 : The minimap	87
Figure 9 : Reach the safezone	87
Figure 10 : Game over message	88

Gantt Chart

ID	Name	2023							2024				
		Jun 2023	Jul 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023	Jan 2024	Feb 2024	Mar 2024	A.	
1	Chapter 1			■									
2	Chapter 2				■								
3	Chapter 3					■							
4	Chapter 4		⋮			■							
5	Designing								■				
6	Testing									■			
7	Chapter 5										■		
8	Chapter 6										■		
9	Chapter 7											■	

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Chapter 5: Implementation and Testing

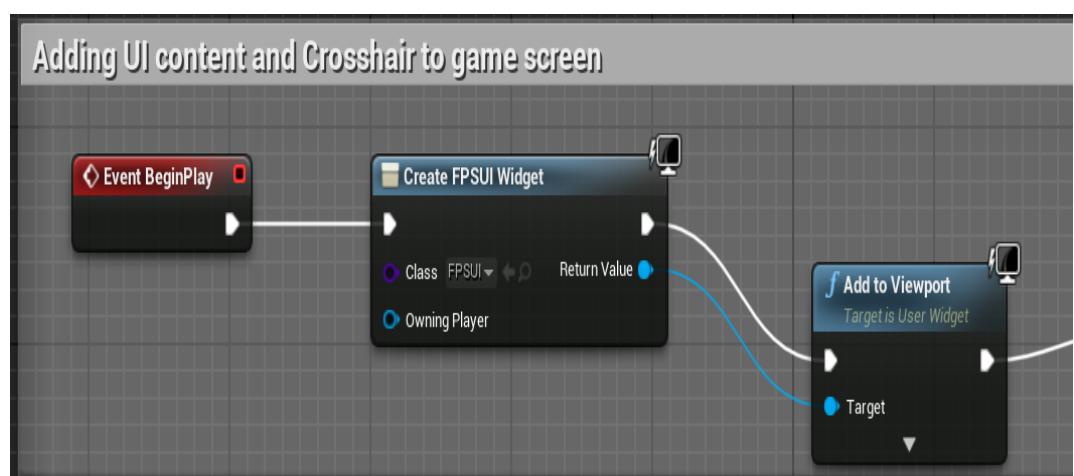
5.1. Implementation Approaches

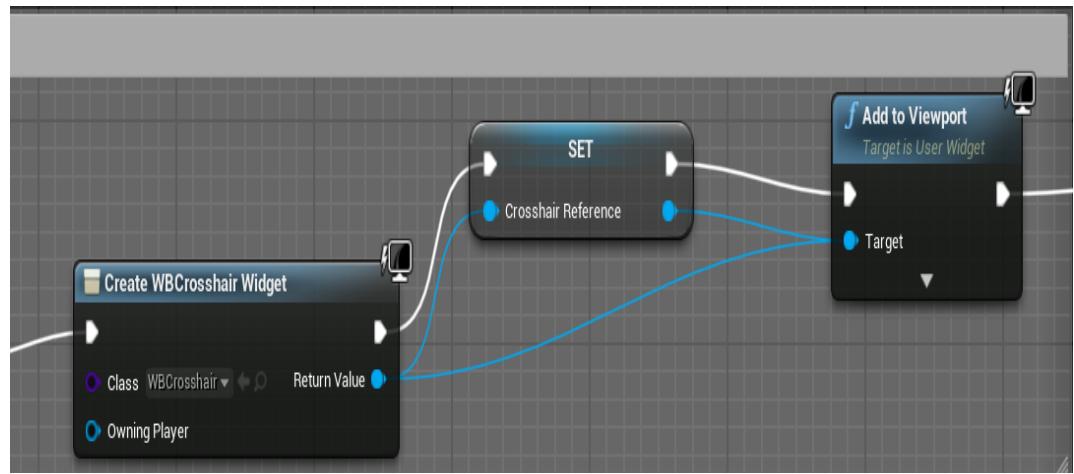
UI for Apex Assault has been kept simple and easy to use keeping in mind that the player can belong to any age group. The Homescreen has just two buttons to select on. The “New Game” button and the “Settings” button. The "New Game" button is prominent and effectively invites users to start playing. Ensure that it provides immediate feedback upon being pressed, such as a subtle animation or color change, to confirm the user's action. The settings menu is comprehensive, covering essential aspects like volume, graphics, and resolution. To enhance clarity, you might want to categorize these settings into tabs or sections. For example, create separate tabs for "Audio," "Graphics" and "Resolution" to streamline the user experience. The Graphics and Resolution are pivotal for the visual experience of the user. Consider providing brief descriptions or tooltips for each option to help users set the visual beauty of the game as per their choice or the hardware support. This can enhance user confidence and satisfaction with the game settings. Also, once the player is done completing the level a “MISSION COMPLETED” message will appear on the screen and an option for restart or exit will be given.

5.2 Blueprints

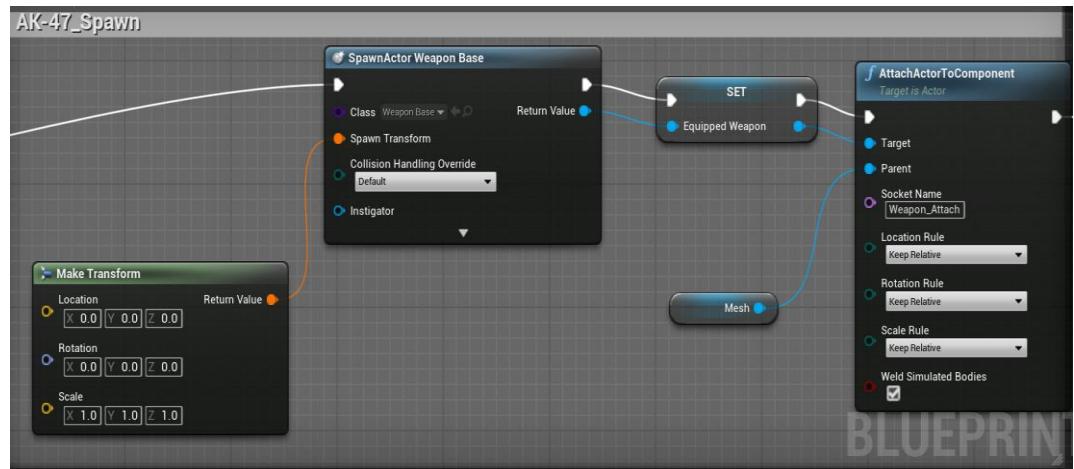
ThirdPersonCharacterBlueprints

Adding UI content to viewport

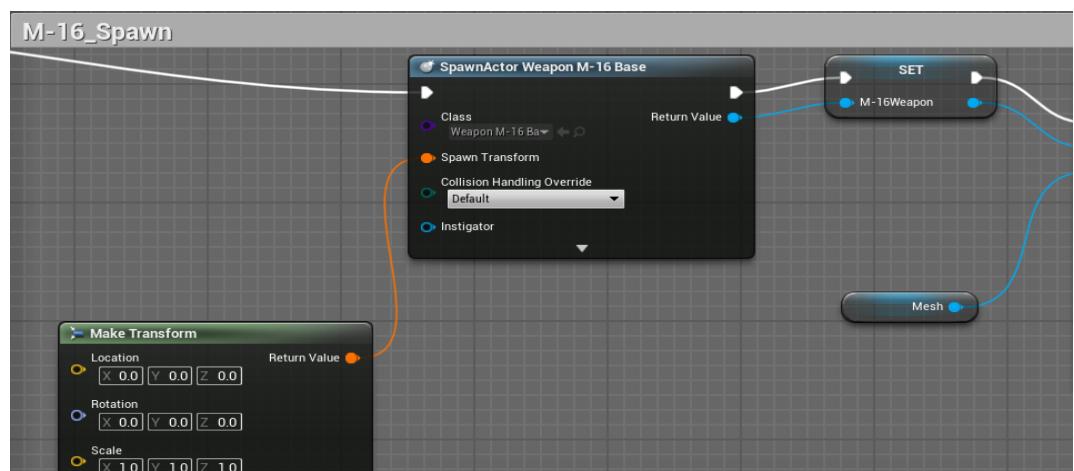


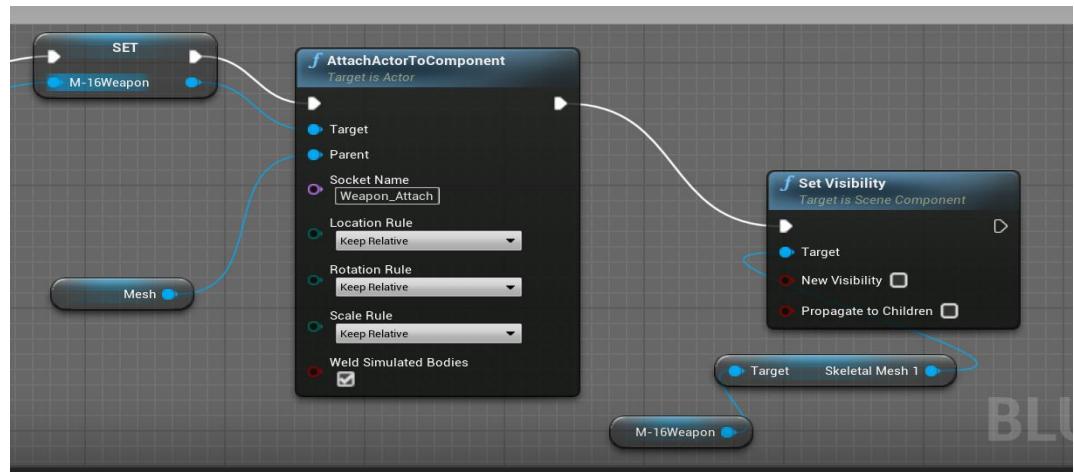


Adding ak-46 to viewport/gamescreen

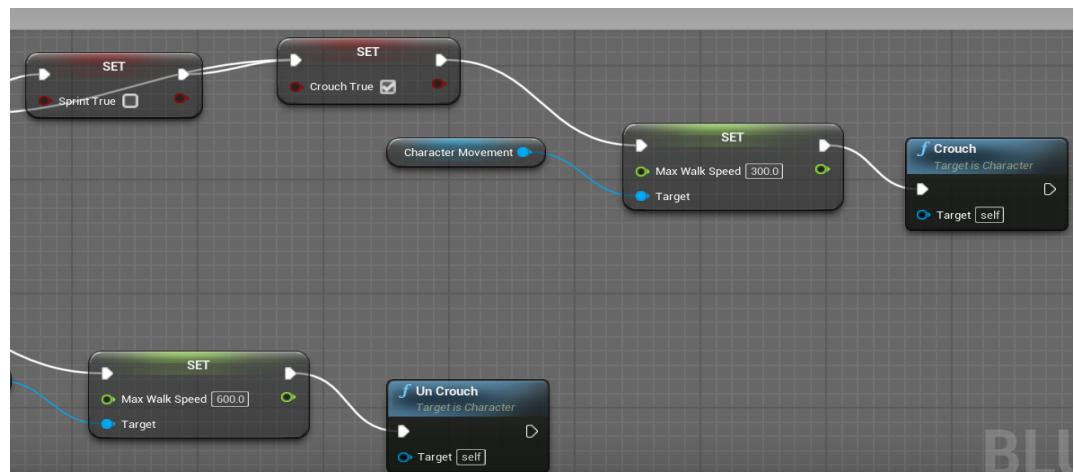
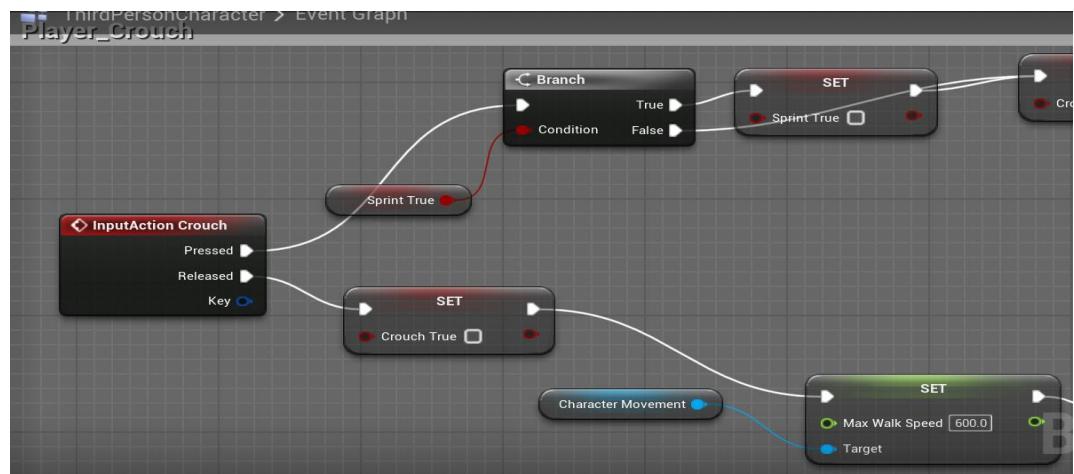


Adding m-16 to viewport-

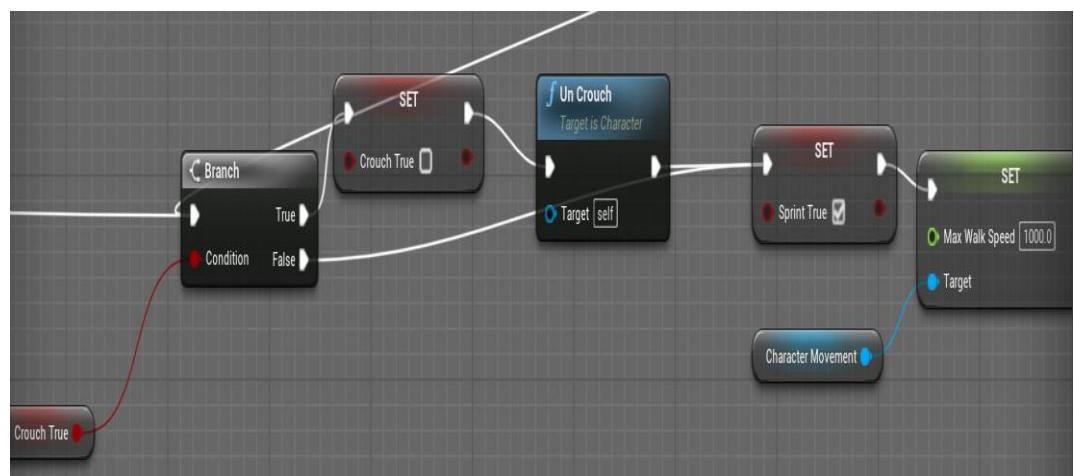
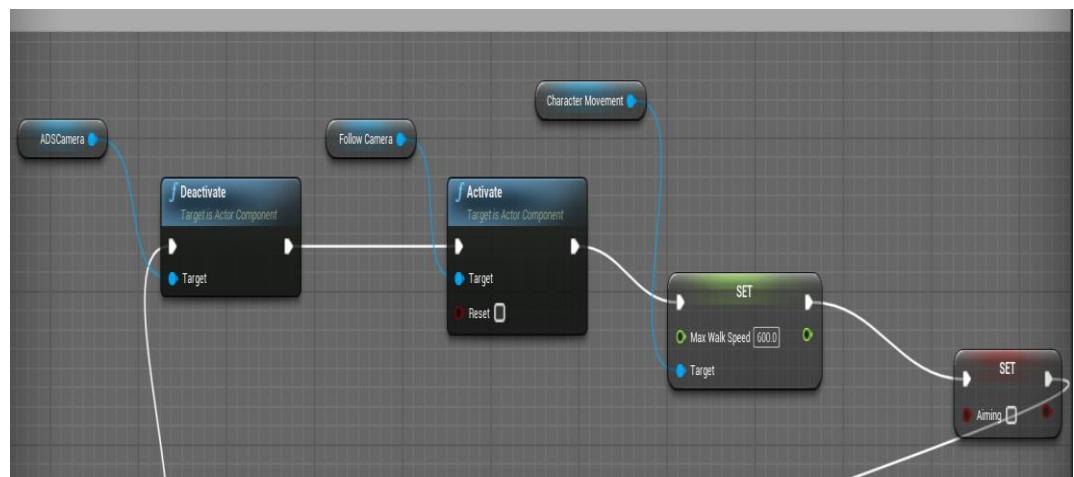
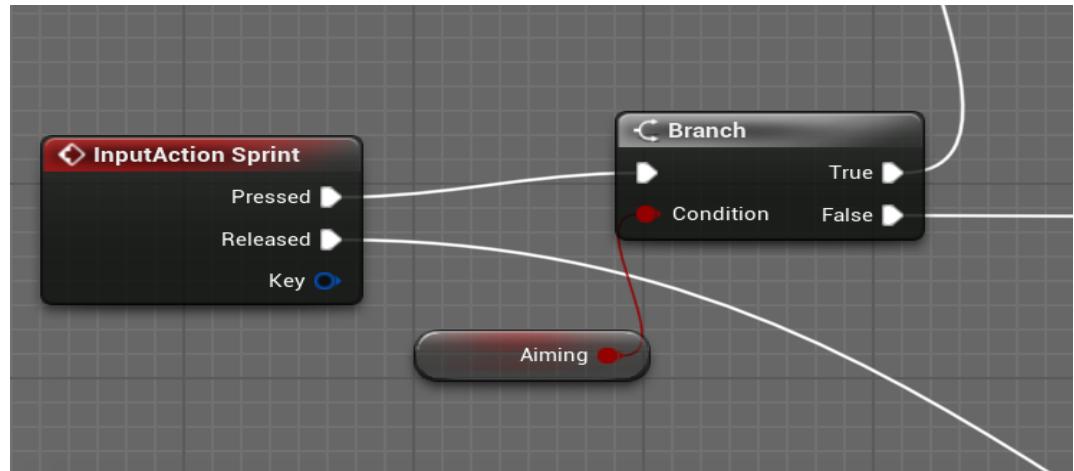


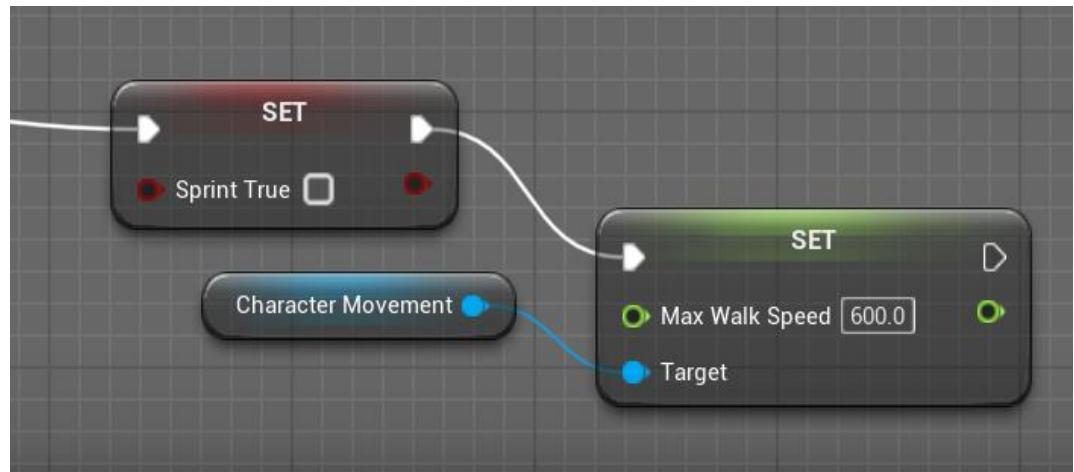


Player crouch

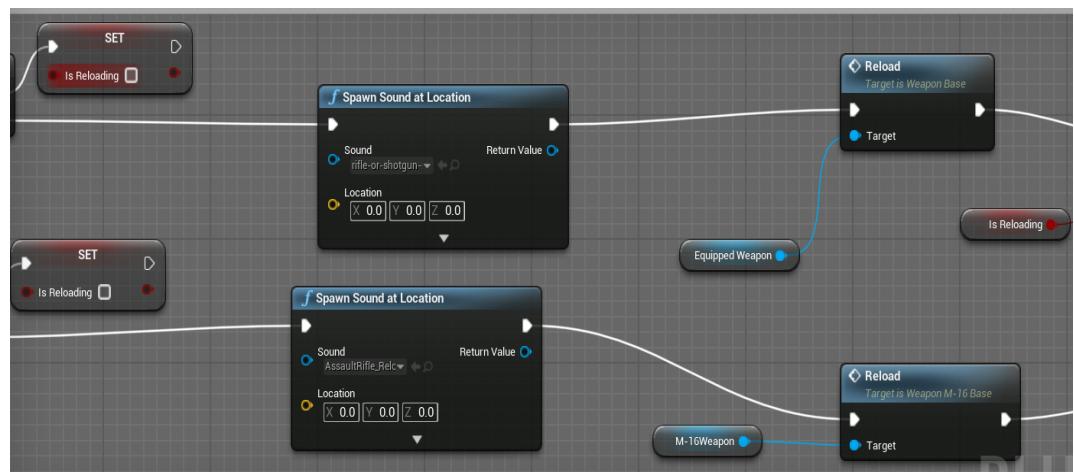
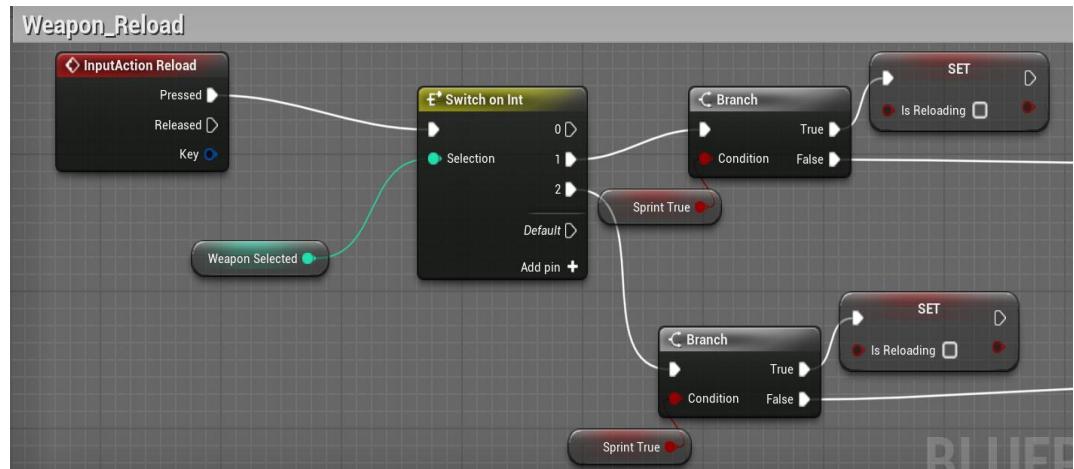


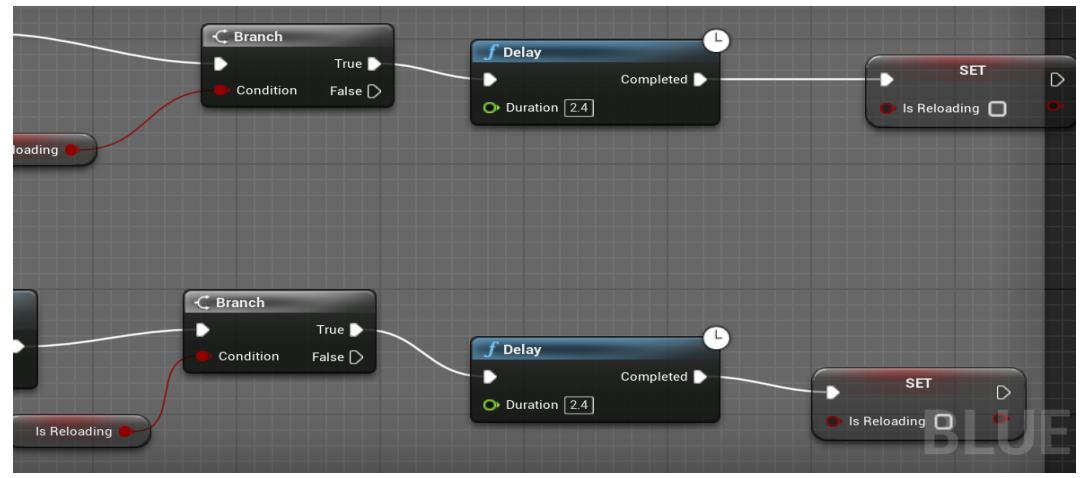
Player sprint



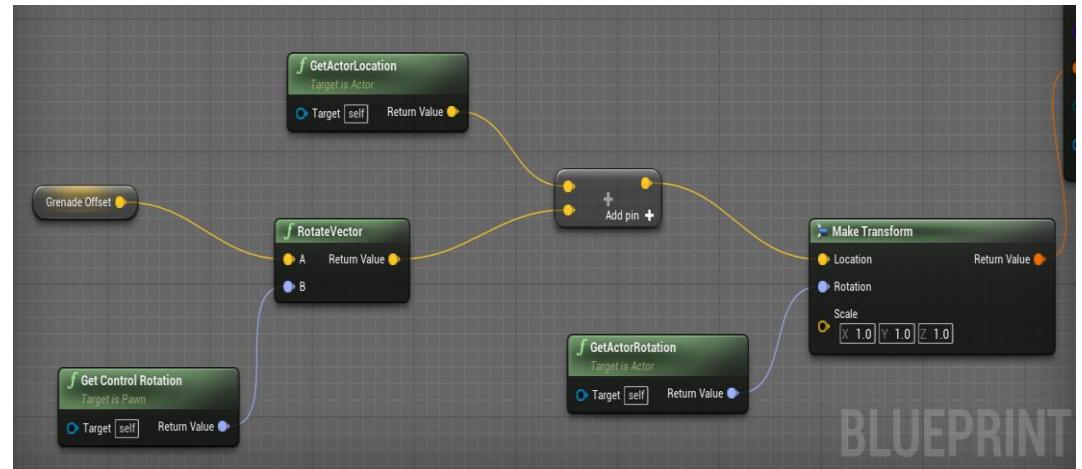
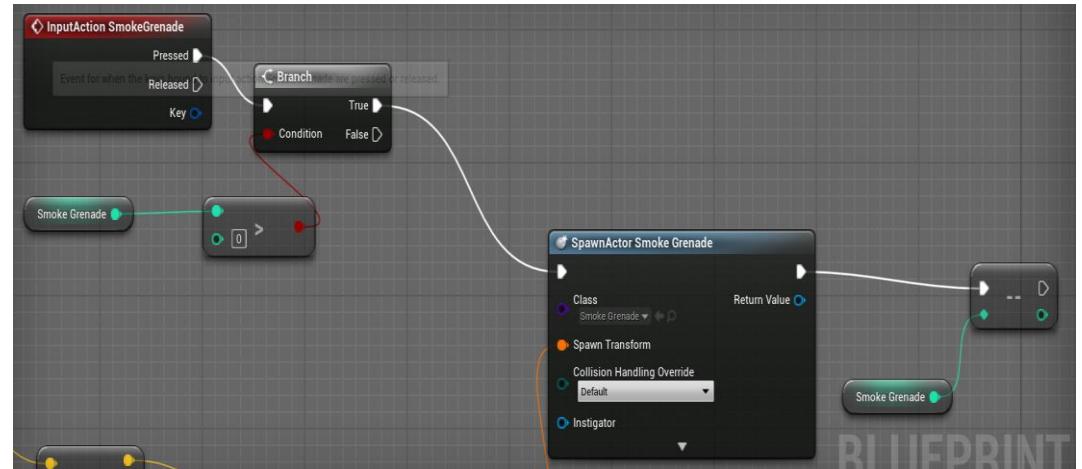


Weapon Reload

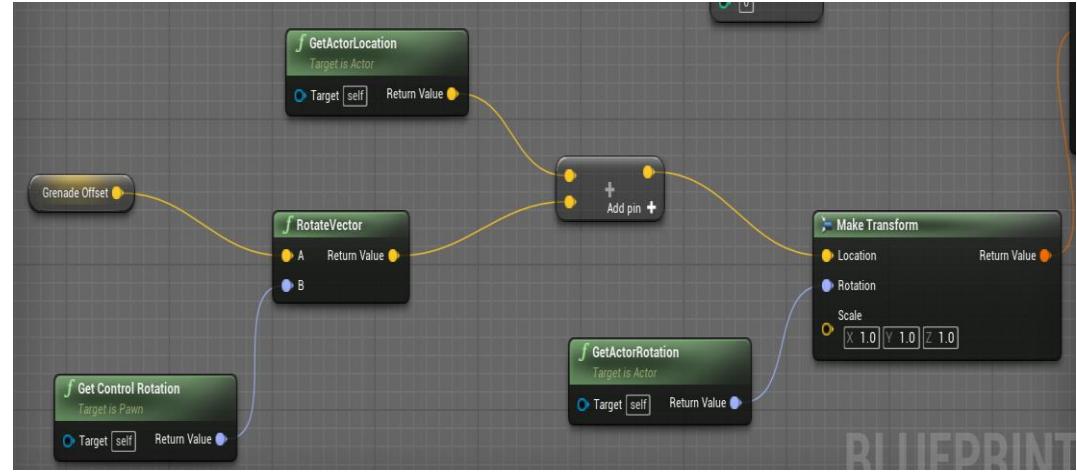
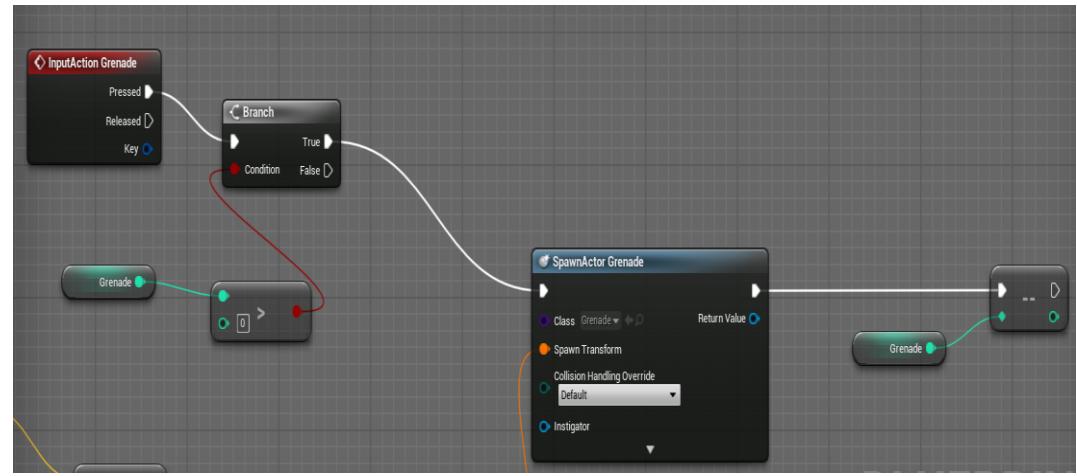




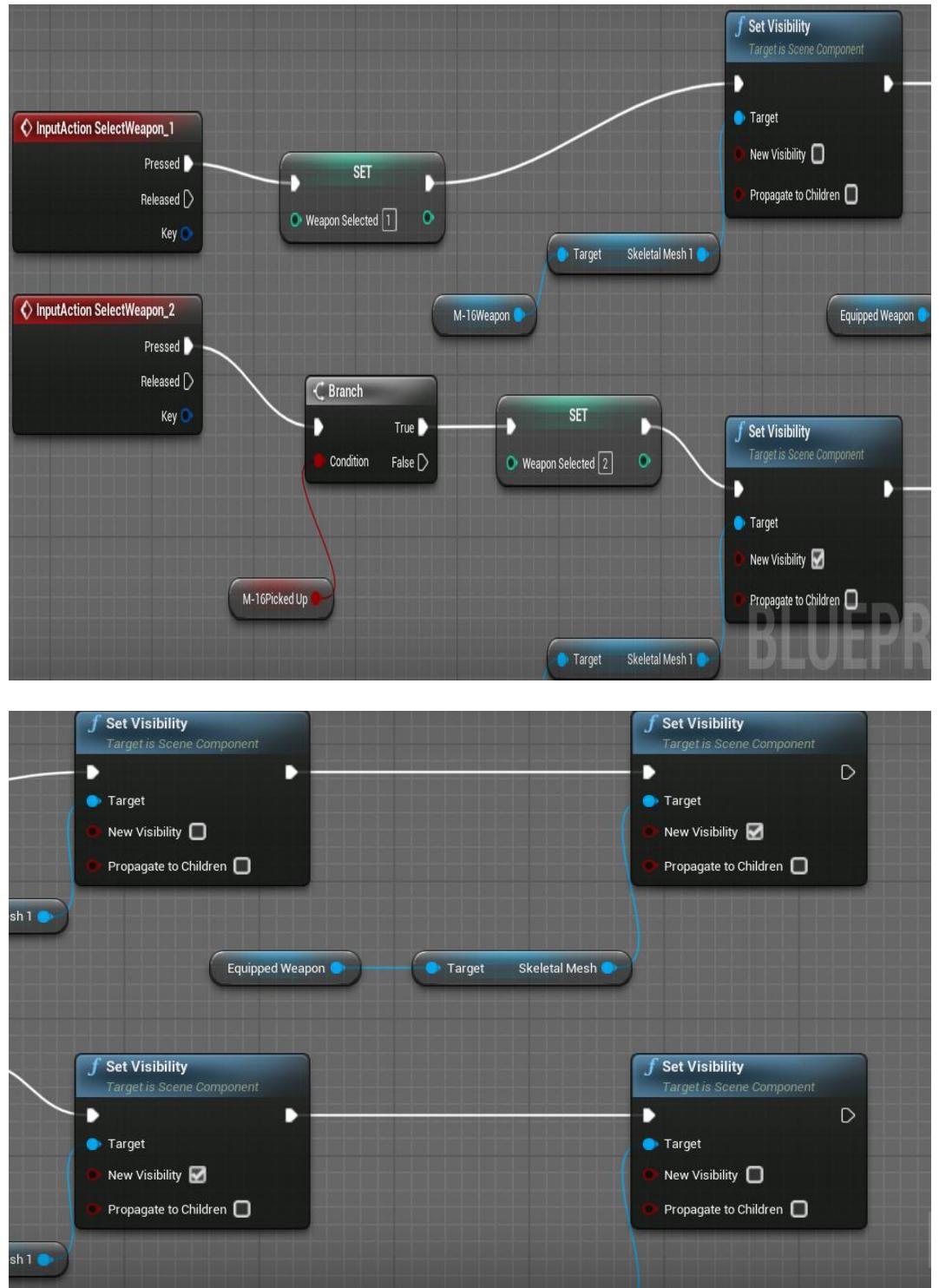
Smoke Grenade



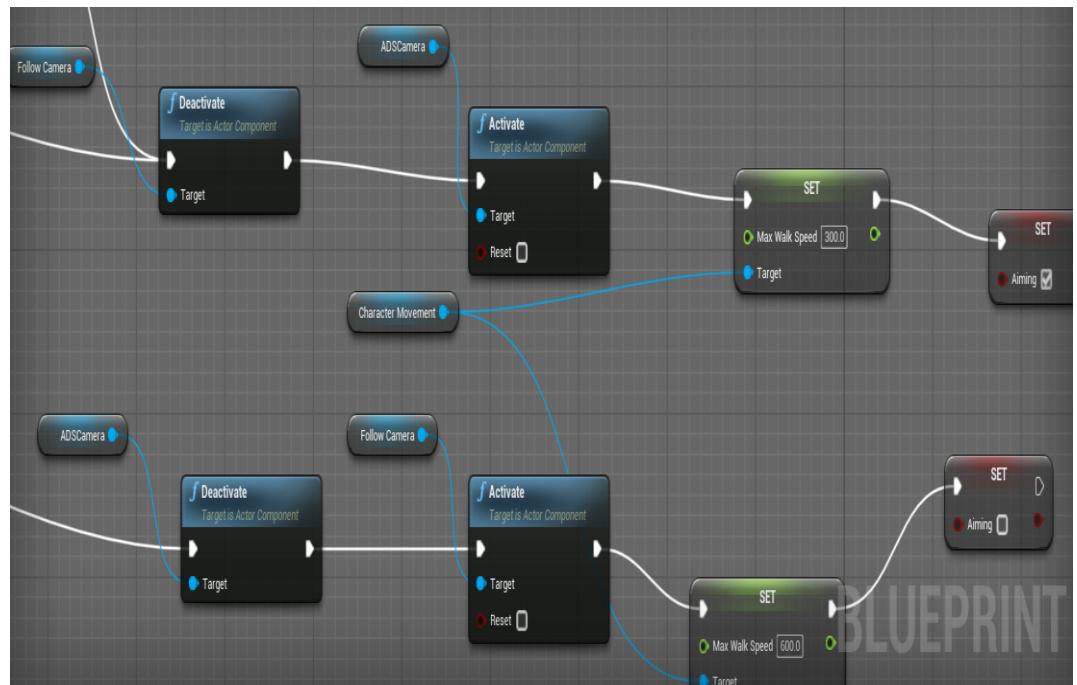
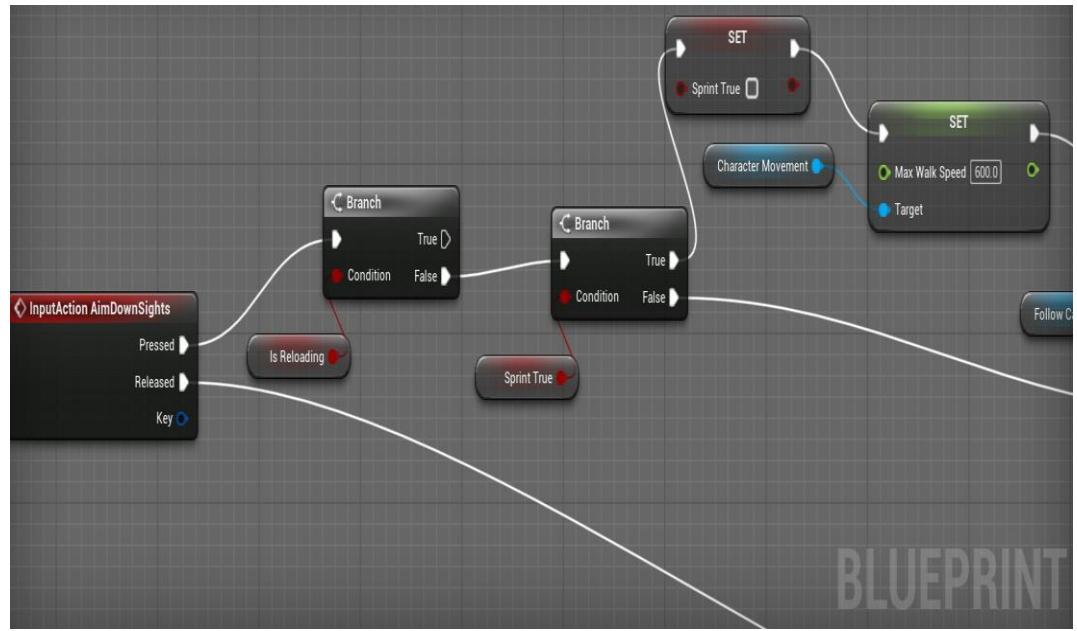
Grenade



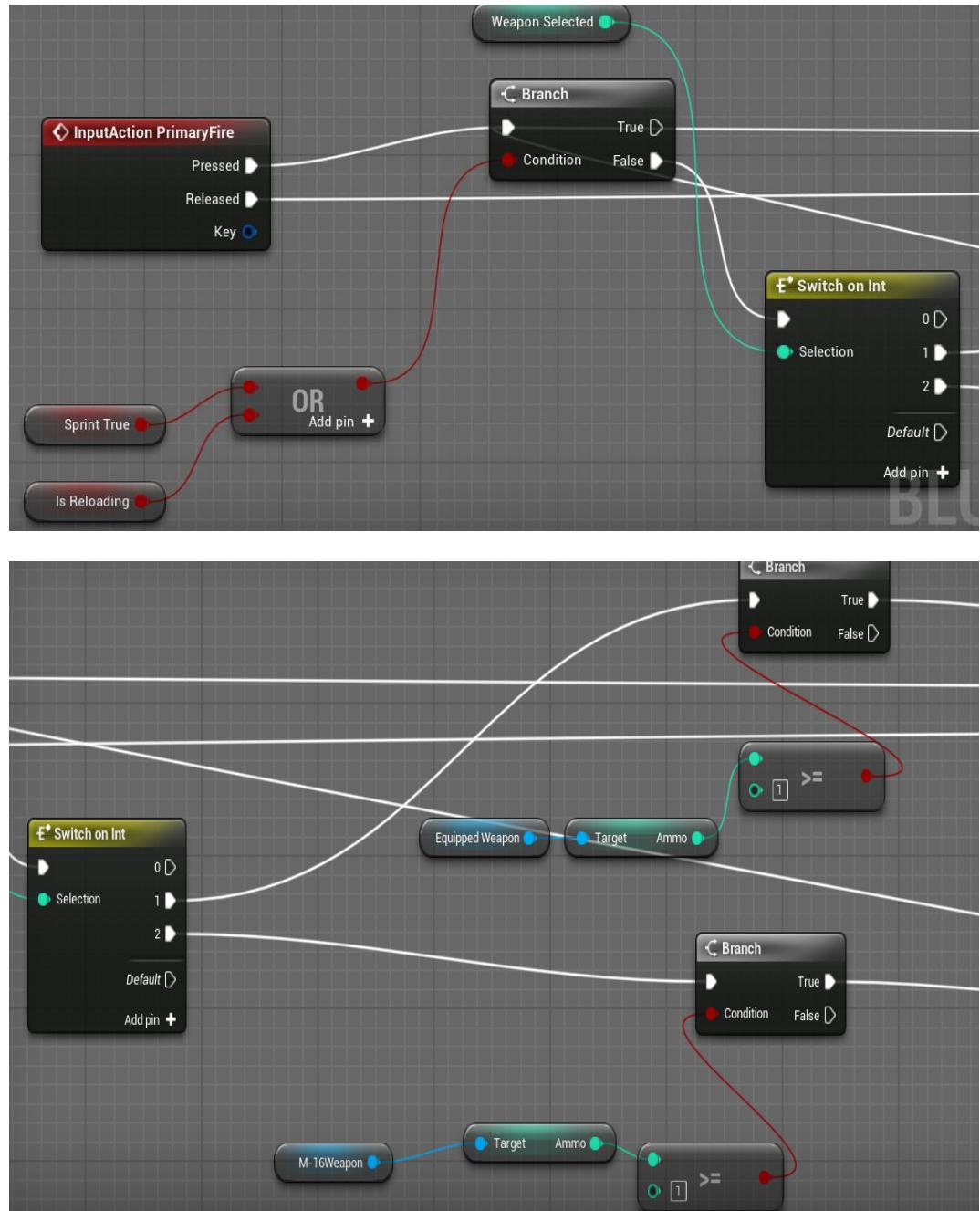
Weapon Visibility

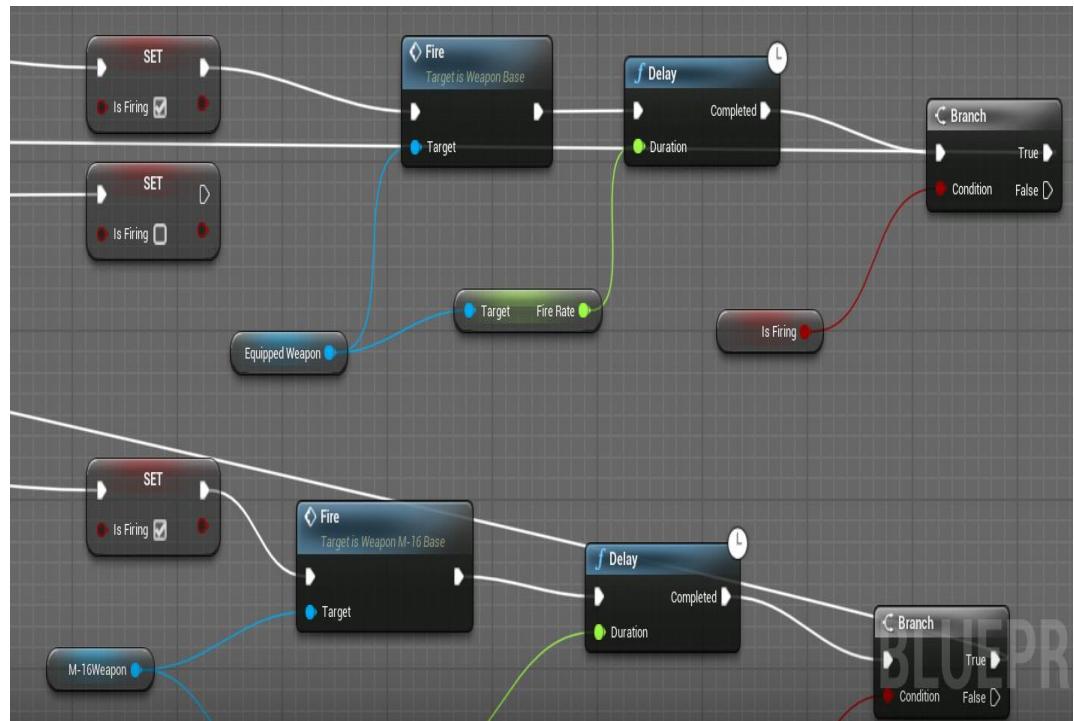


Camera Aiming

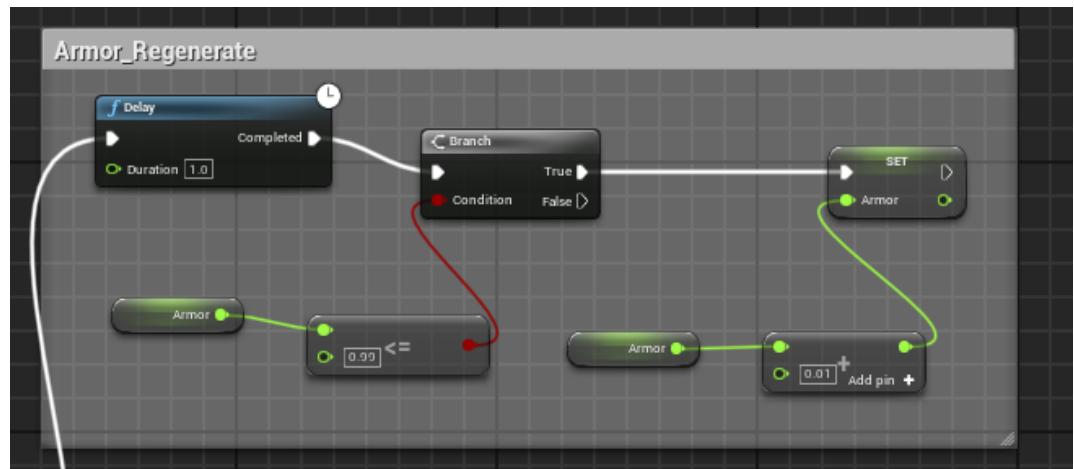


Gunfire

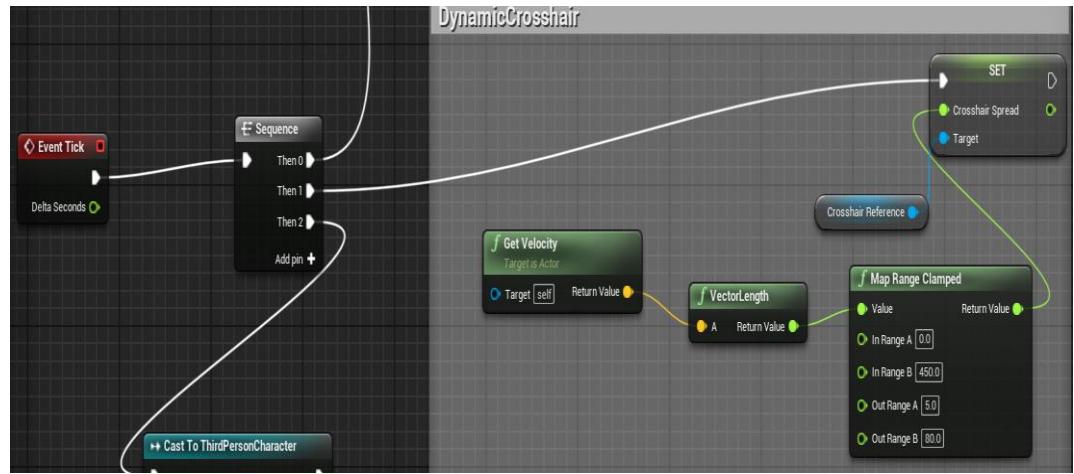




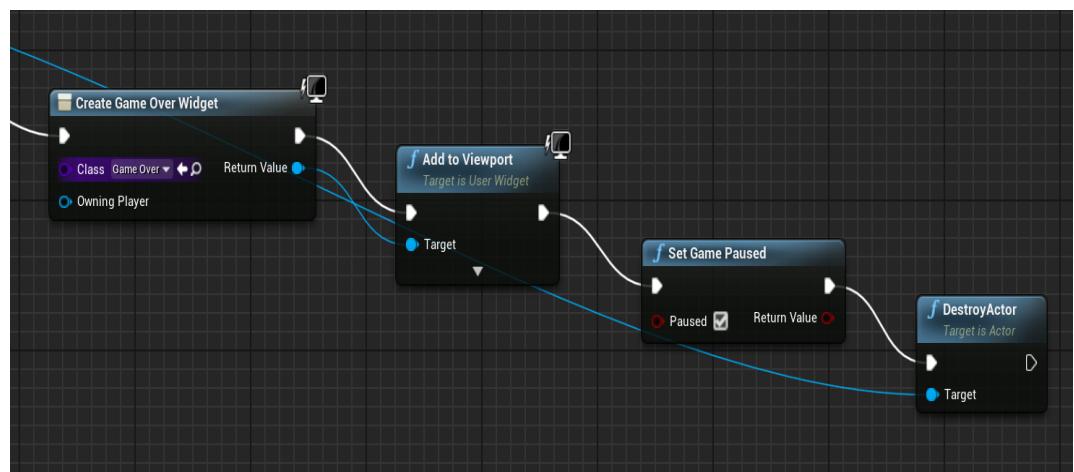
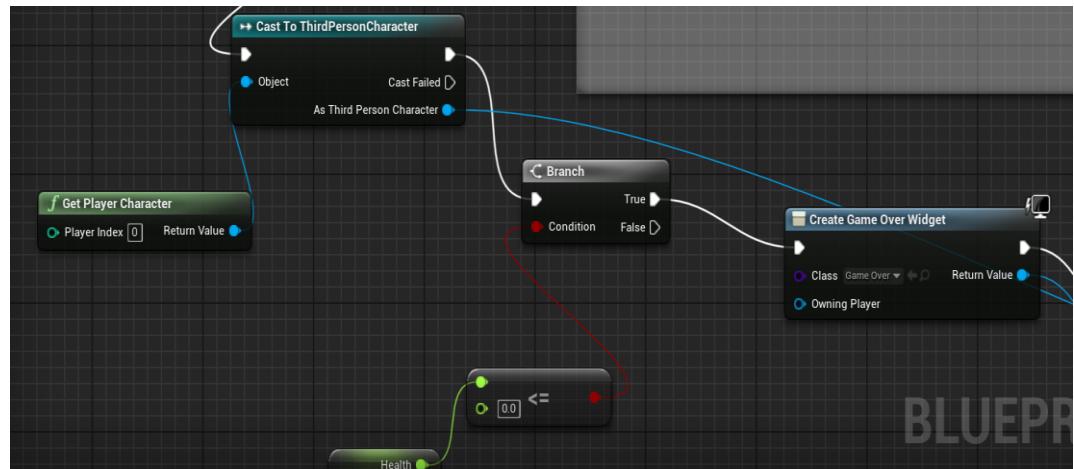
Armor regenerate



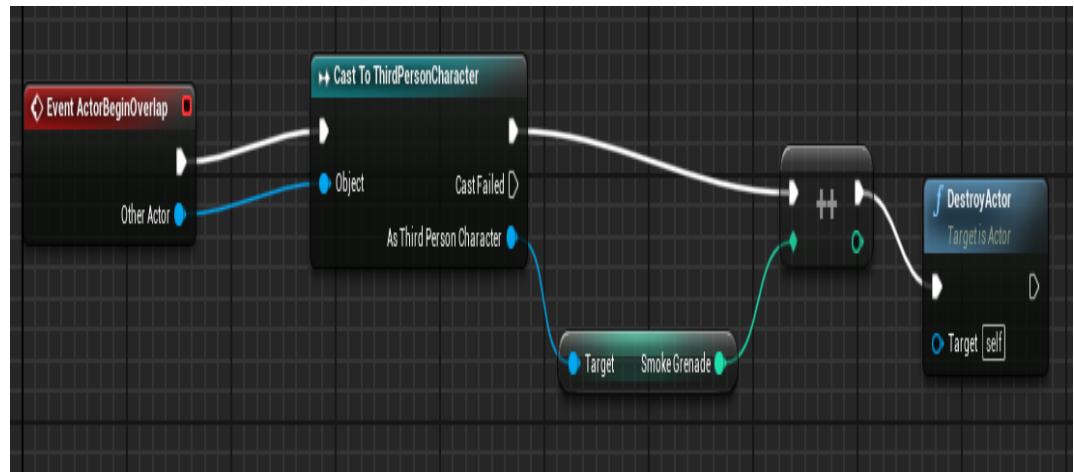
Dynamic crosshair



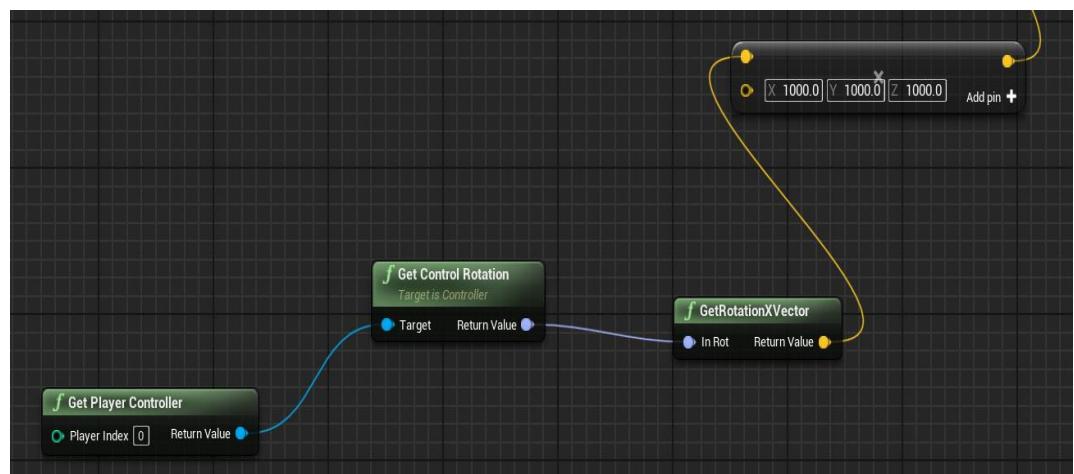
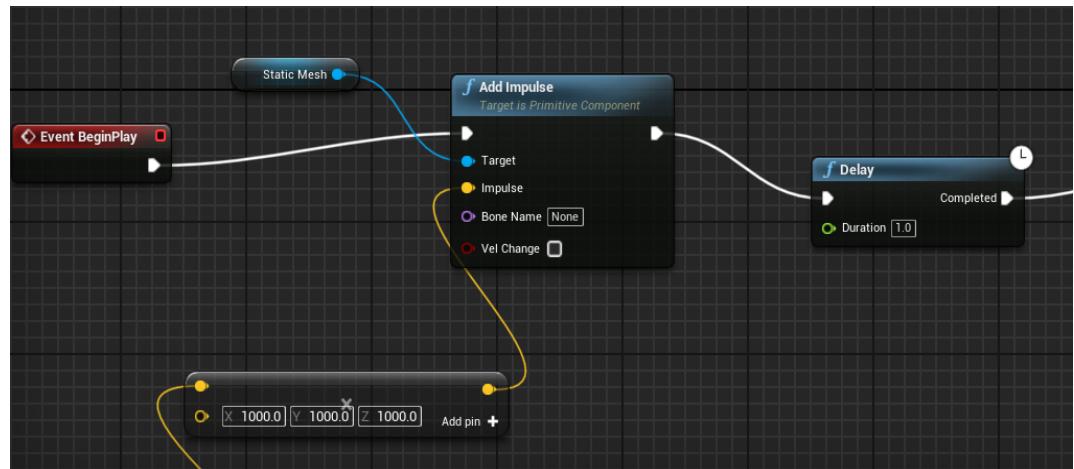
Game over

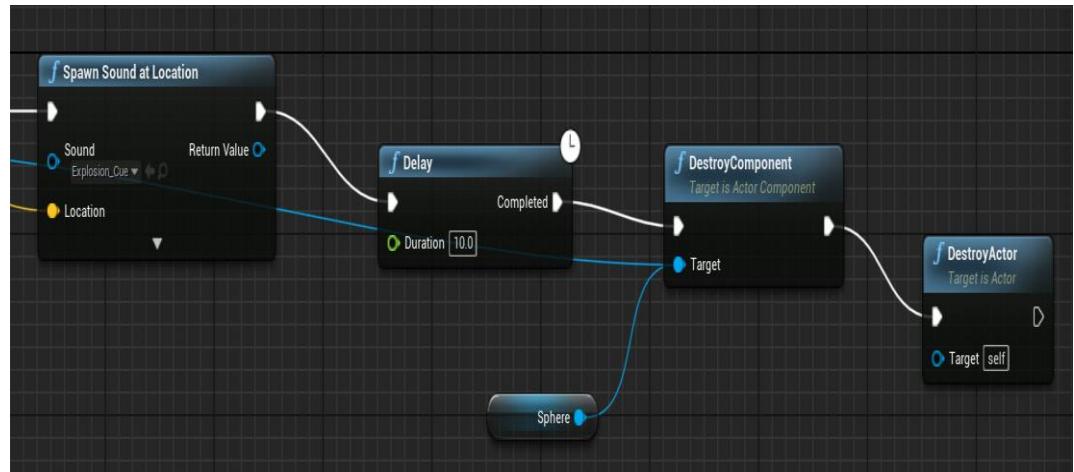
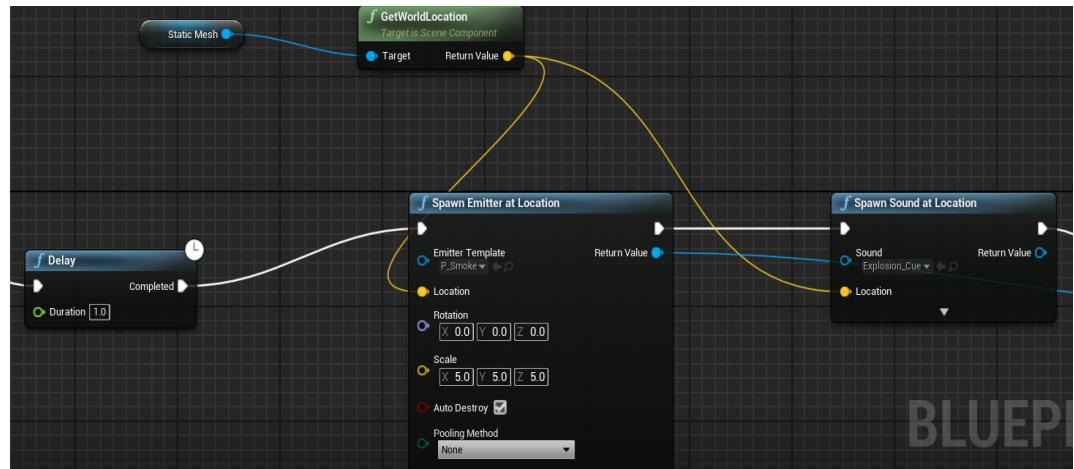


Smoke grenade pickup

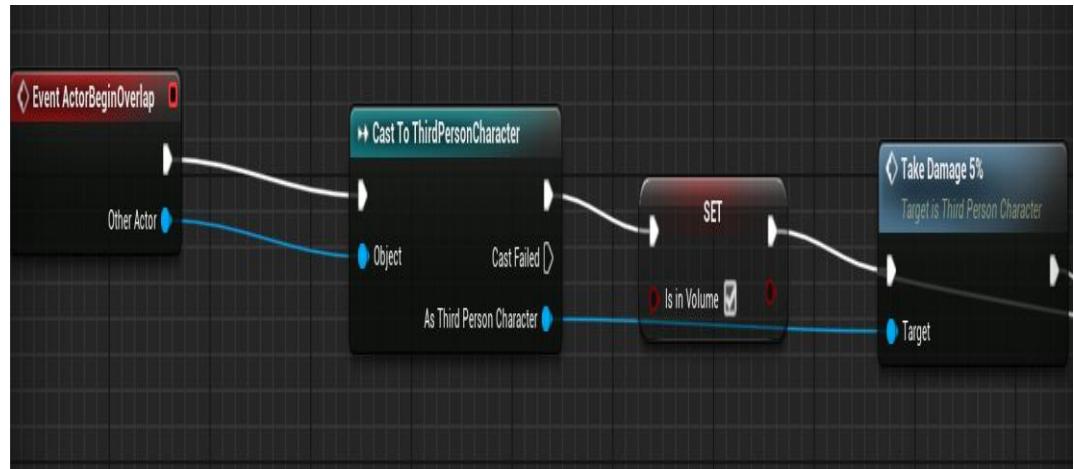


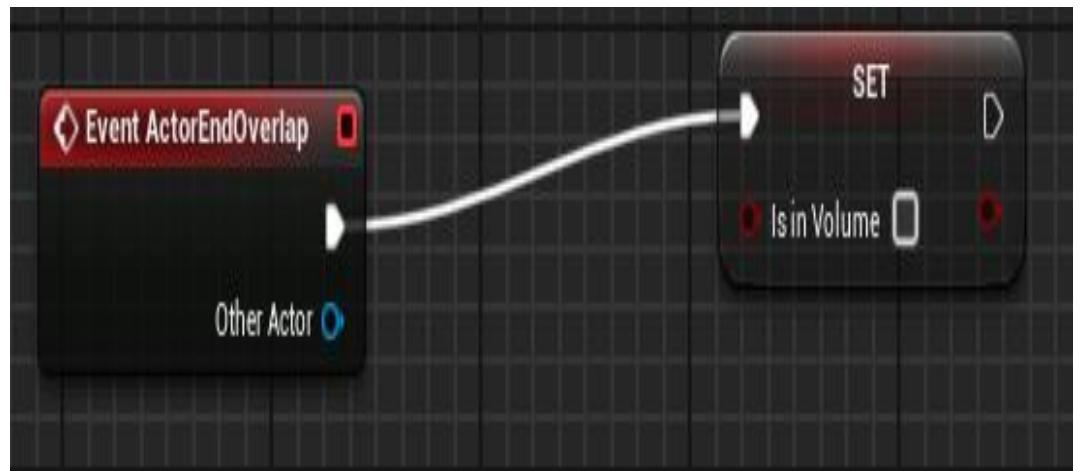
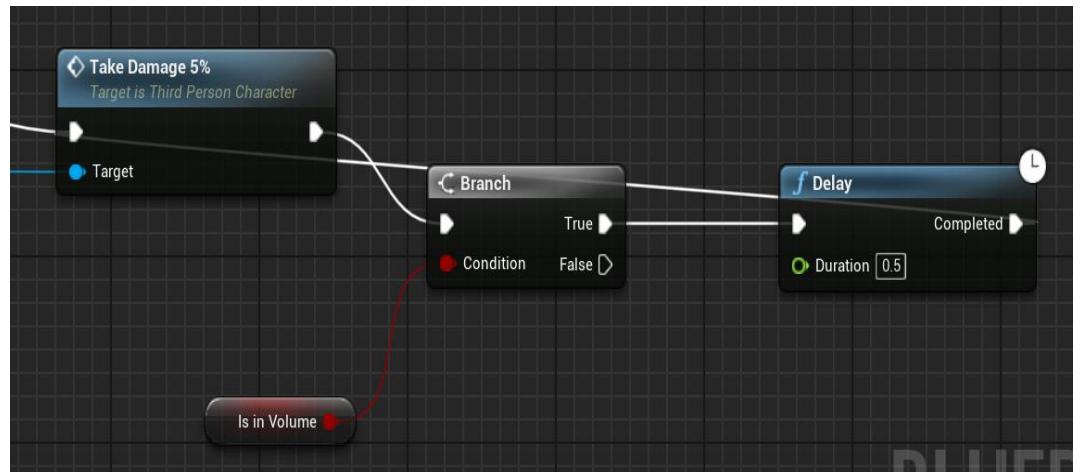
Smoke grenade effect



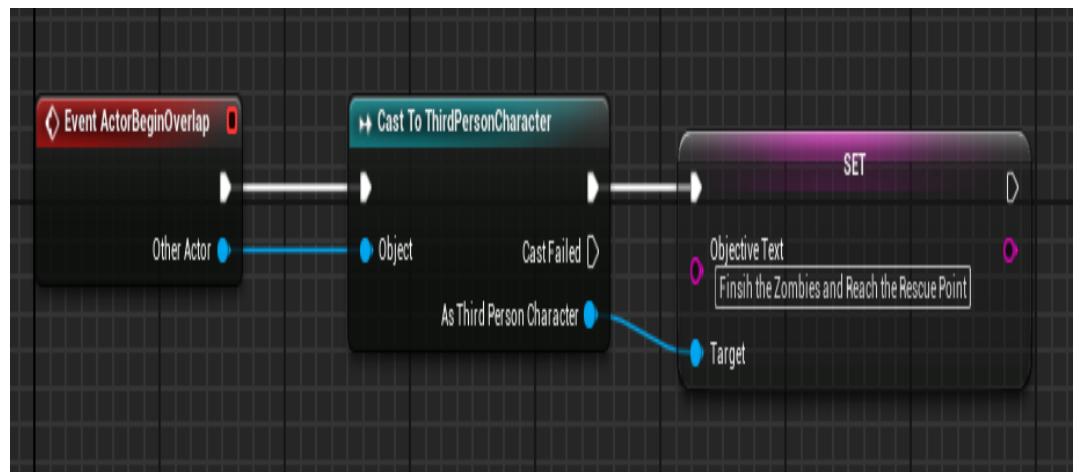


Damage zone/Pain volume

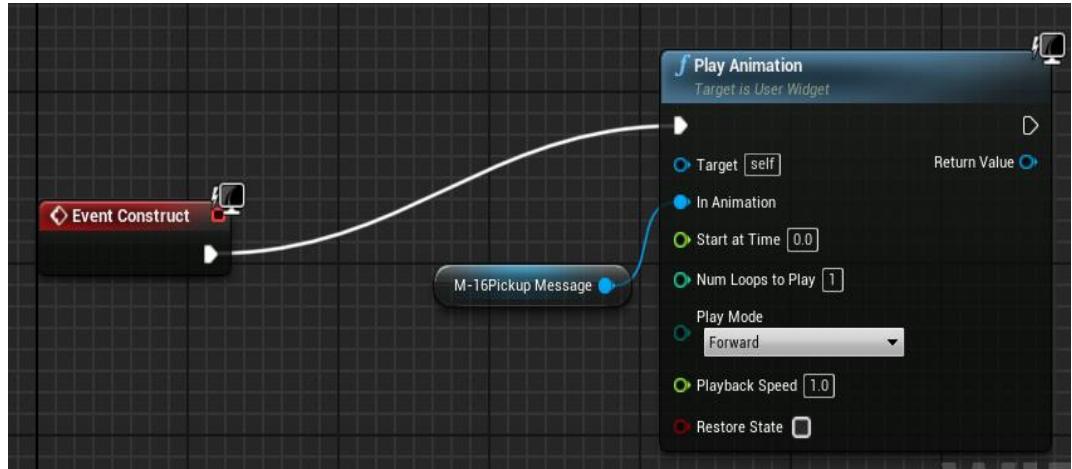




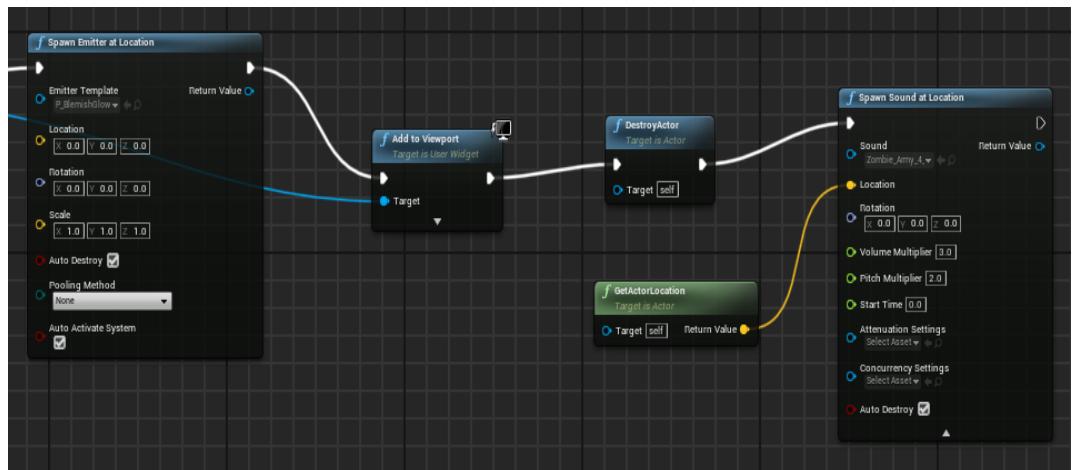
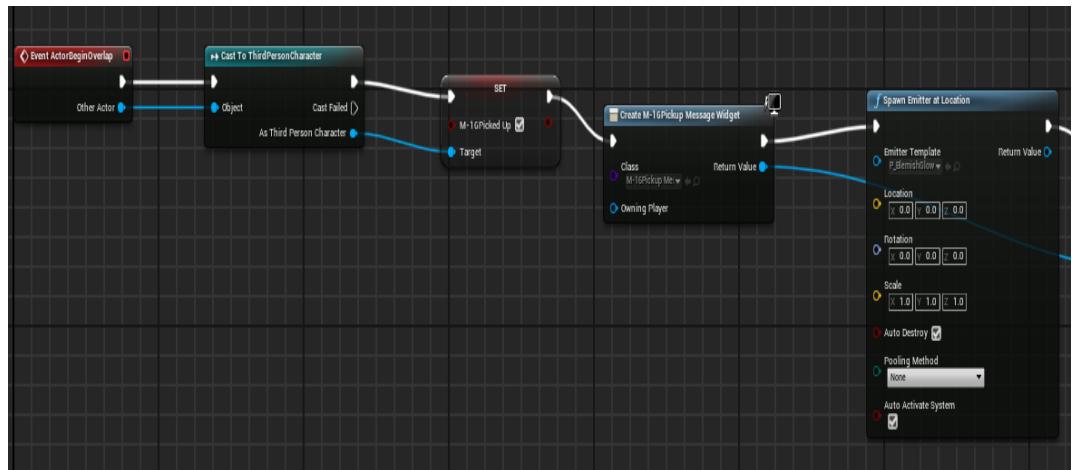
Mission1_VolumeBlueprint



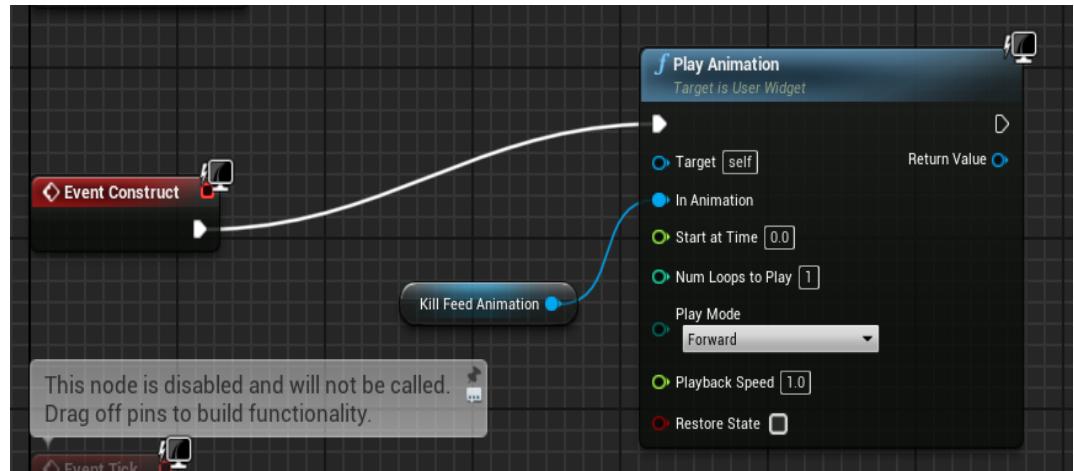
M-16PickupMessageBlueprint



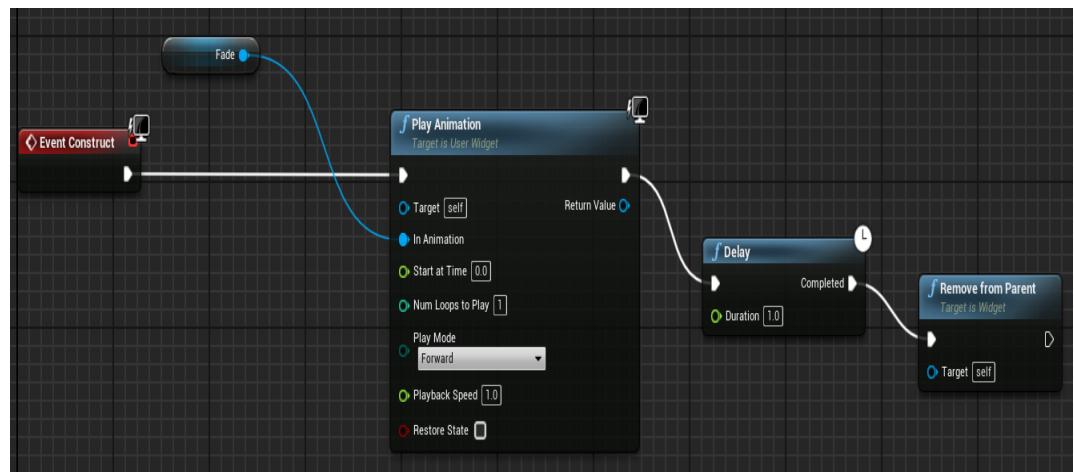
M-16PickupBlueprint



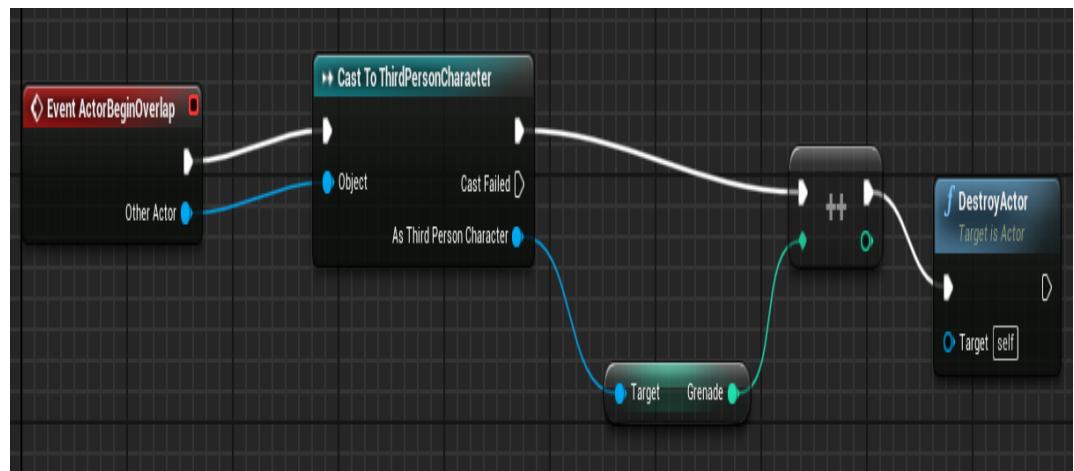
KillFeedAnimationBlueprint



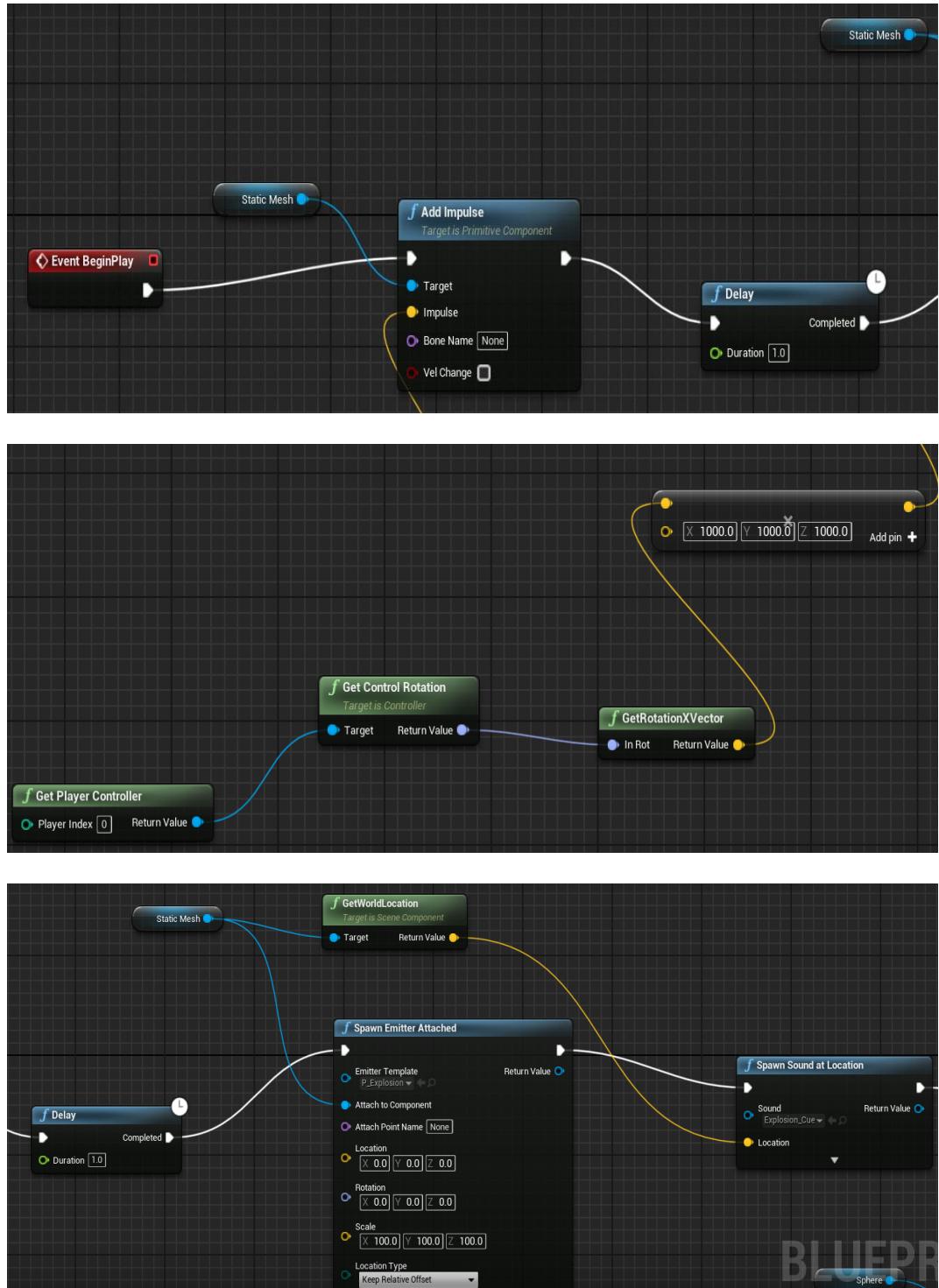
HitEffect Animation Blueprint

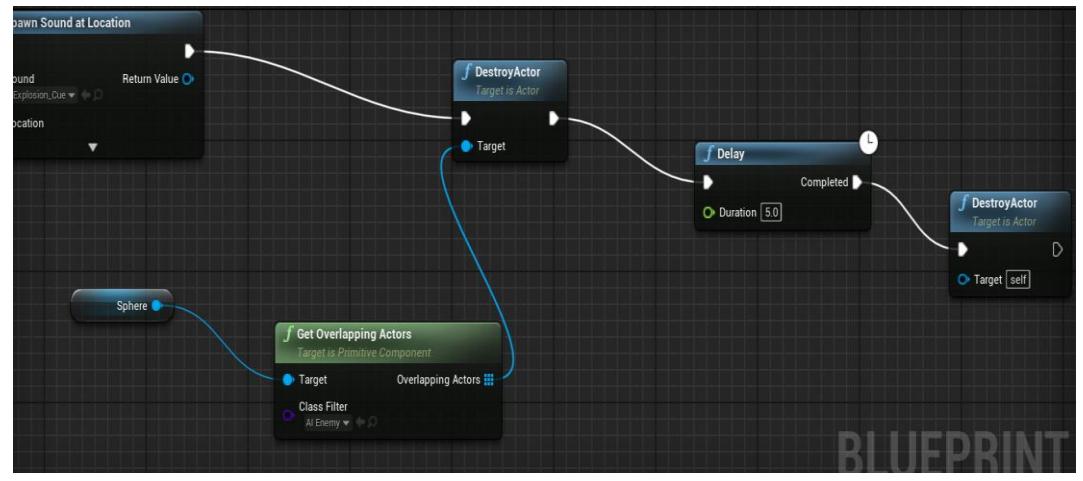


GrenadePickupBlueprint

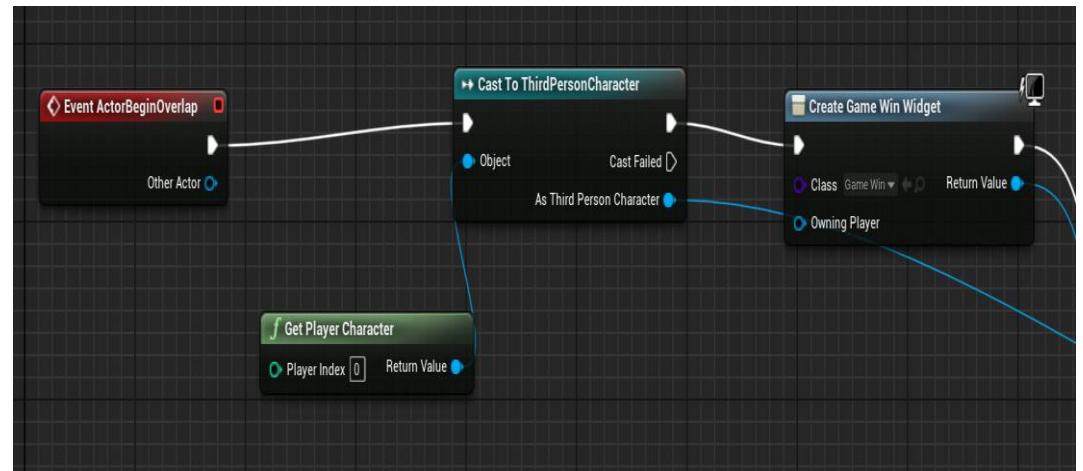


GrenadeBlueprint

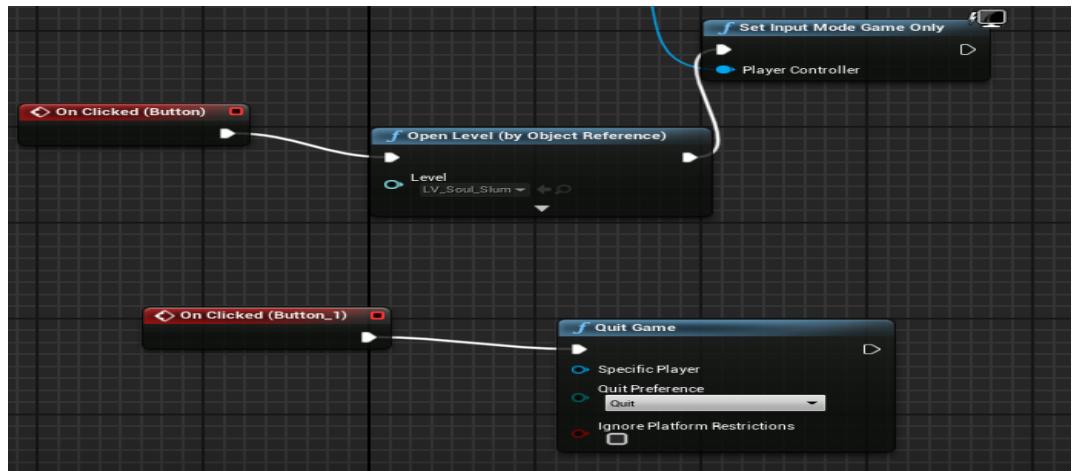
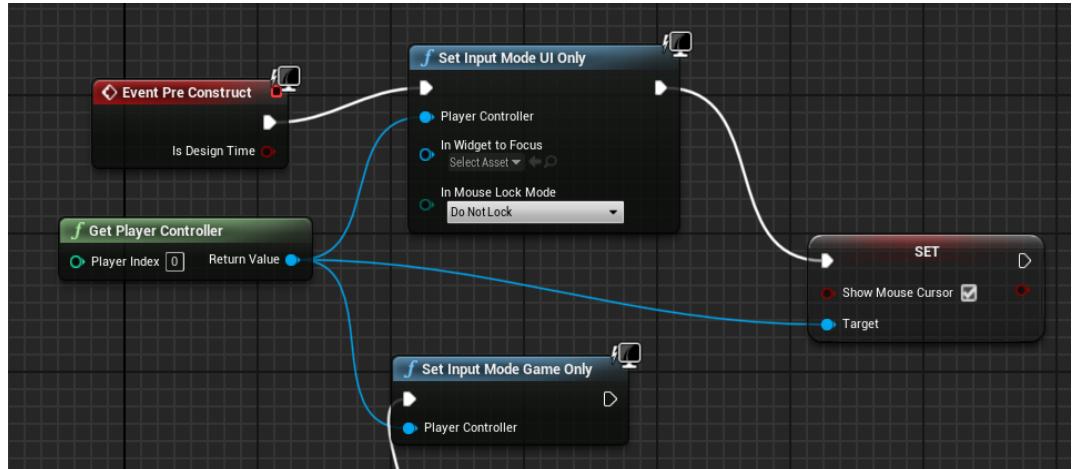




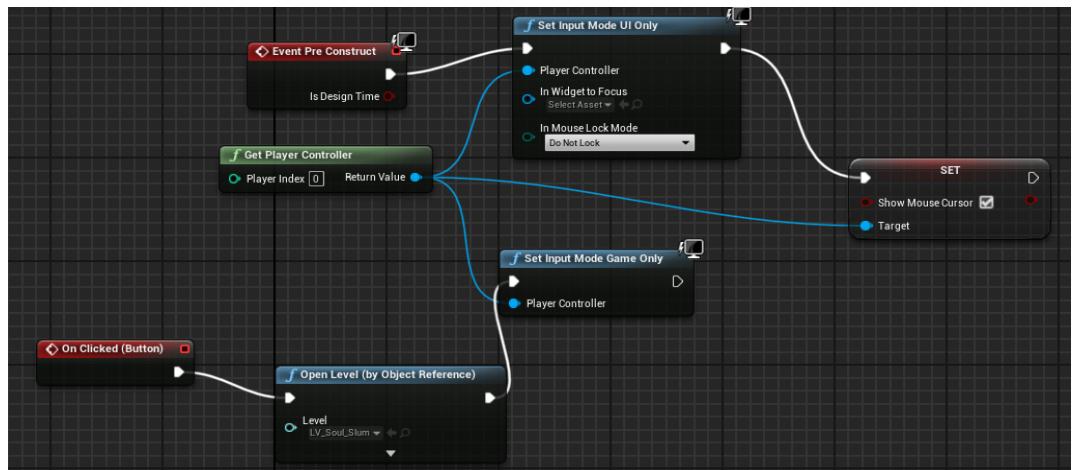
GoalPointBlueprint

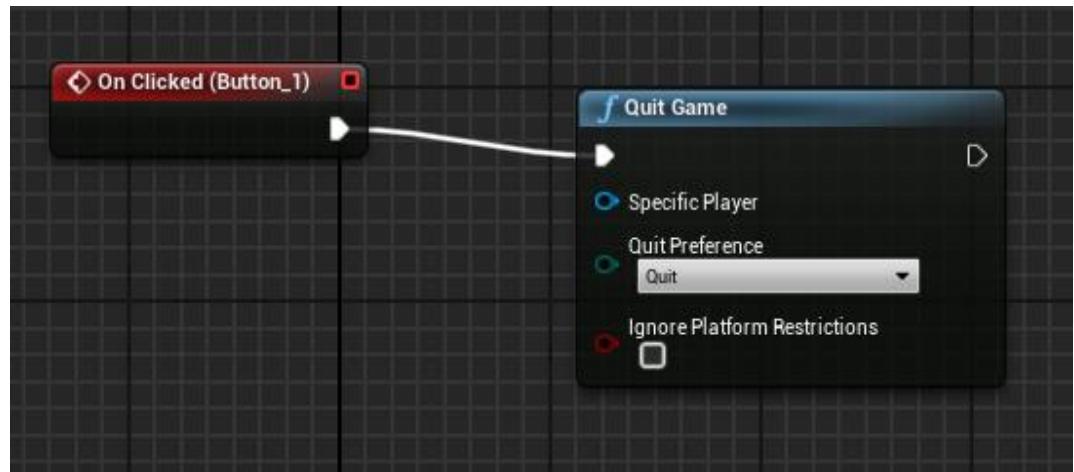


GameWinPopupBlueprint



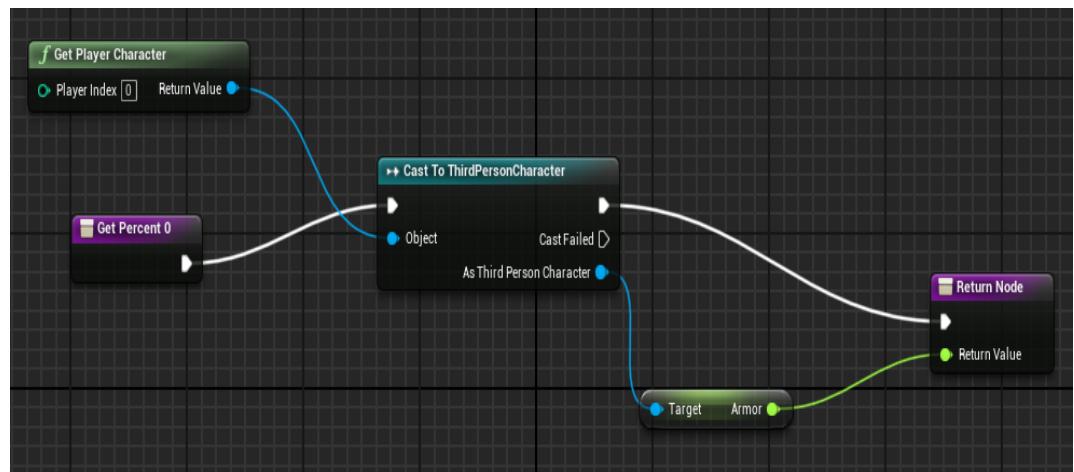
GameOverPopupBlueprint



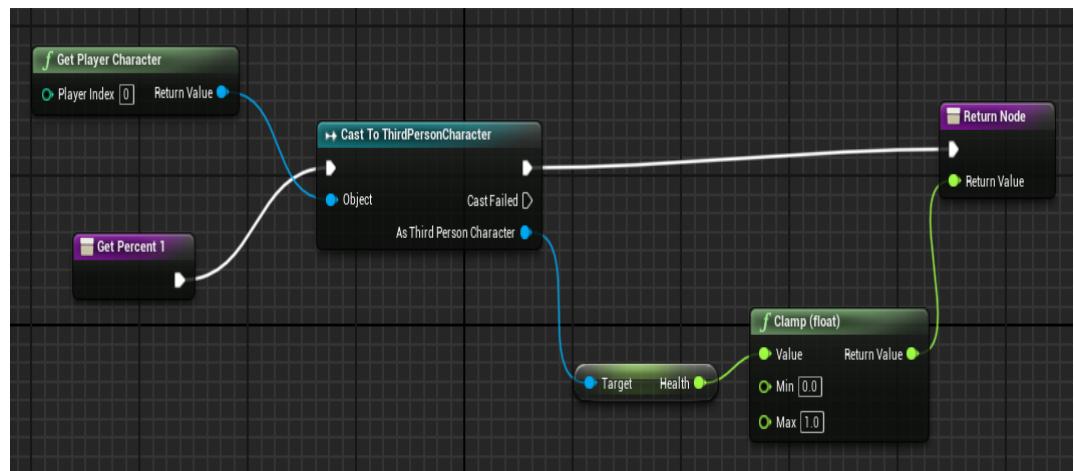


FPSUI Blueprint

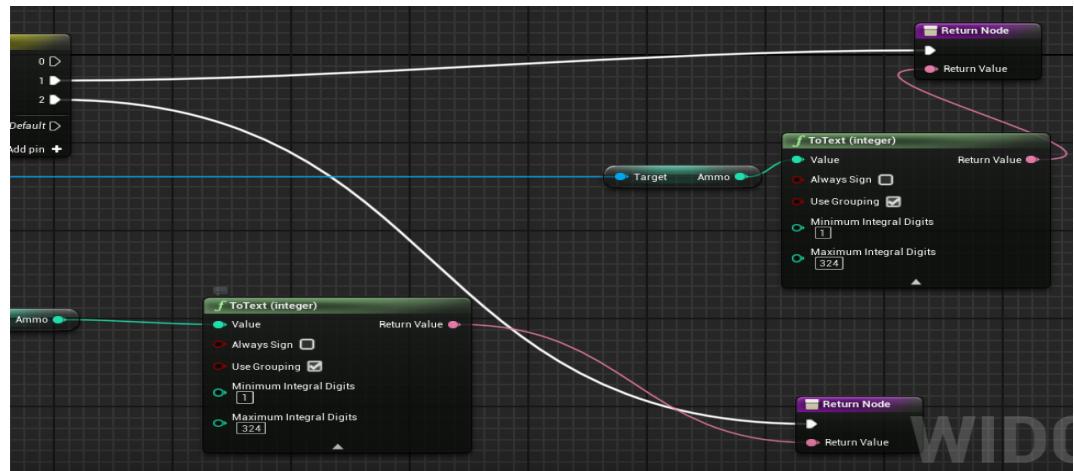
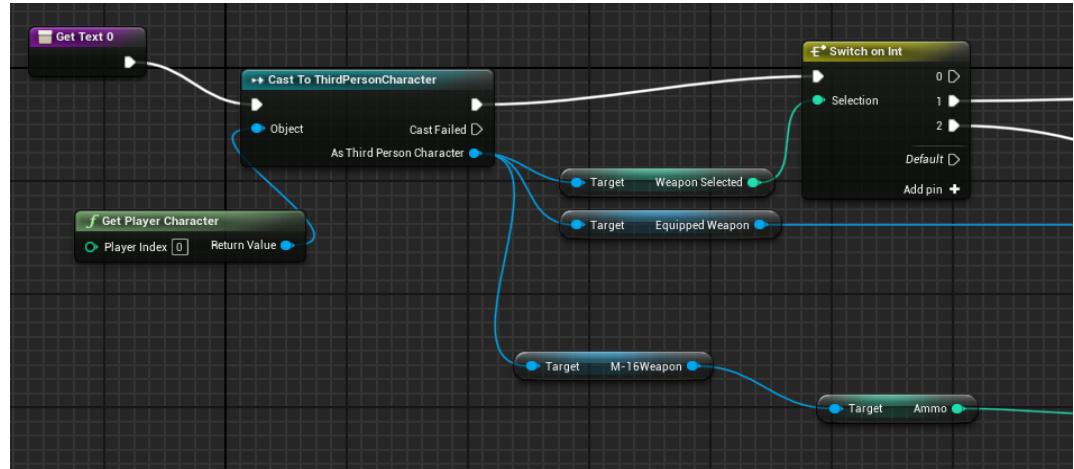
Displaying Armor Value



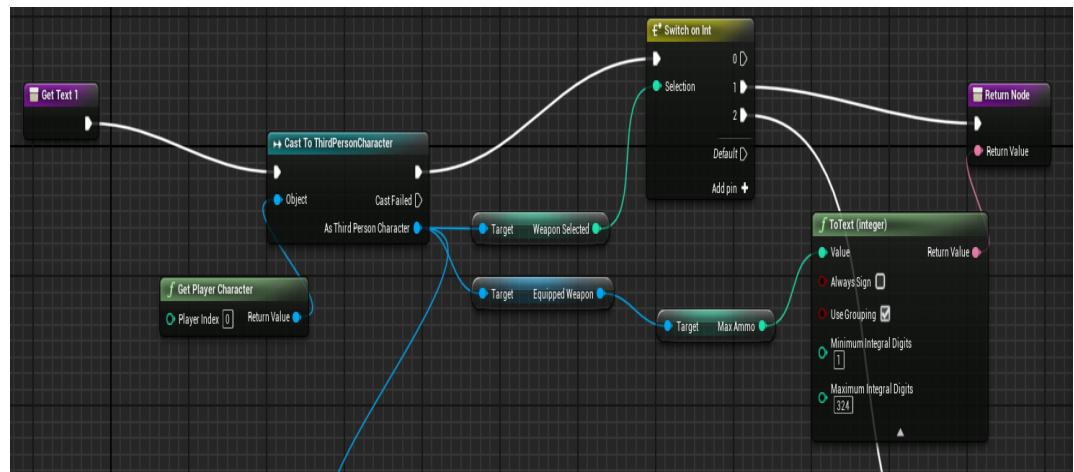
Displaying Health Value

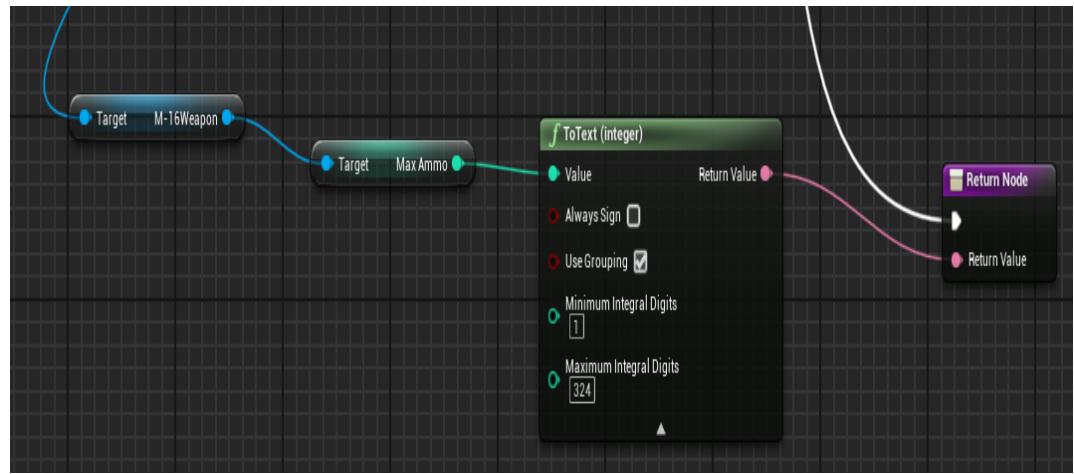


Displaying Ammo Count

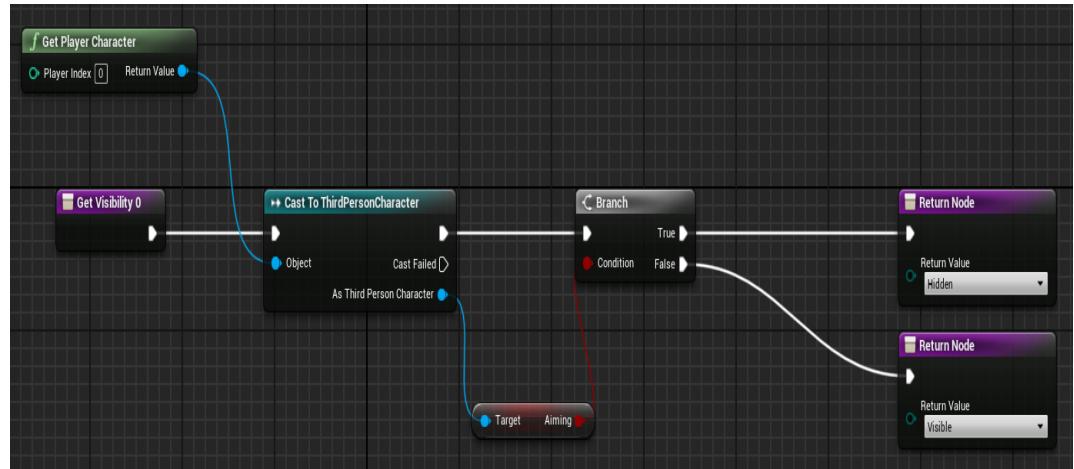


Displaying Remaining Ammo of Player

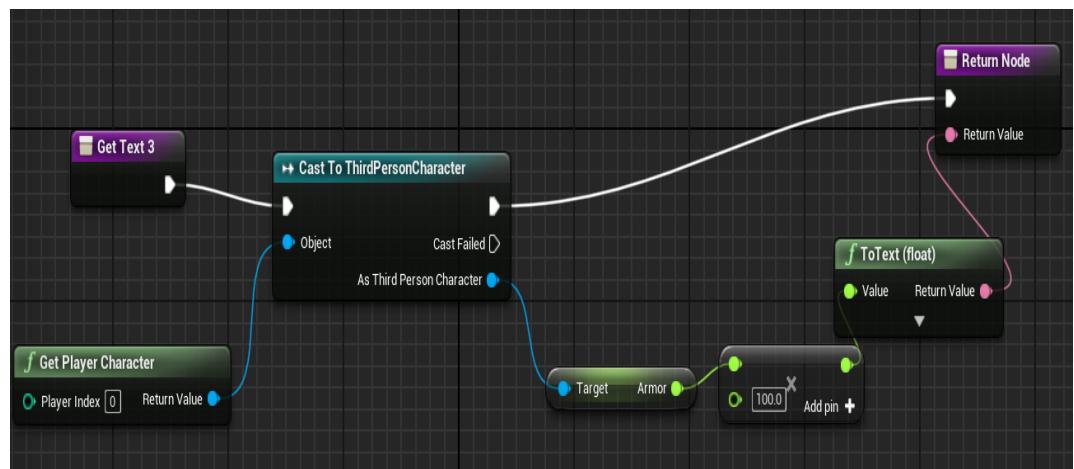




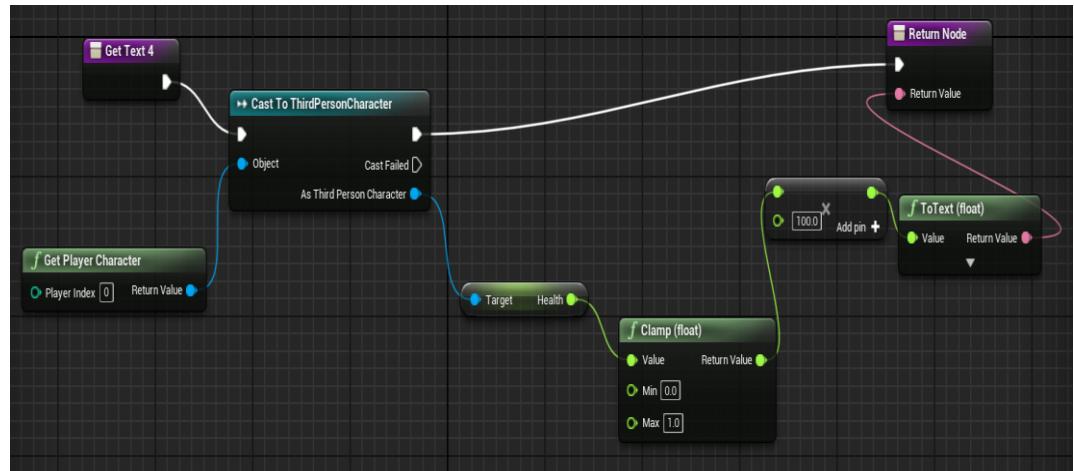
Crosshair visibility while aiming



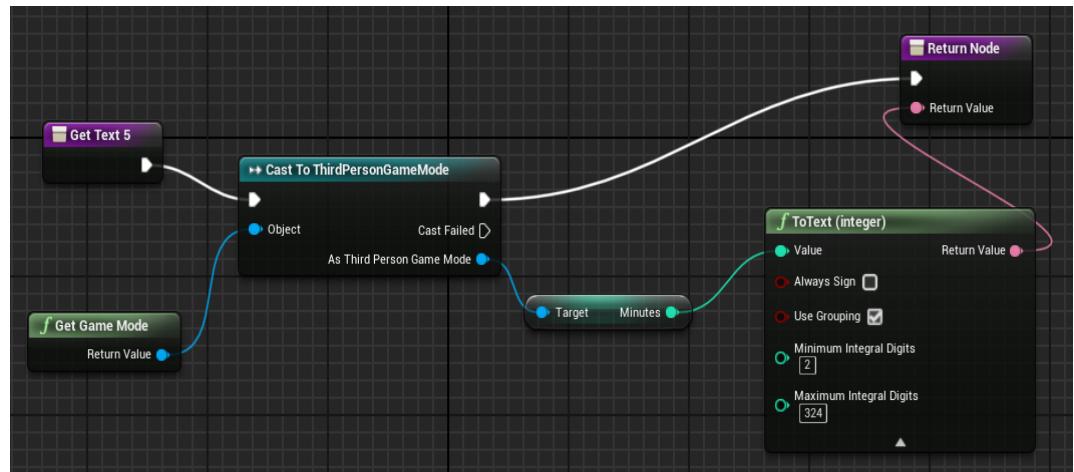
Armor value calculation and display



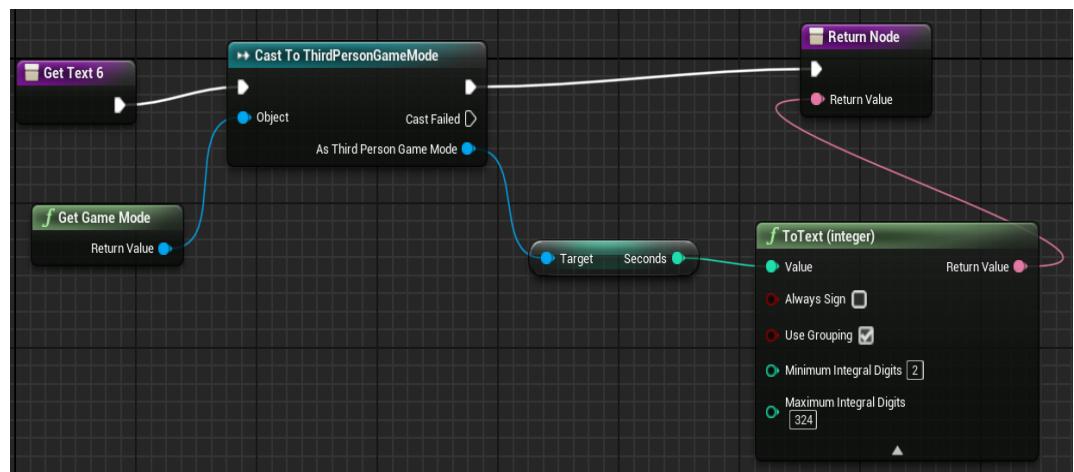
Health value calculation and display



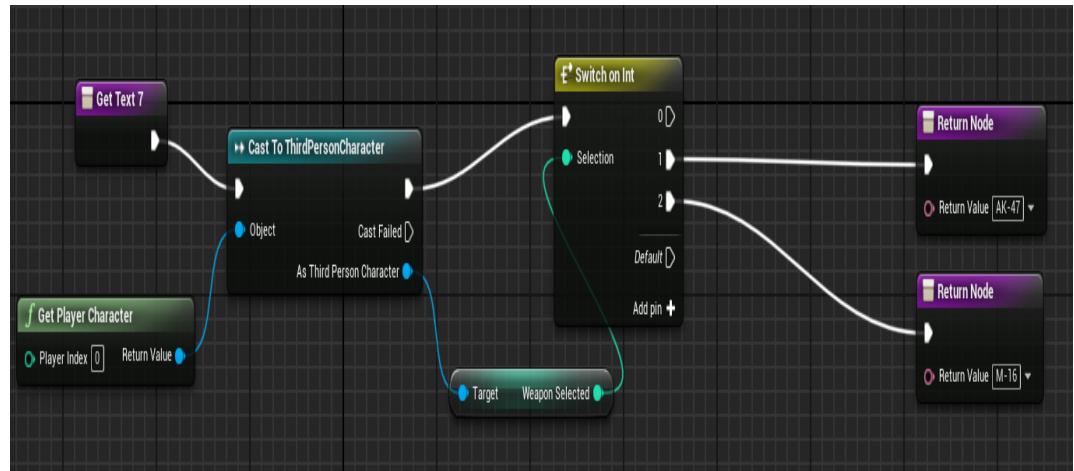
Match timer Minutes display



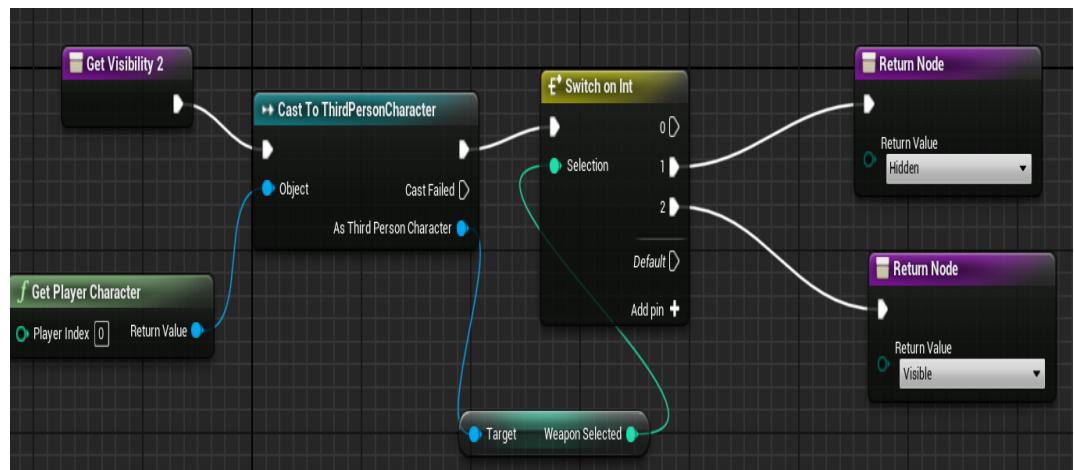
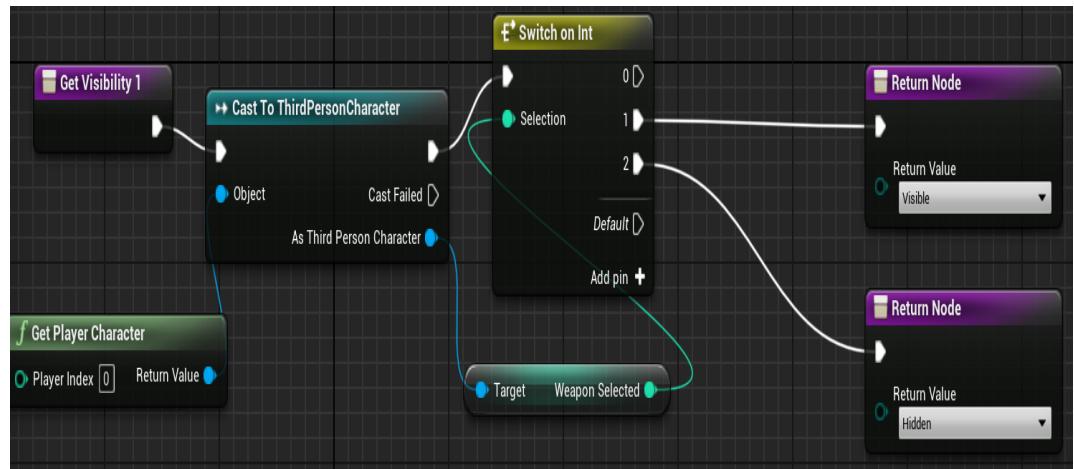
Match timer Seconds display



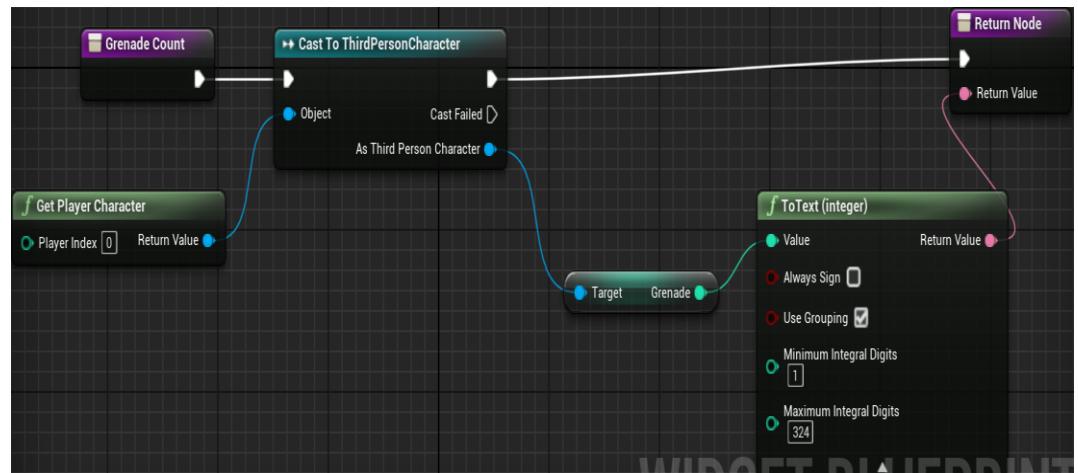
Weapon Name Display



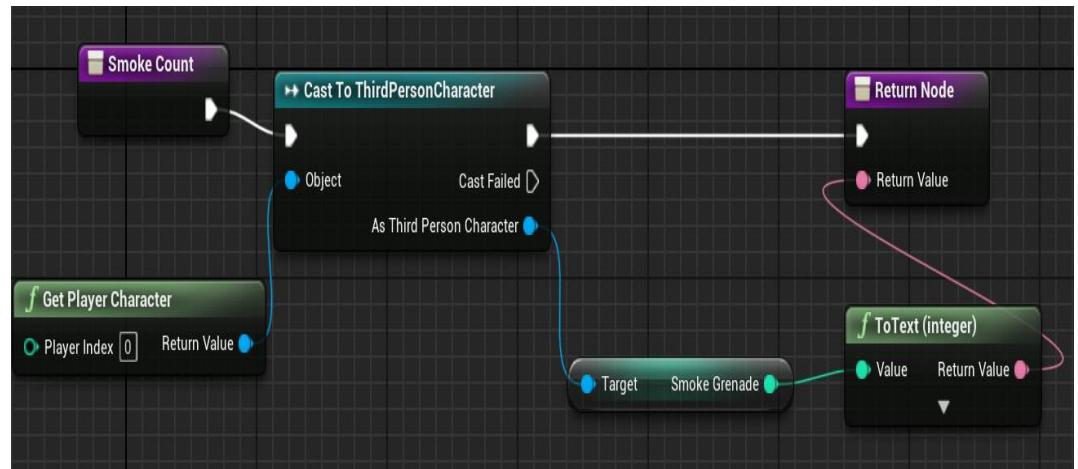
Weapon Icon Visibility



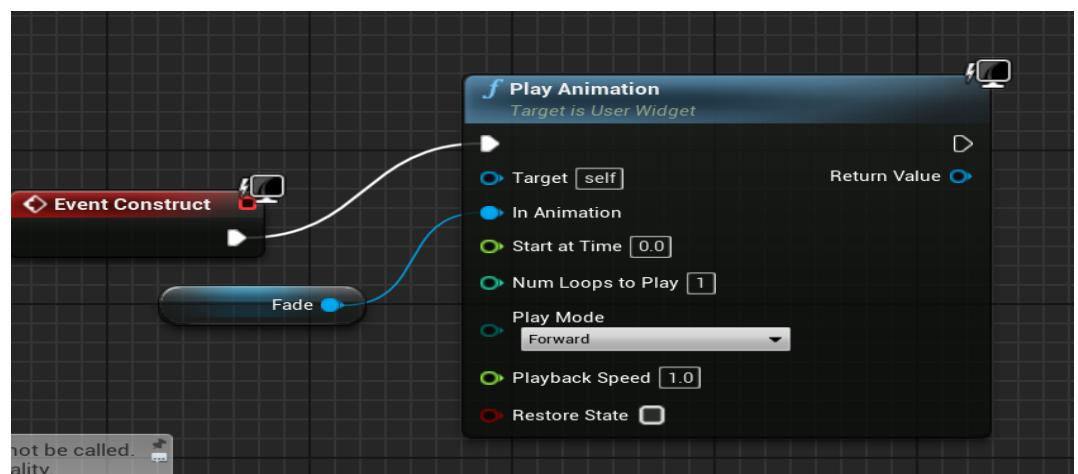
Grenade Count



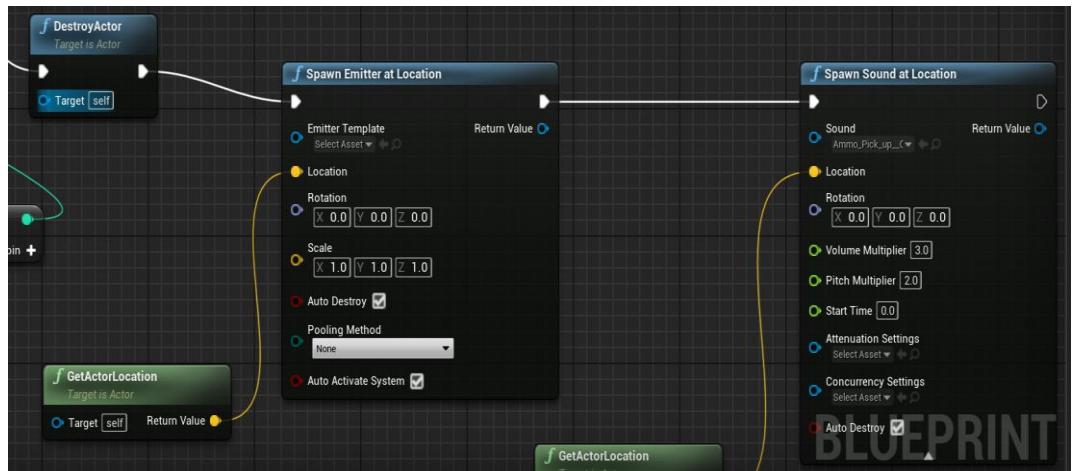
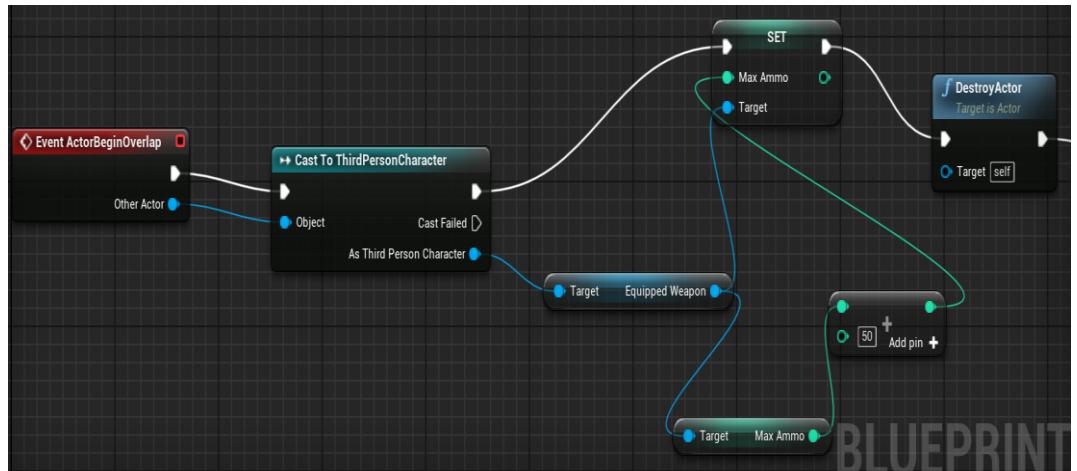
Smoke grenade count



Damage Effect

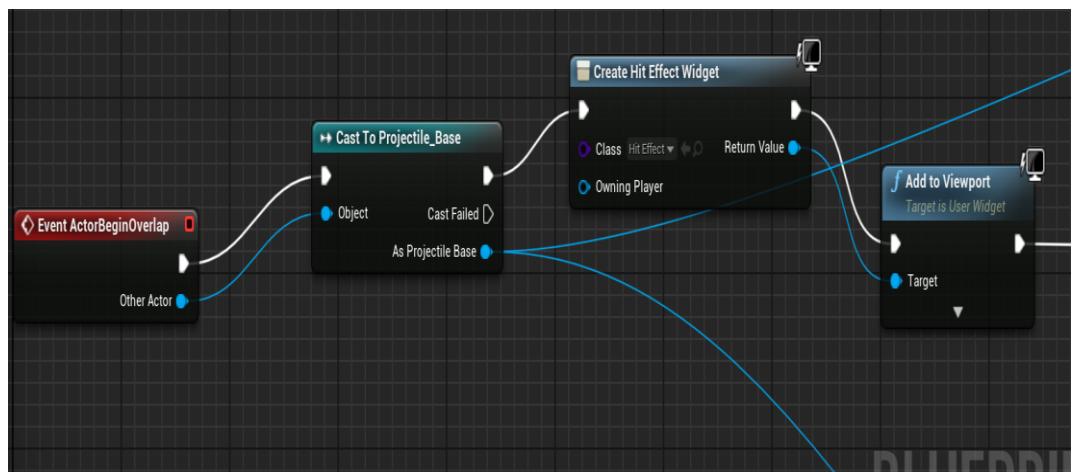


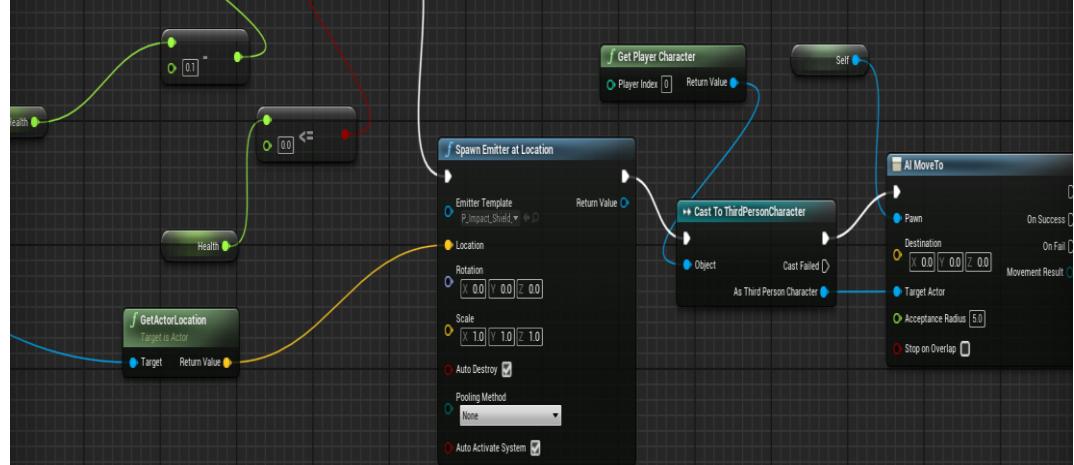
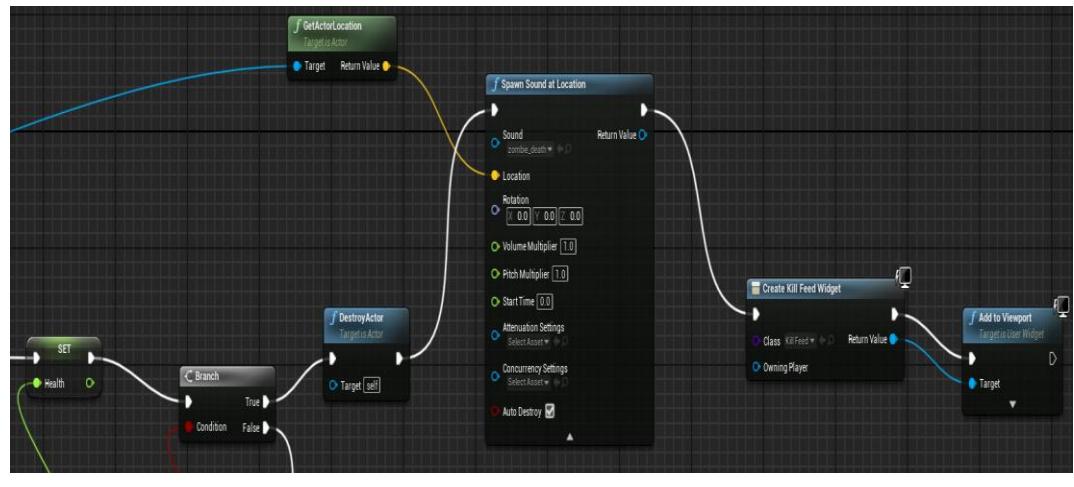
Ammo Pickup



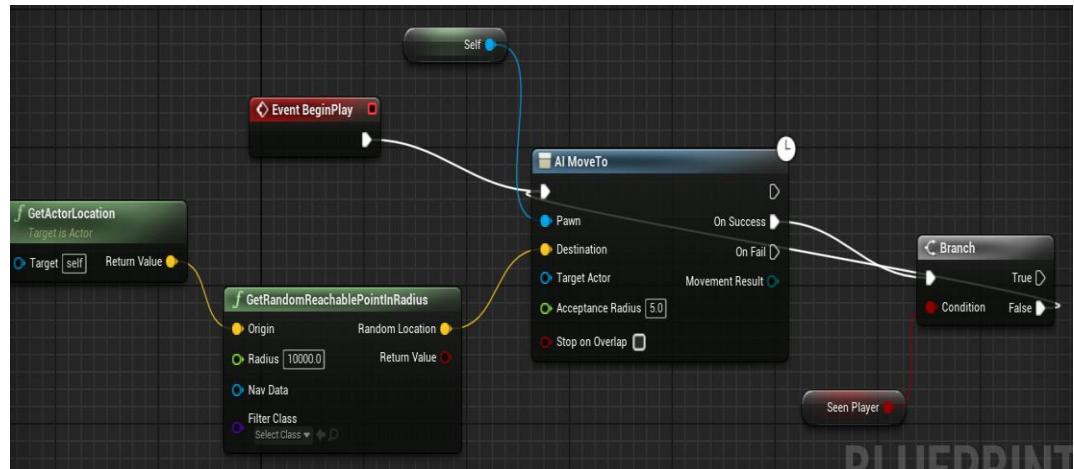
Zombie Blueprint

Zombie chasing on hit

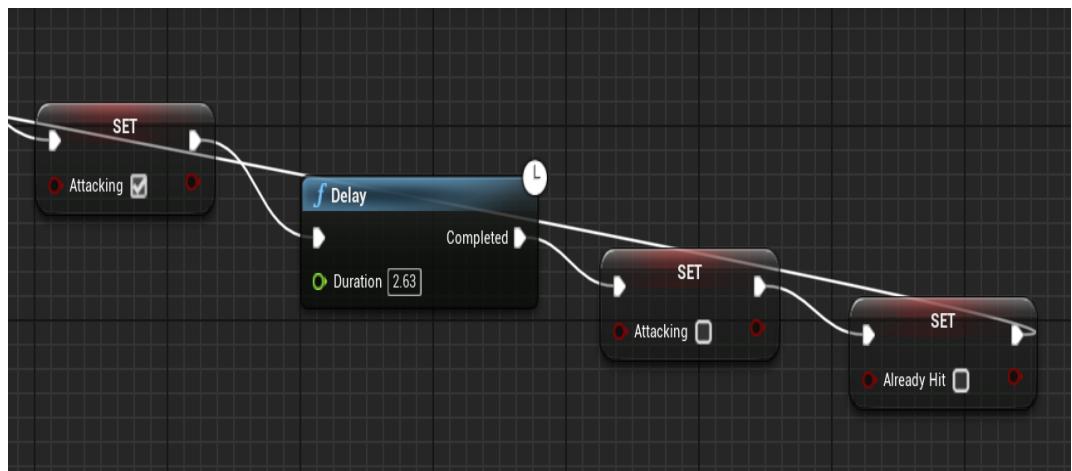
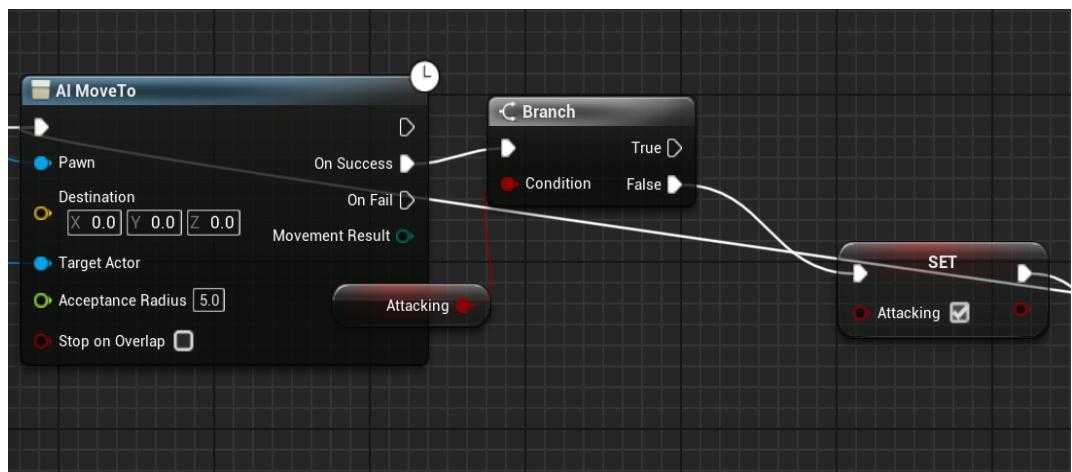
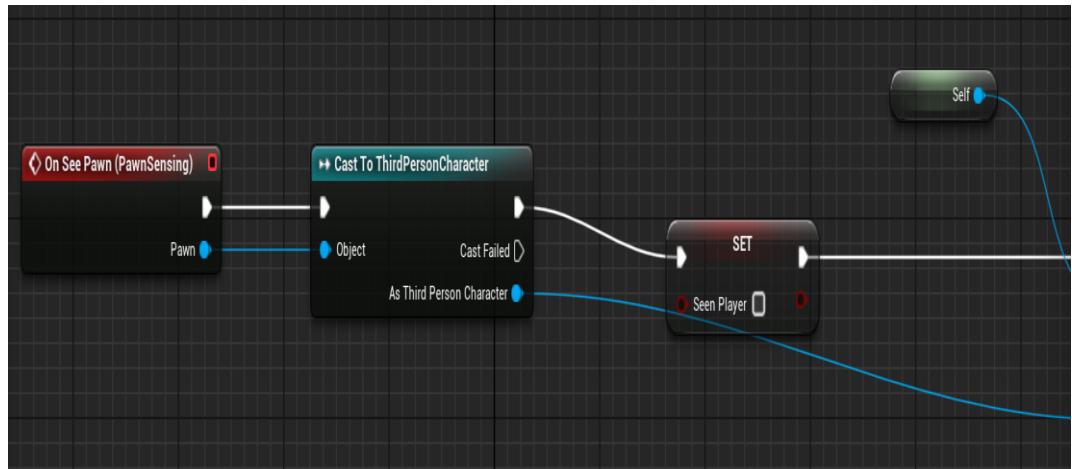




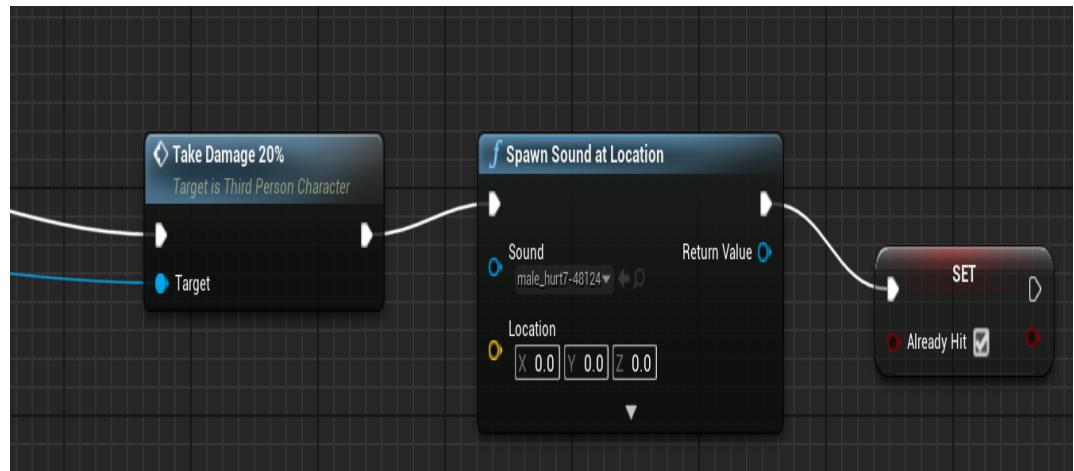
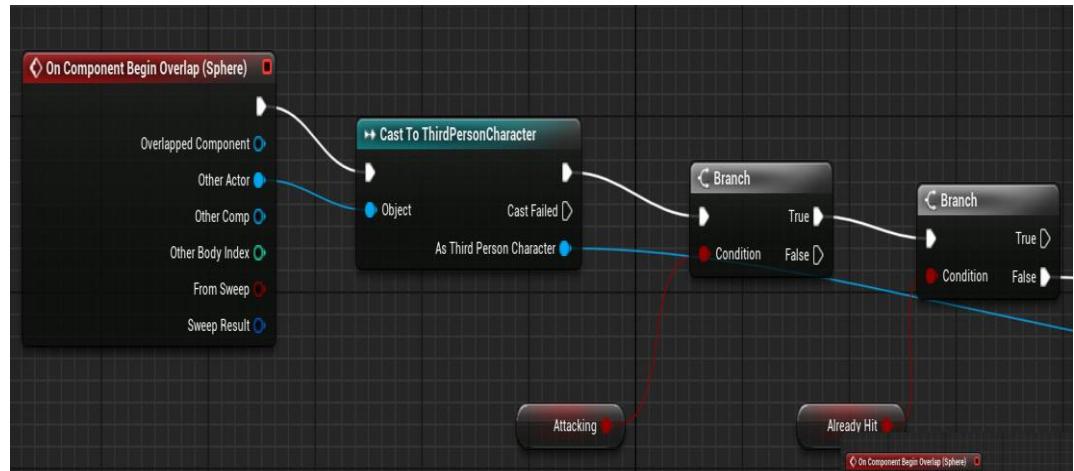
Zombie randomly moving



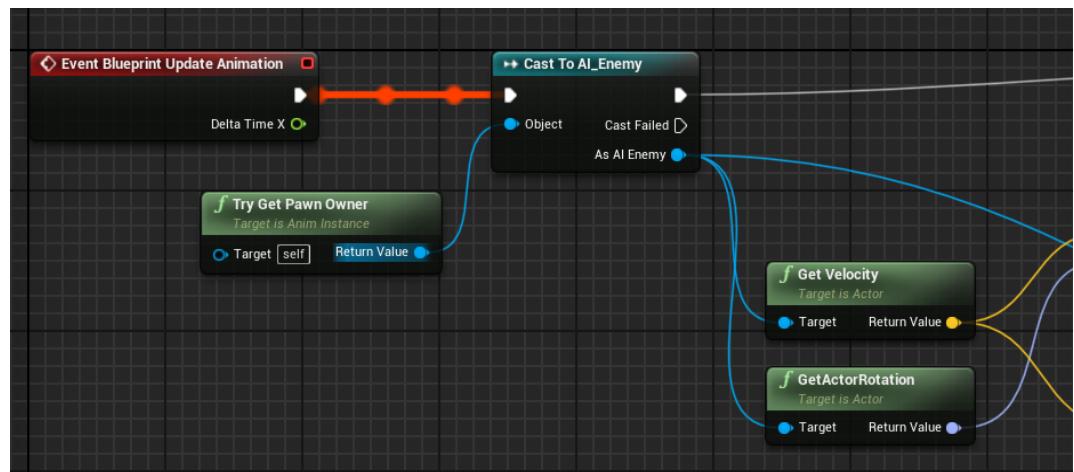
Zombie movement on sensing player

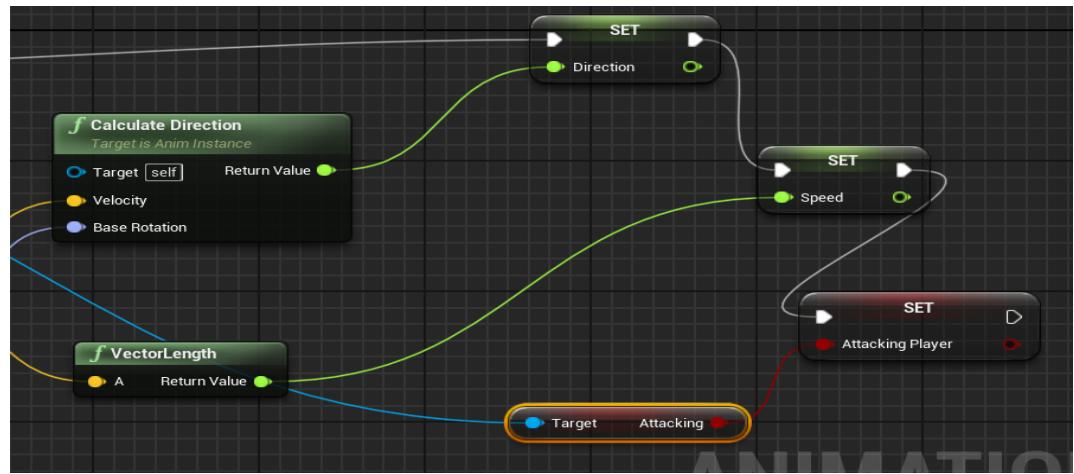


Zombie damaging the player

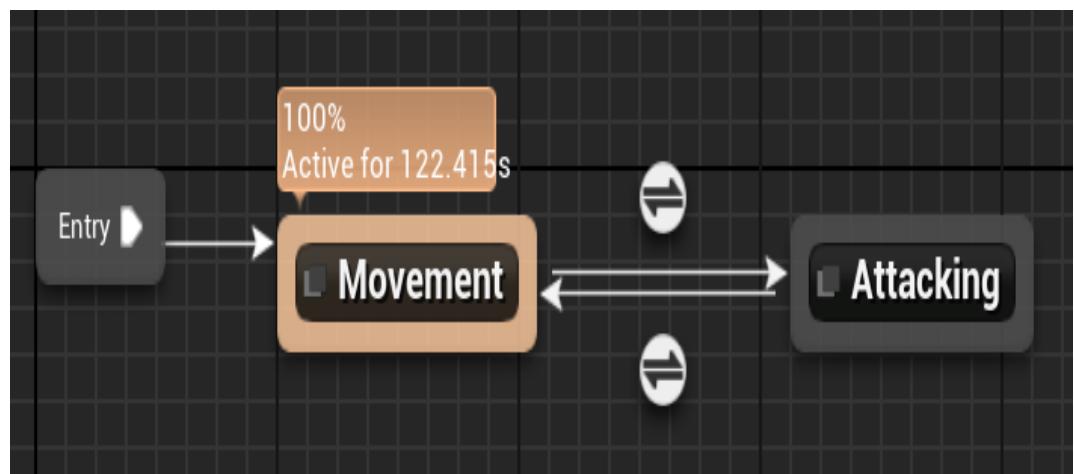
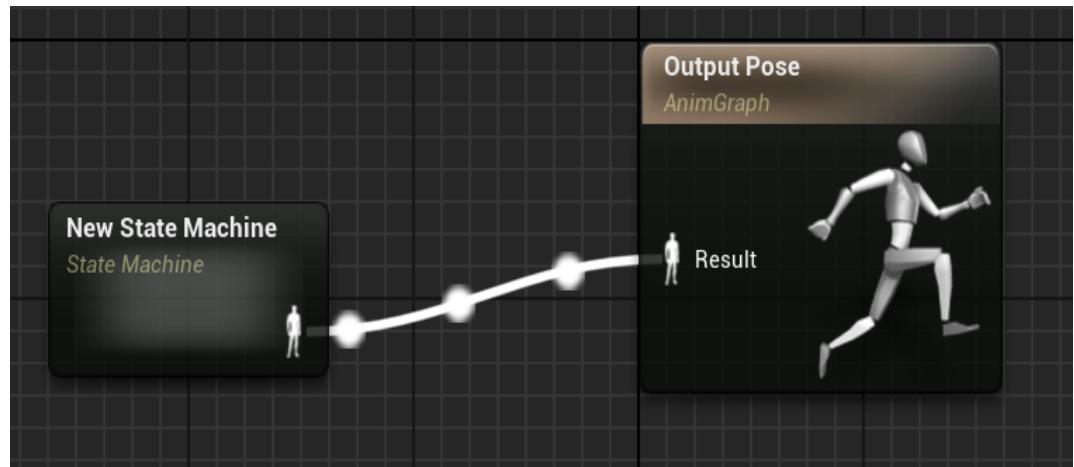


Zombie animation blueprint

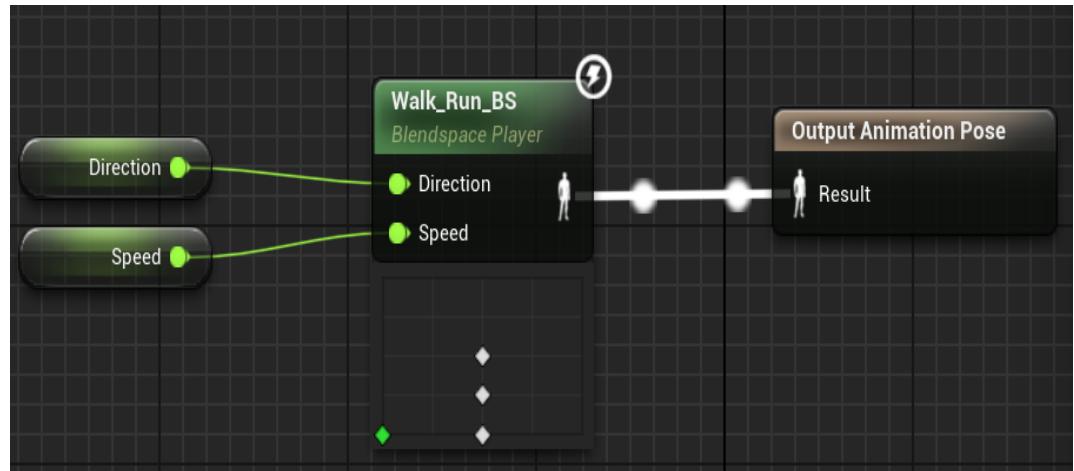




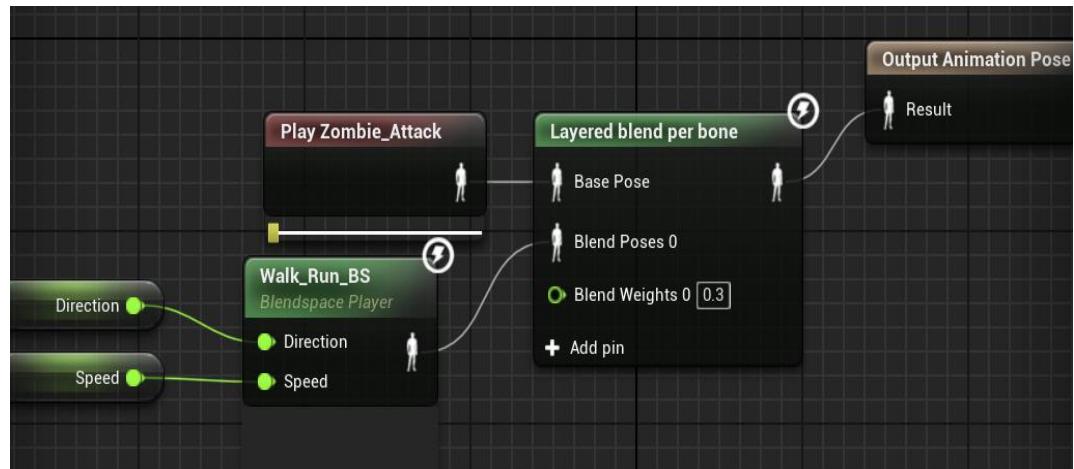
Zombie animation state Graph



Movement state



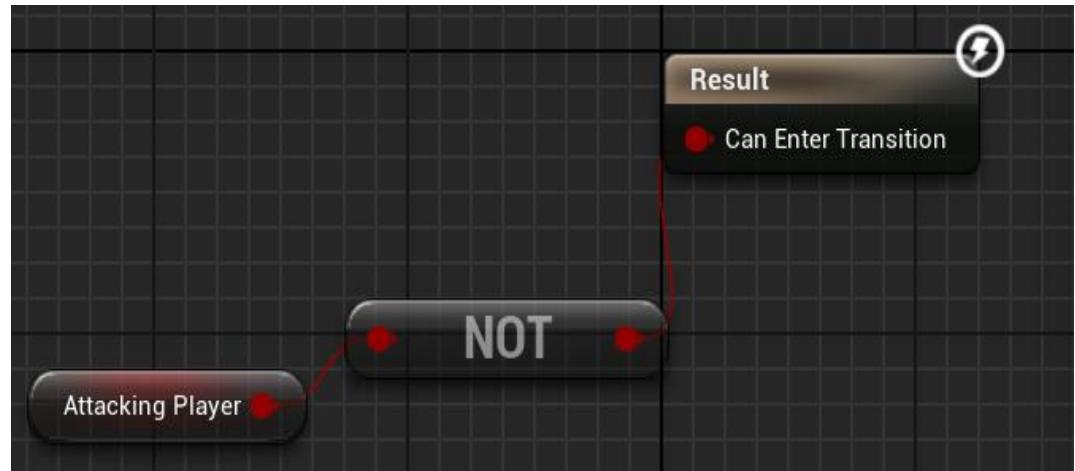
Attacking state



Movement to attacking rule

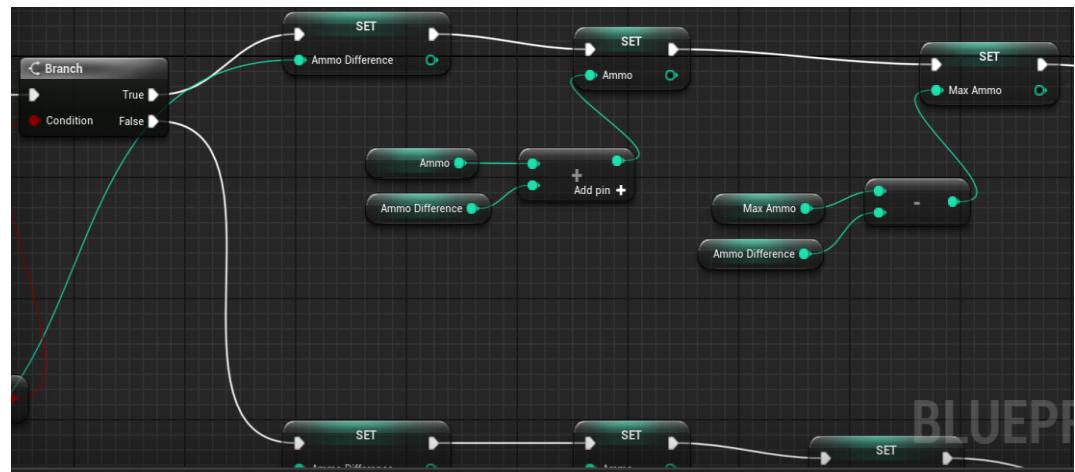
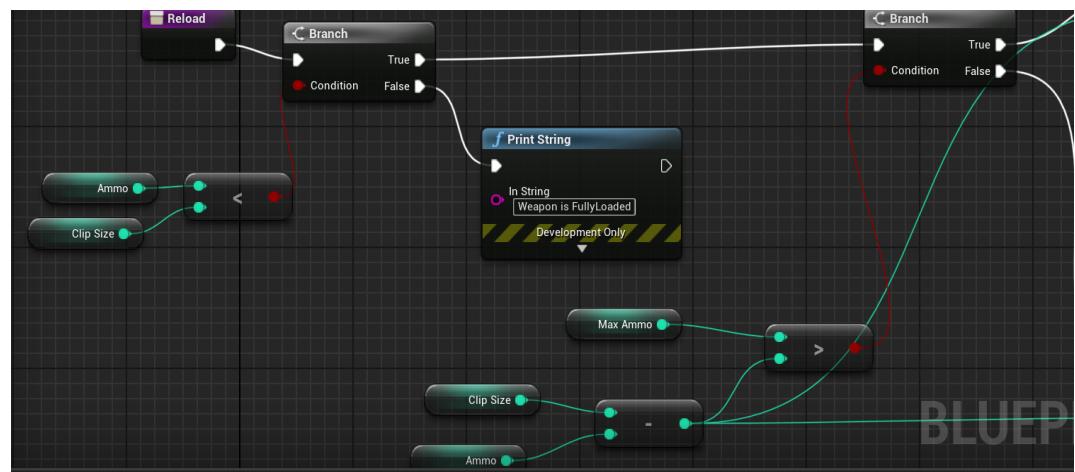


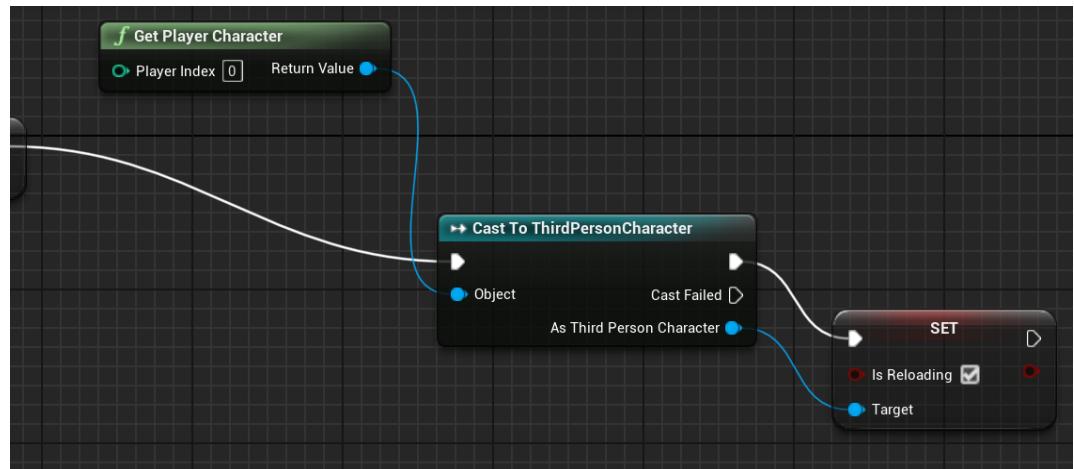
Attacking to movement rule



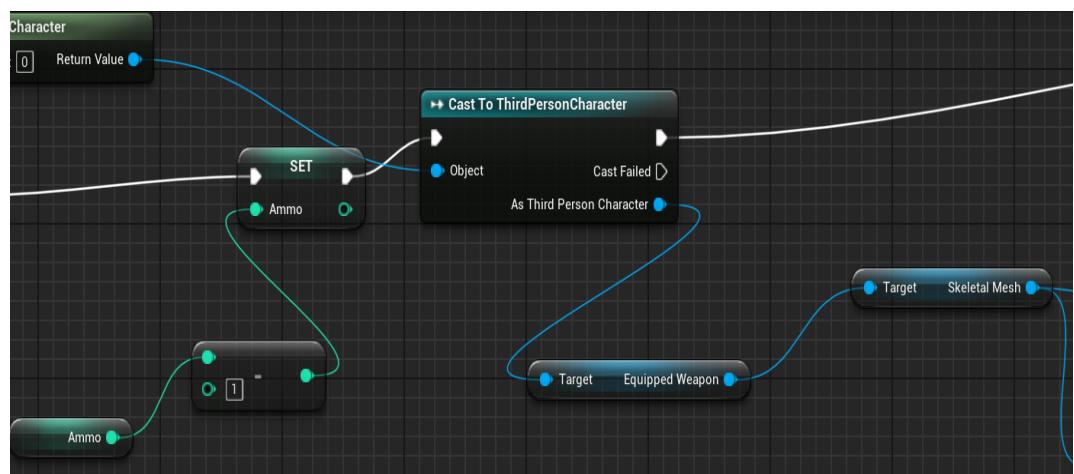
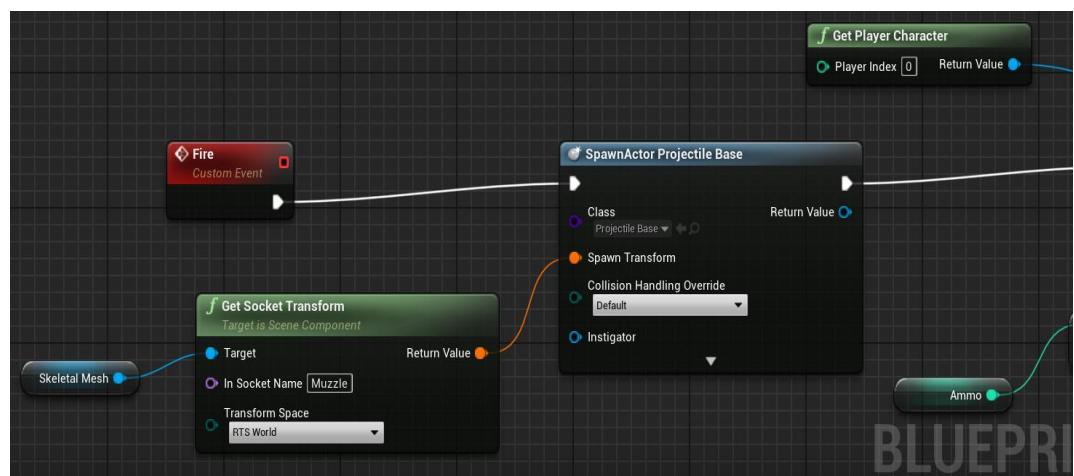
Ak-47 Weapon Base Blueprint

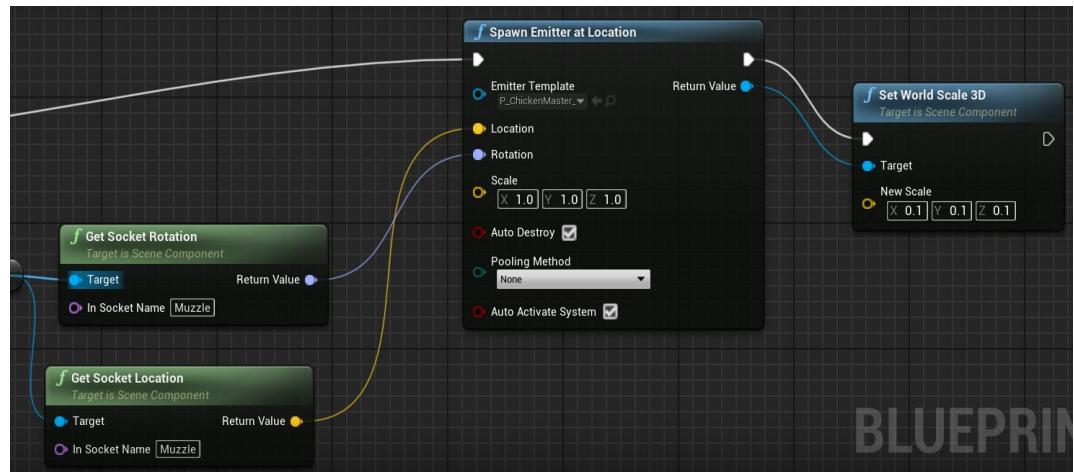
Reload function





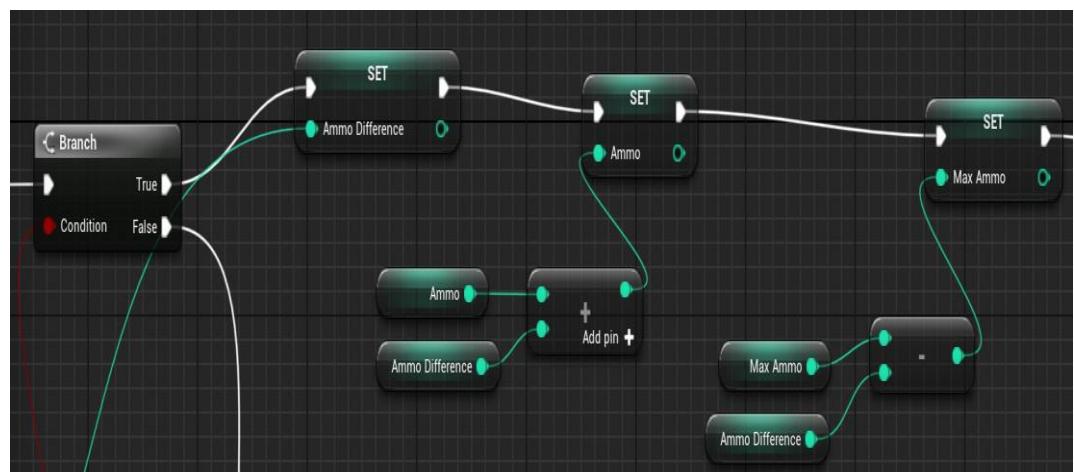
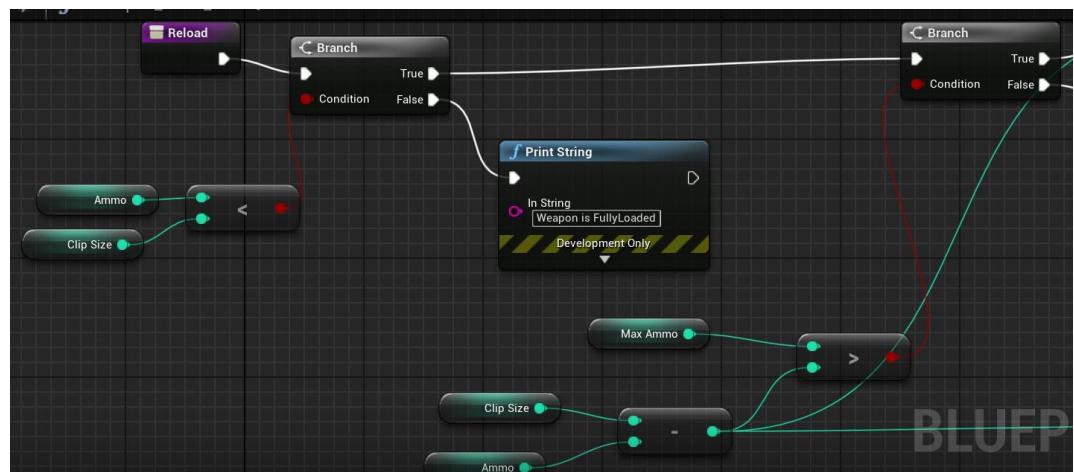
Main event graph of Ak-47

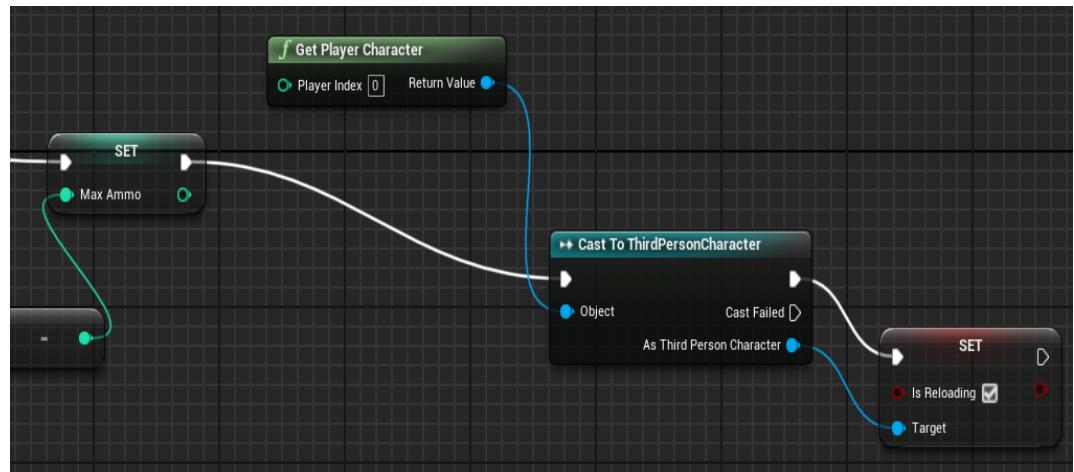




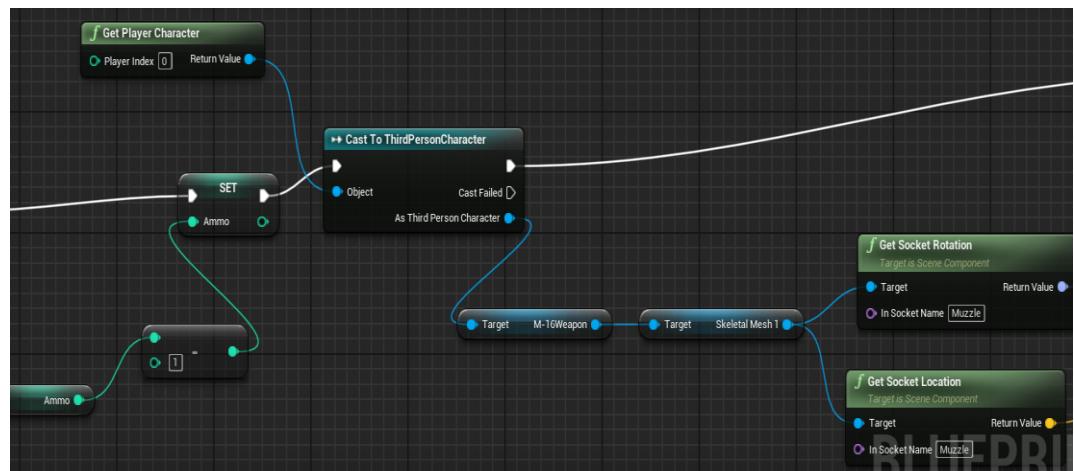
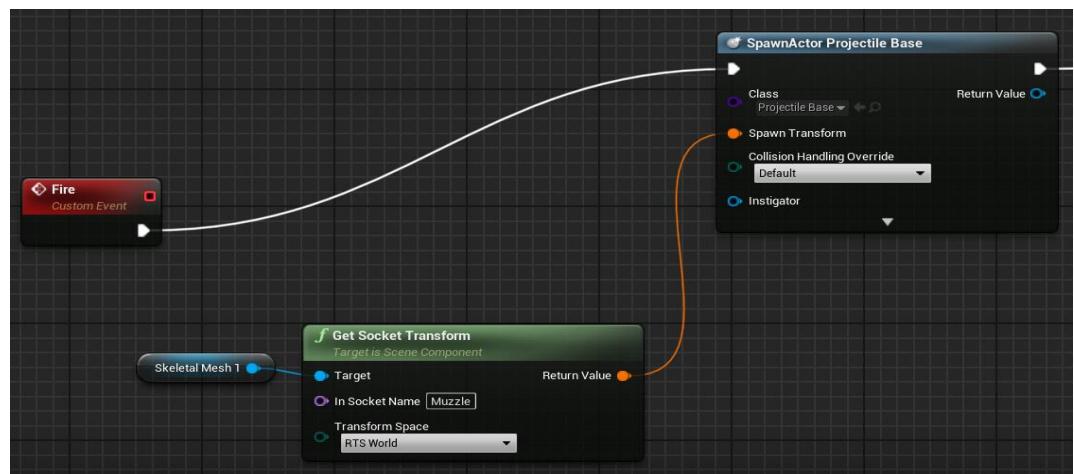
M-16 Weapon Blueprint

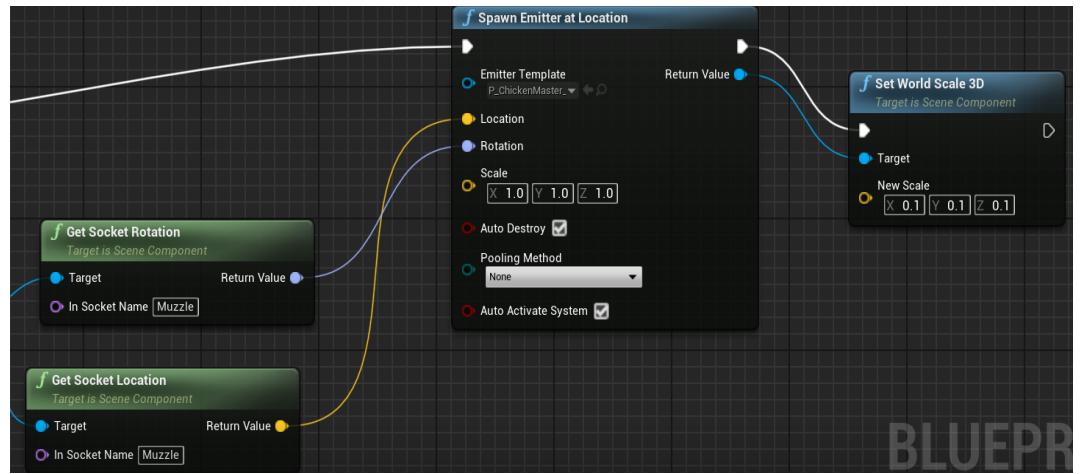
Reload Function





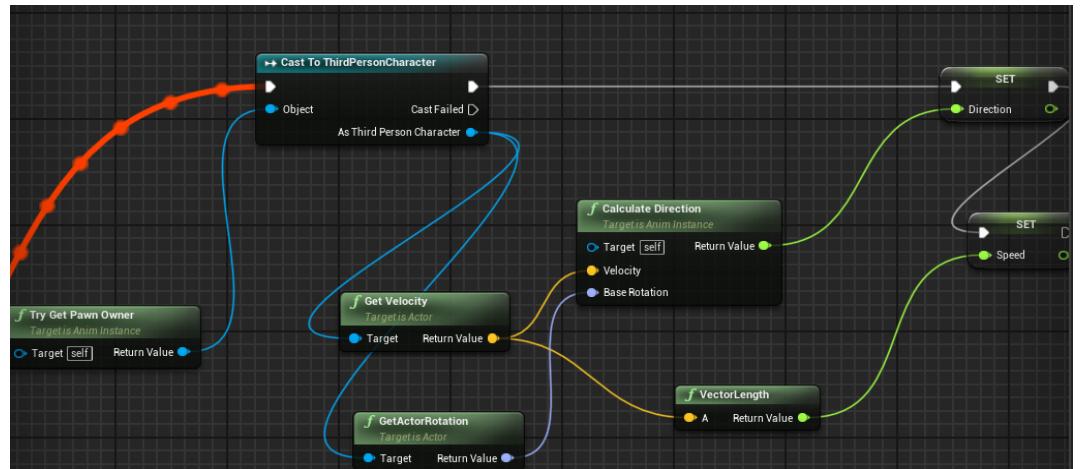
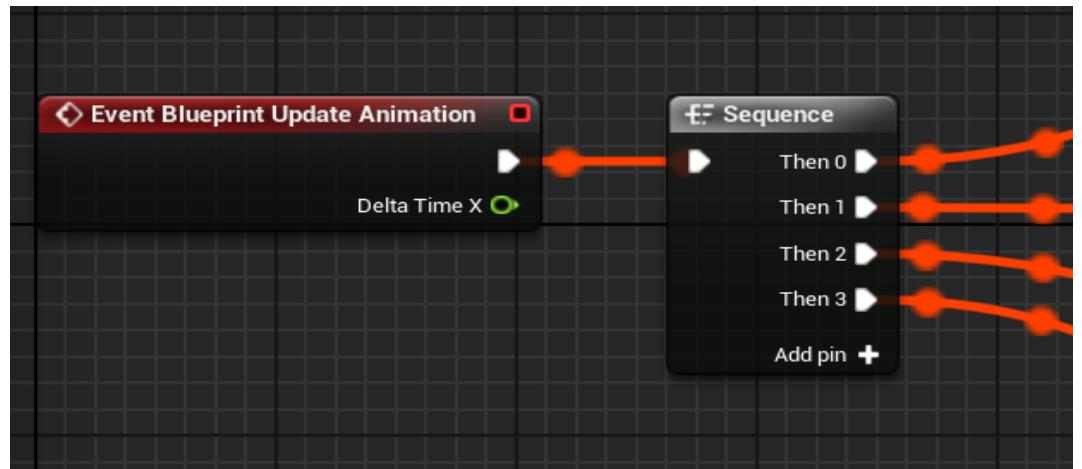
Main event graph

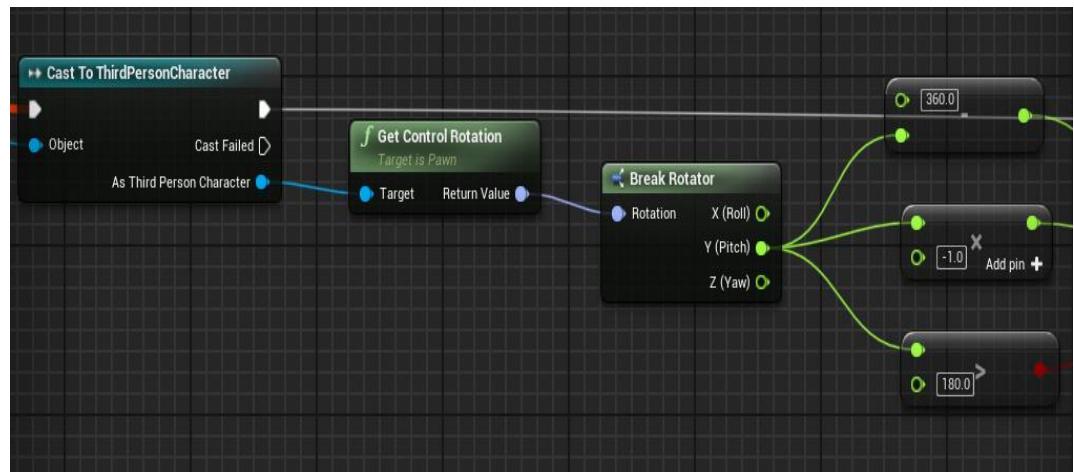
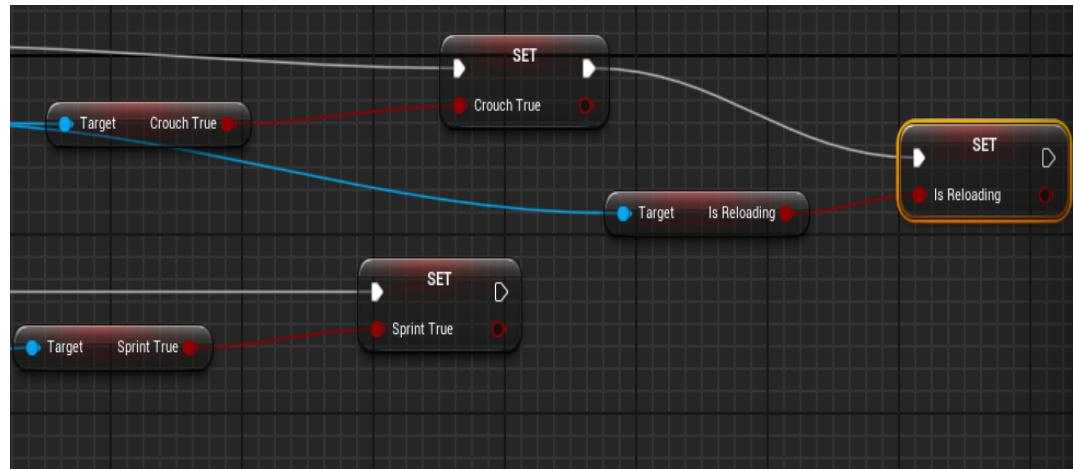
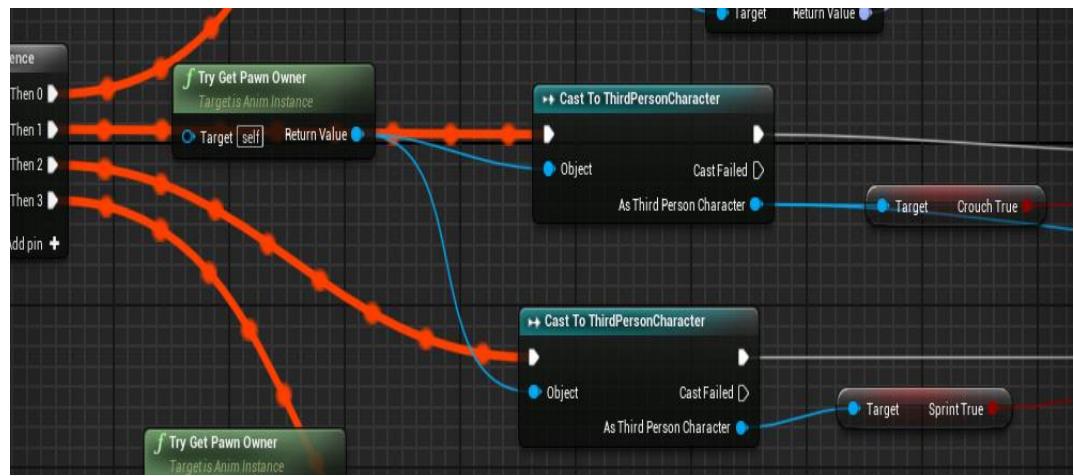


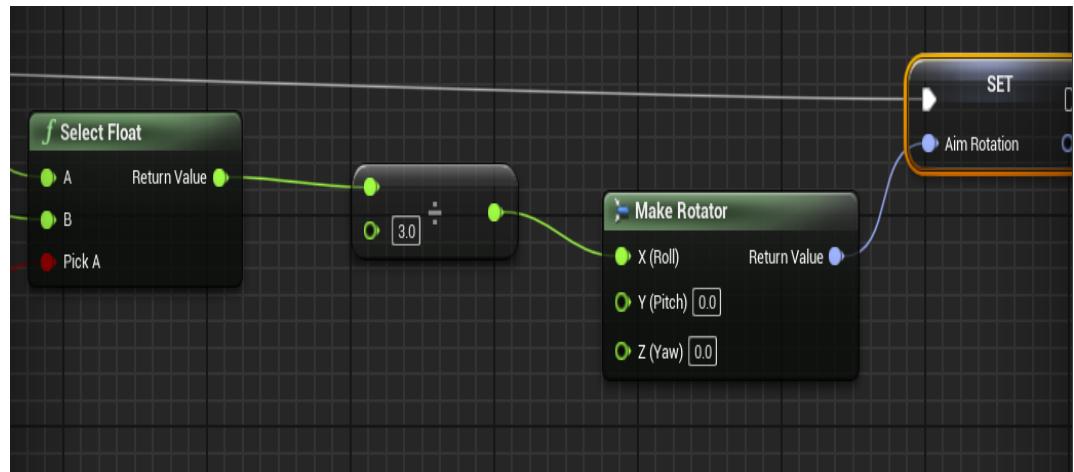


Player Animation Blueprint

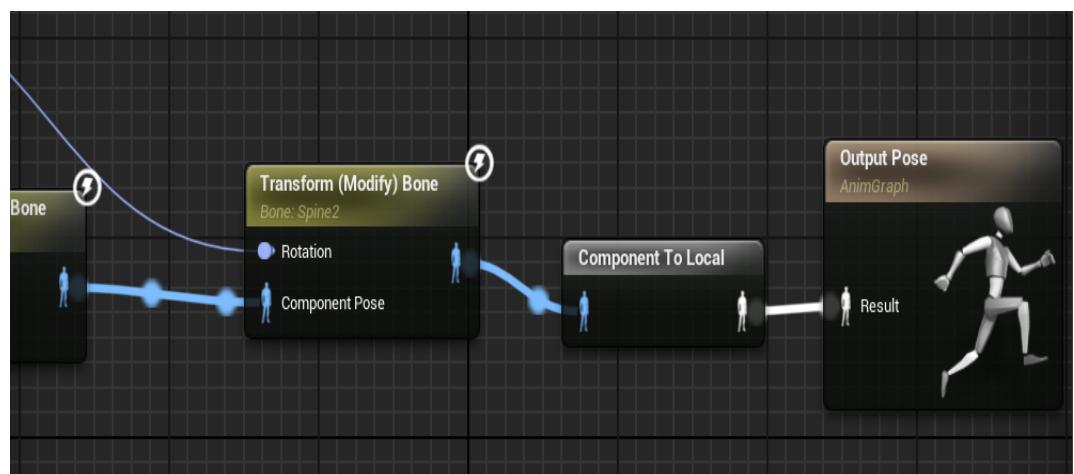
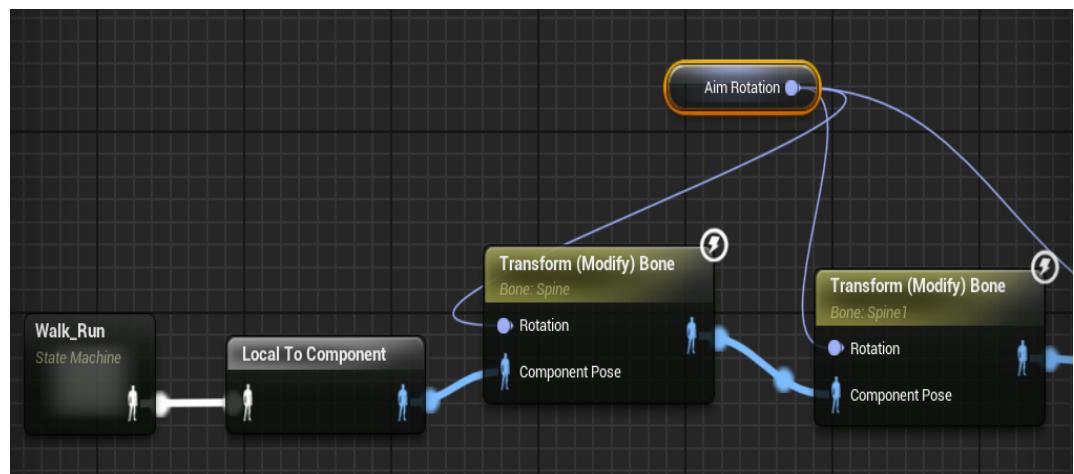
Event Graph



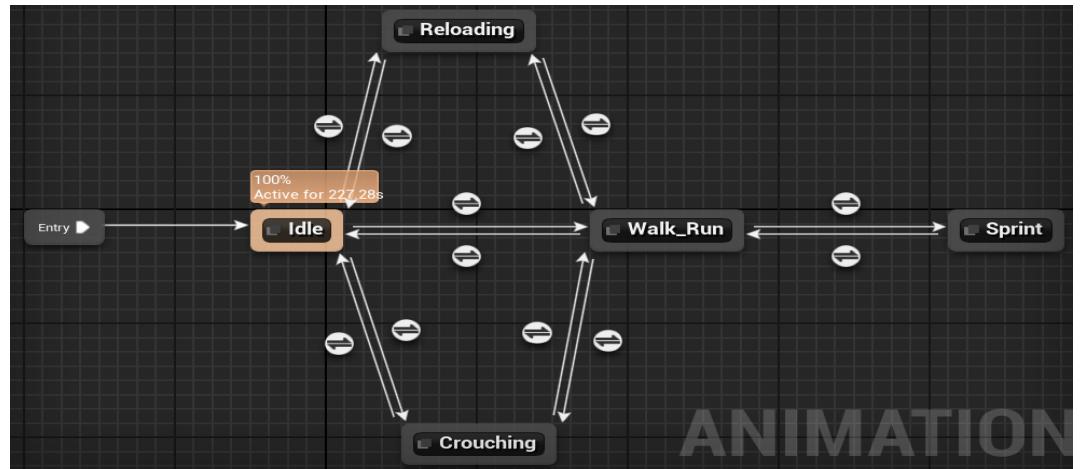




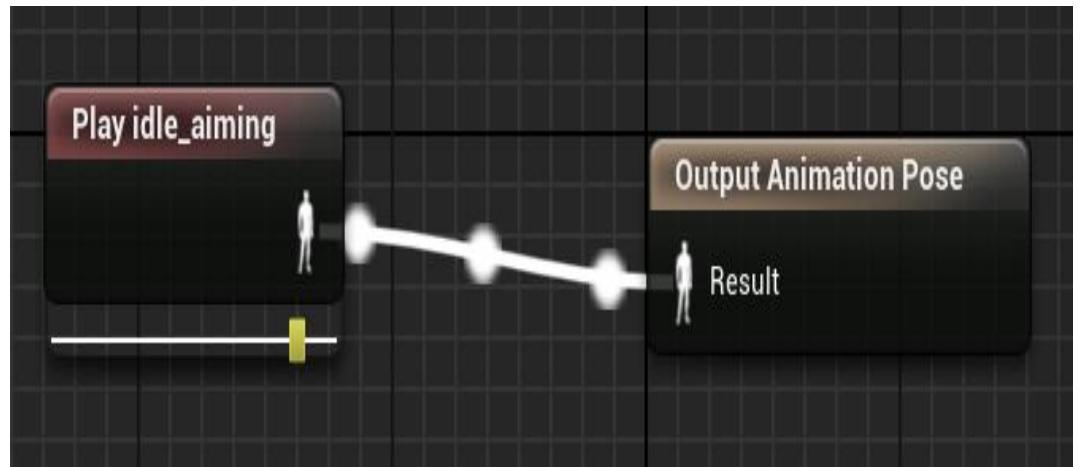
Player Animation Graph



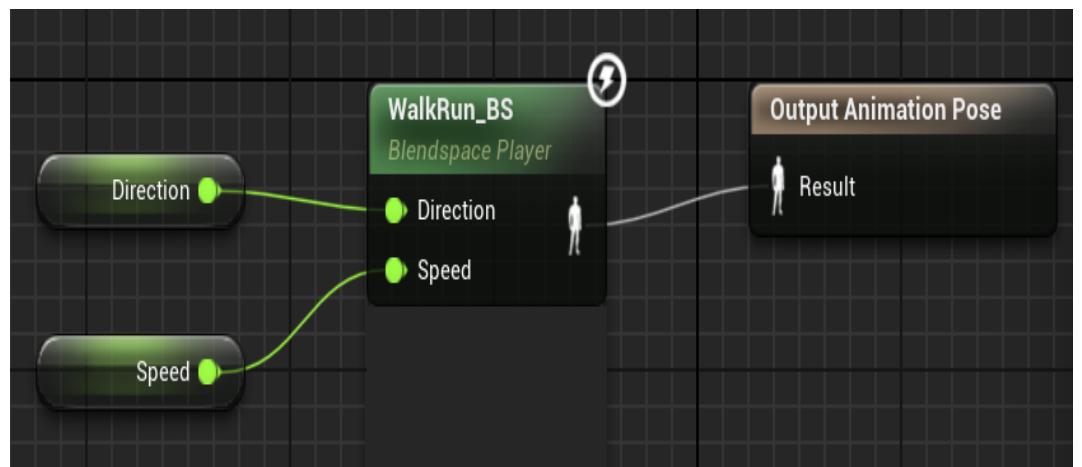
Player Walk Run State



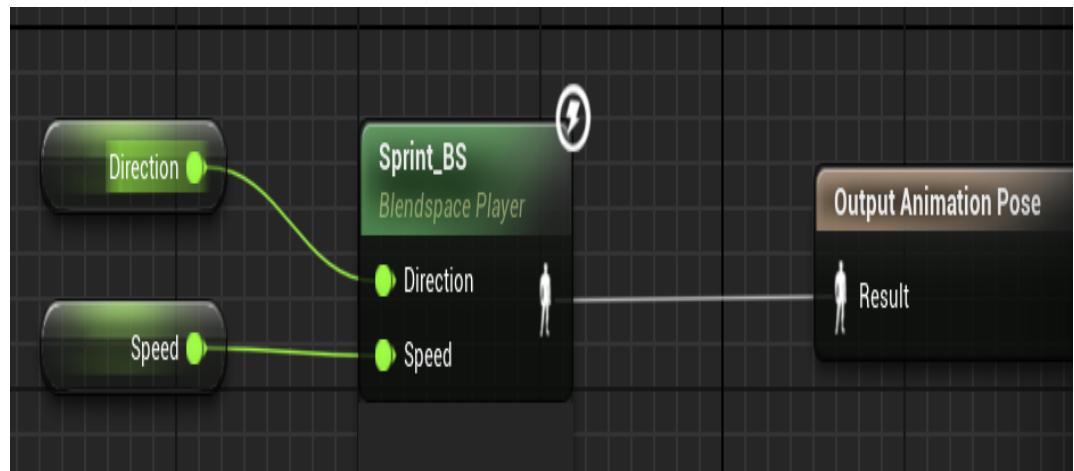
Idle Rule



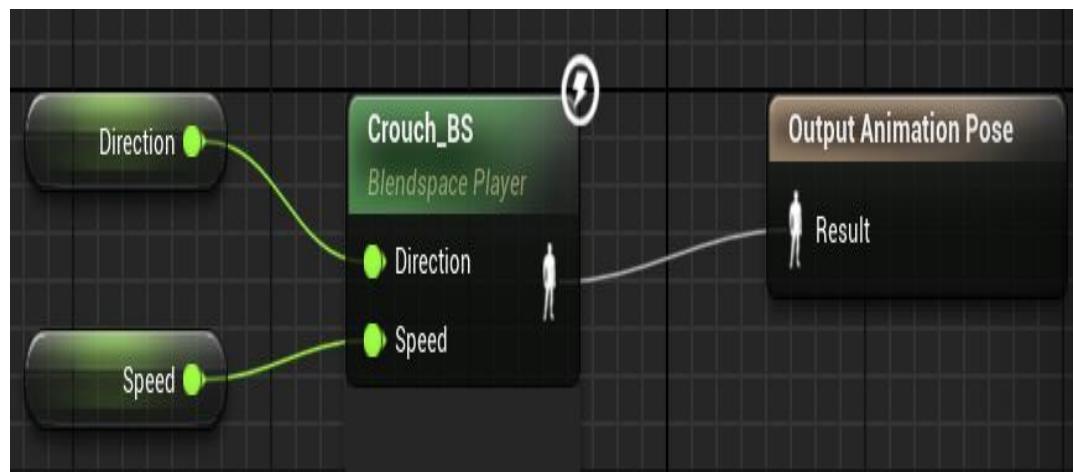
Walk Run Rule



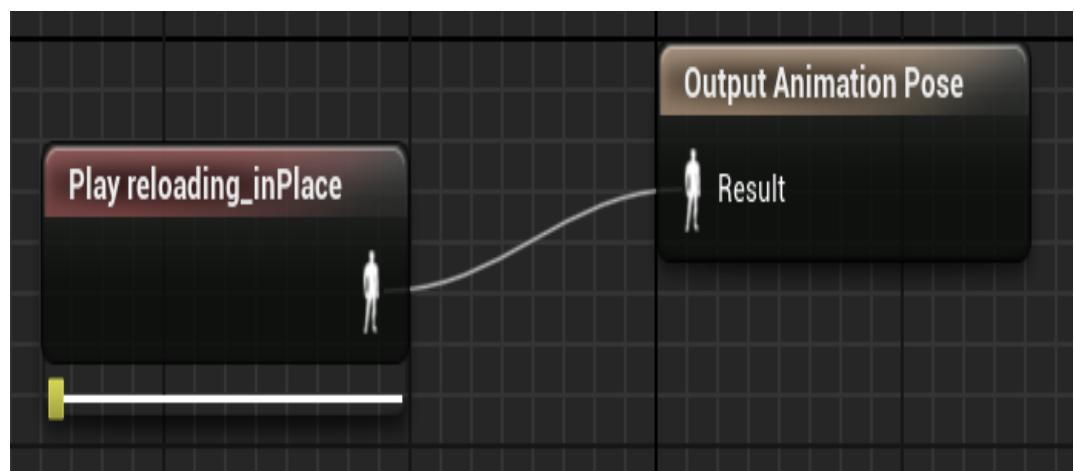
Sprint Rule



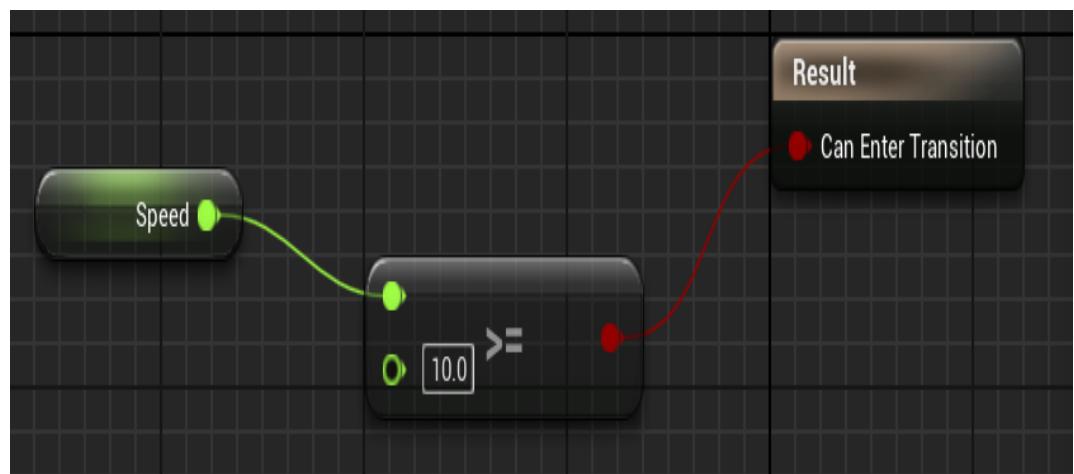
Crouch Rule



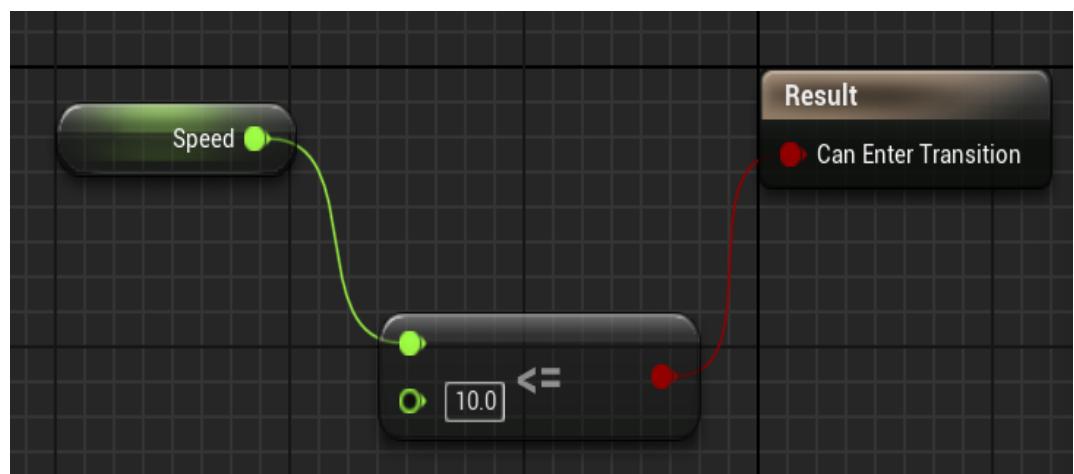
Reload Rule



Idle to Walk-Run Rule



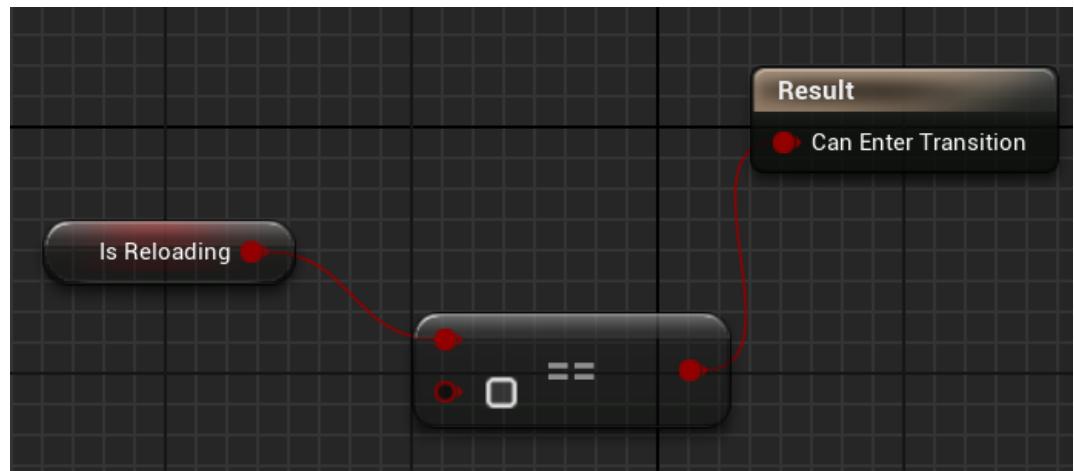
Walk-Run to Idle Rule



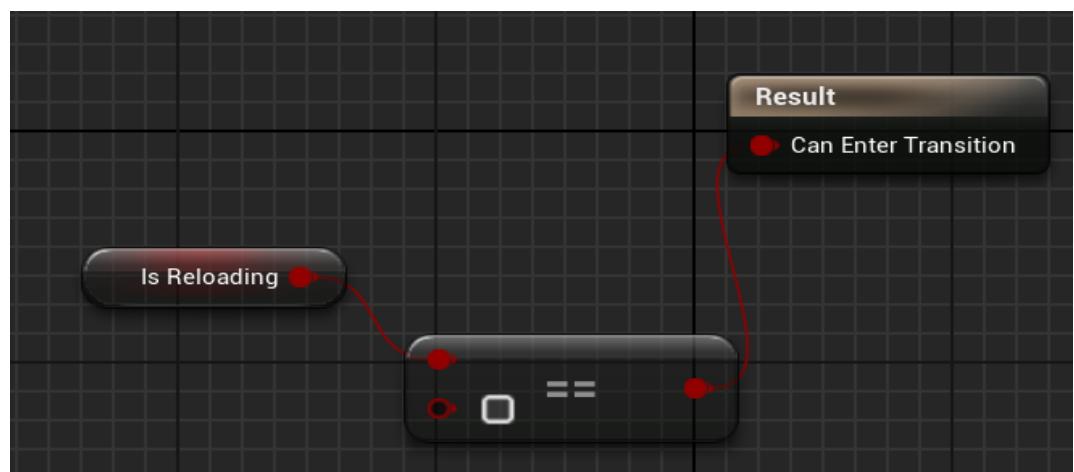
Idle to Reloading Rule



Reloading to Idle Rule



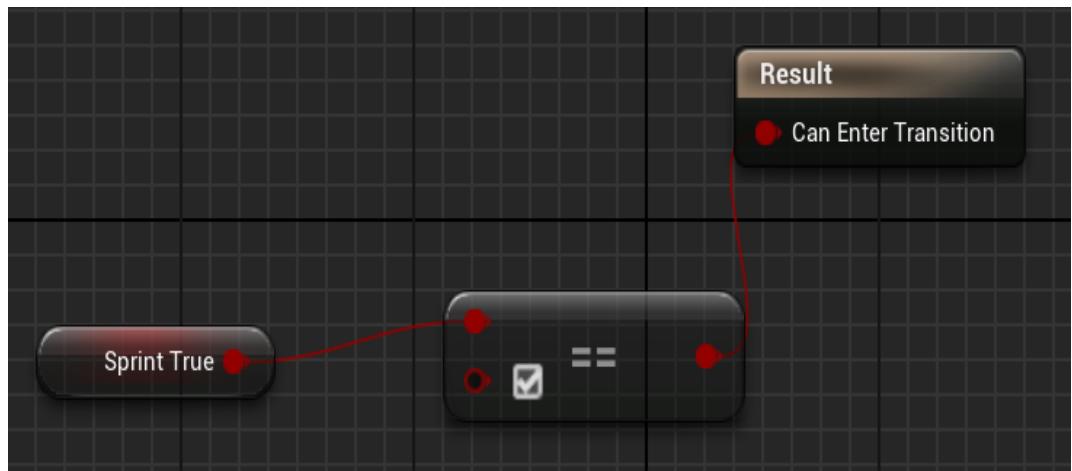
Reloading to Walk-Run Rule



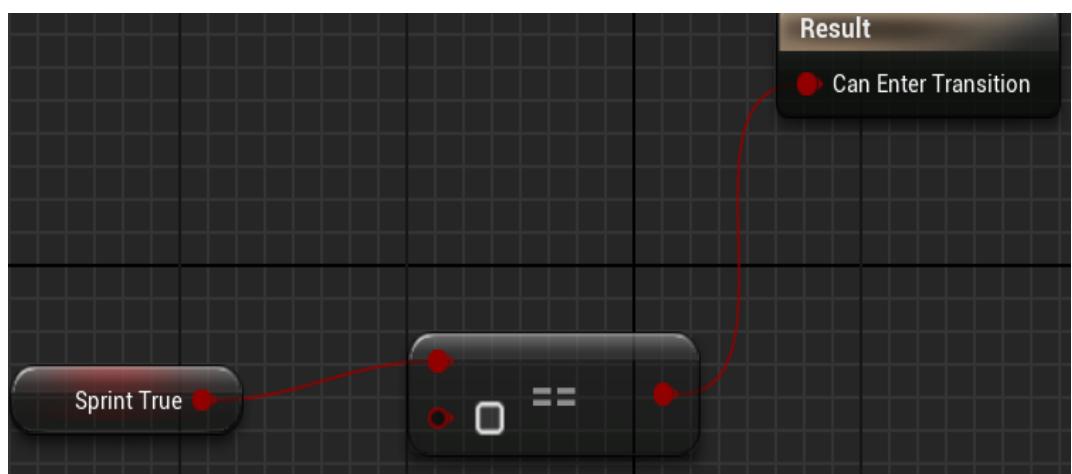
Walk-Run to Reloading Rule



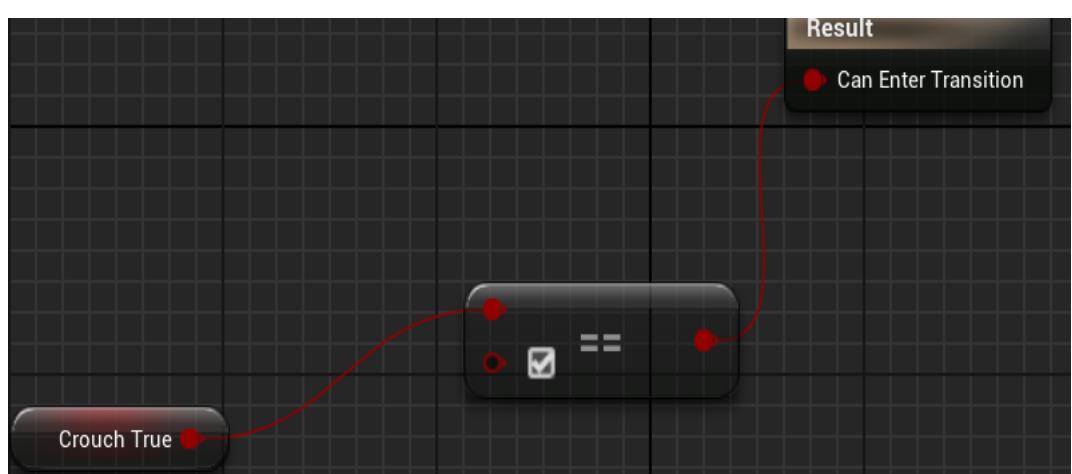
Walk-Run to Sprint Rule



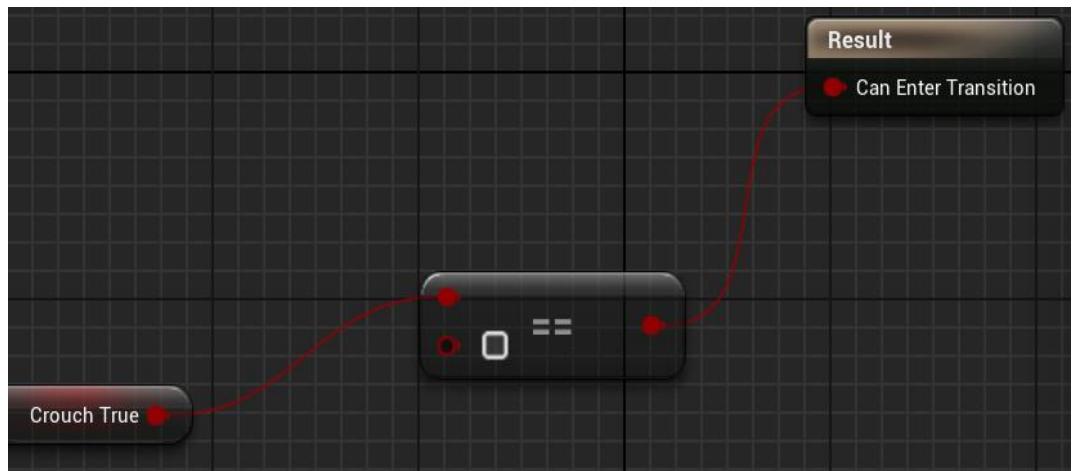
Sprint to Walk-Run Rule



Walk-Run to Crouch Rule



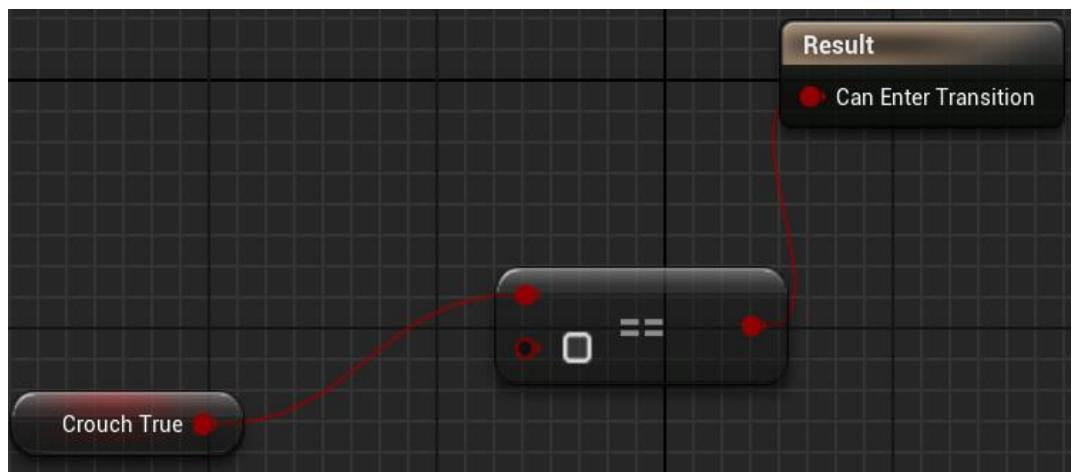
Crouch to Walk-Run Rule



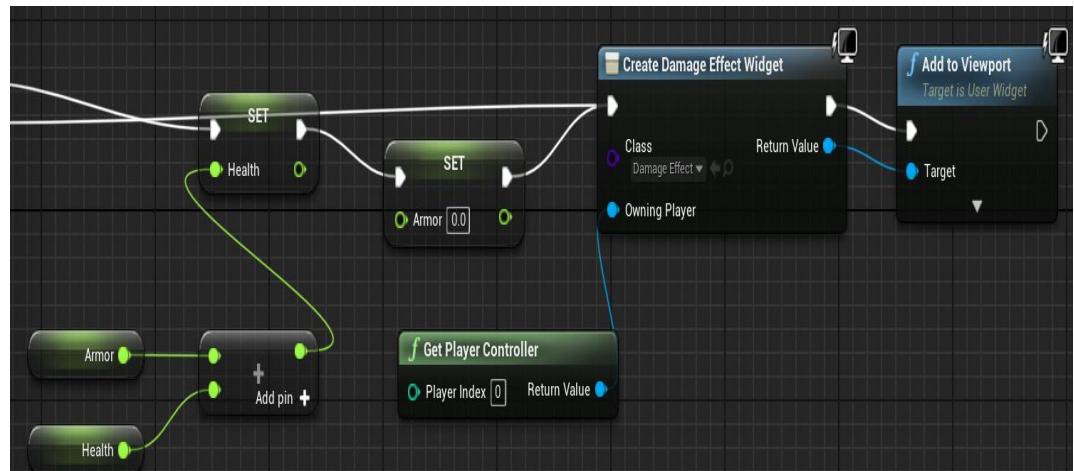
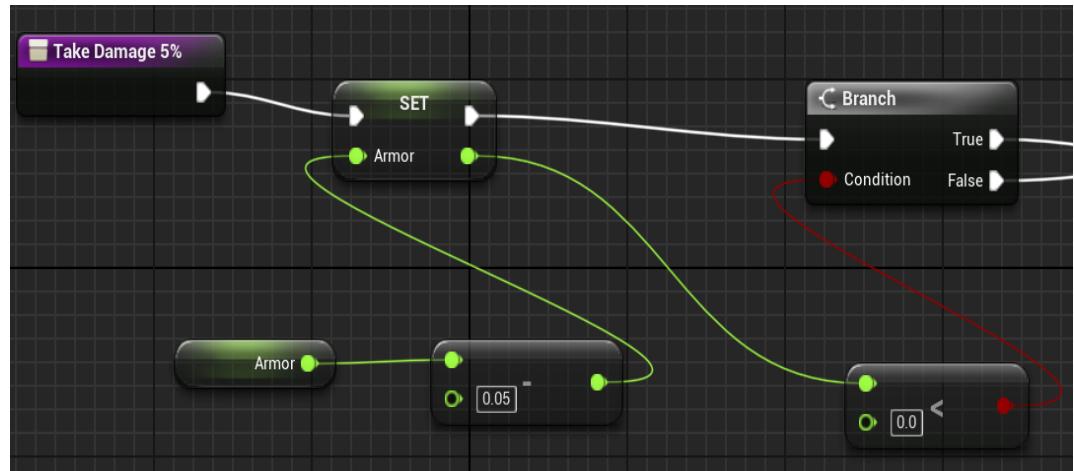
Idle to Crouch Rule



Crouch to Idle Rule

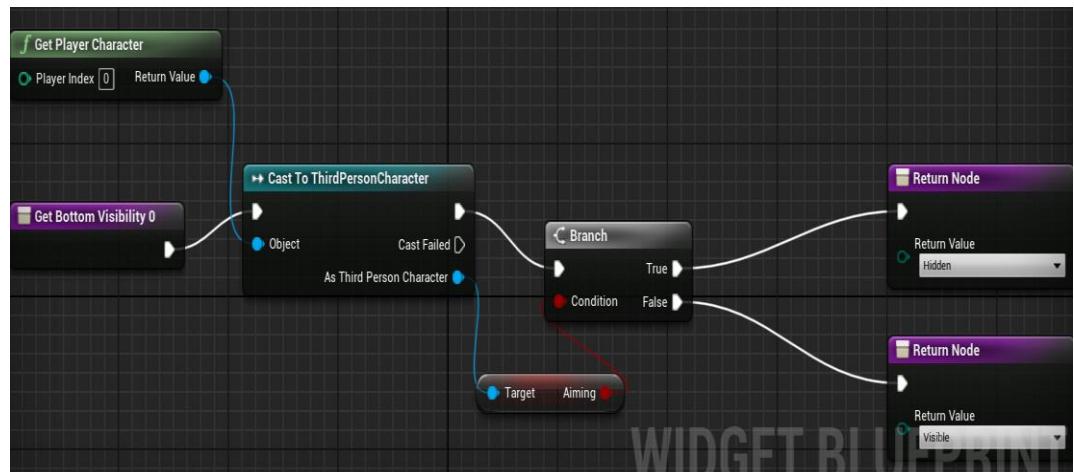


Damage Function according to percentage 5%,10%,20%

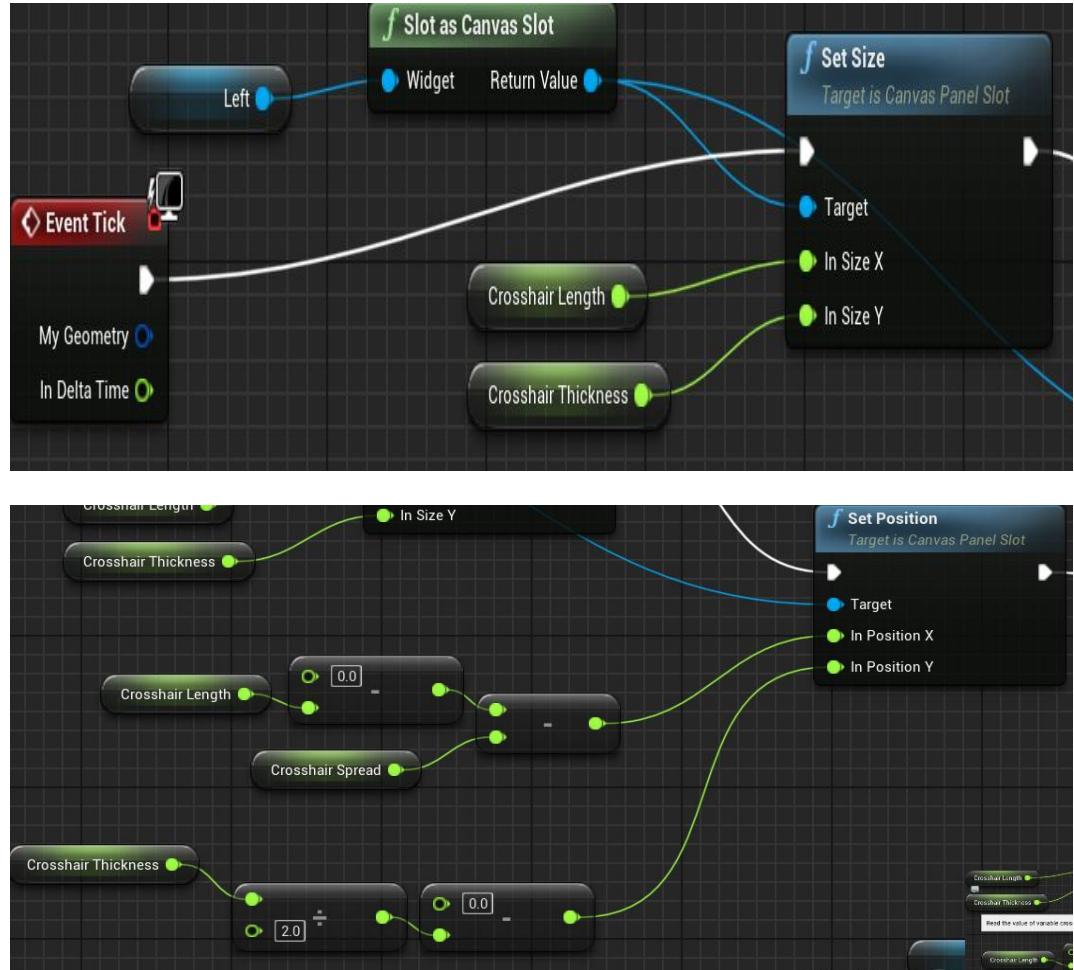


Dynamic Crosshair Blueprint

Same blueprint for Top, Bottom, Right and Left function of crosshair



Event Graph of Dynamic Cross Hair



5.3 Testing Approach

Testing is a method to check whether the actual software product matches expected requirements and to ensure that software product is defect free. It involves execution of software/system components using manual or automated tools to evaluate one or more properties of interest. Unit testing is a type of testing where individual units or components of a software are tested. Unit testing is a White Box testing technique that is usually performed by the developer. To test individual modules of this app, unit testing and functionality testing were done. In the end, integration testing was done to check the functionality of all the components.

5.4. Test Cases

5.4.1 Home Screen

Test Case ID	Test Case Description	Test Steps	Expected Result	Actual Result	Status
1	New Game Button	Click on the New Game Button	Entering and beginning of a new game	Entering and beginning of a new game	Pass
2	Settings Button	Click on the Settings Button.	It should show various settings options such as “Volume”, “Graphics” and “Resolution”.	It should show various settings options such as “Volume”, “Graphics” and “Resolution”.	Pass
3	Quit	Click on the Quit Button	Game will close	Game will close	Pass

5.4.2 In-game Settings

Test Case ID	Test Case Description	Test Steps	Expected Result	Actual Result	Status
1	Pause Menu	Click on Pause menu.	It should pause the Game and show options like Quit the Game and Resume the Game.	It should pause the Game and show options like Quit the Game and Resume the Game.	Pass

2	Shoot Button	Click on the LMB	It should make the gun fire bullets.	It should make the gun fire bullets.	Pass
3	Scope Button	Click or hold the RMB	The scope is opened.	The scope is opened.	Pass
4	Change Weapon	Click on the numpad for desired weapon	Weapons are switched.	Weapons are switched.	Pass
5	Ctrl(Crouch Button)	Press the Ctrl key	The player should crouch	The player should crouch	Pass
6	W(Moves Ahead)	Press the W key	The player should move forward	The player moves forward	Pass
7	A(Moves to the Left)	Press the A key	The player should move towards left.	The player moves towards left.	Pass
8	D(Moves to the Right)	Press the D key	The player should move towards right	The player moves towards right	Pass
9	S(Moves Backwards).	Press the S key	The Player should move backwards.	The Player moves backwards.	Pass
10	R(Reload)	Press the R key	The player will reload the gun	Gun is reloaded	Pass
11	G	Press the G key	The Player will throw the Grenade	Grenade is thrown	Pass

12	F	Press the F key	The Player will throw the Smoke Grenade	Smoke Grenade is thrown	Pass
13	Shift	Press the Shift Key	The Player will sprint	The Player will sprint	Pass
14	Space	Press the Space Bar	The Player will jump	The Player will jump	Pass

5.4.3 Endgame Screen

Test Case ID	Test Case Description	Test Steps	Expected Result	Actual Result	Status
1	Exit Game	1) Click on Exit Game. 2) Player will be on Home Screen.	Player will end up on Home Screen.	Player will end up on Home Screen.	Pass
2	Play Again	Click on Play Again.	The Game Will Restart.	The Game Will Restart.	Pass

Chapter 6: Results and Discussions

6.1 Test Report

After all the modules of the project has been tested, a test report is generated which contains the summary of all the test cases. The test report typically includes information about the testing environment, the test cases executed, the test results, and any defects found during testing.

Manual testing was done in this project to check the functionality of the game. Since the game requires user input it is necessary to manually check all the modules. Upon testing some bugs were found which were later. After fixing all the bugs and errors, a final test was done and after successful testing .exe file was created

6.2 User Documentation

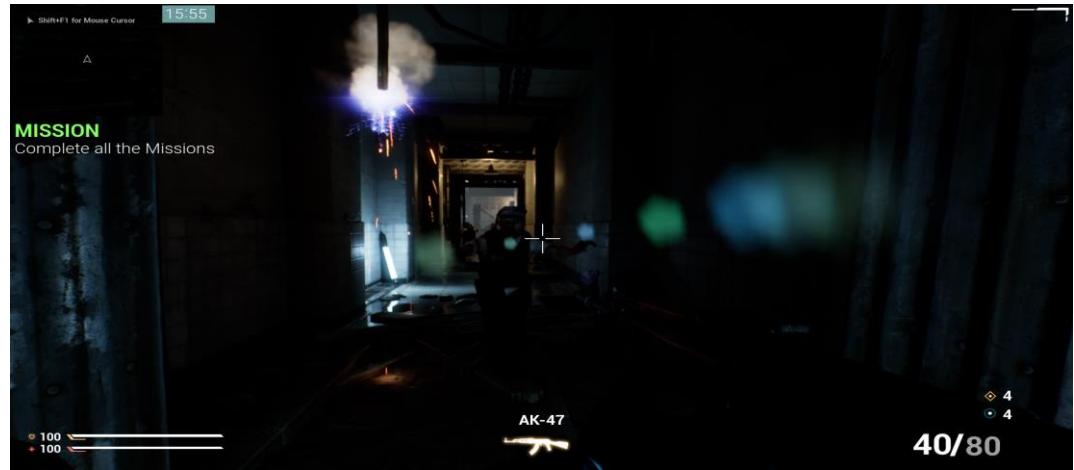


Figure 1: Basic UI of the game

When user clicks start game, the basic layout and user interface of the game can be observed and understood by the user.

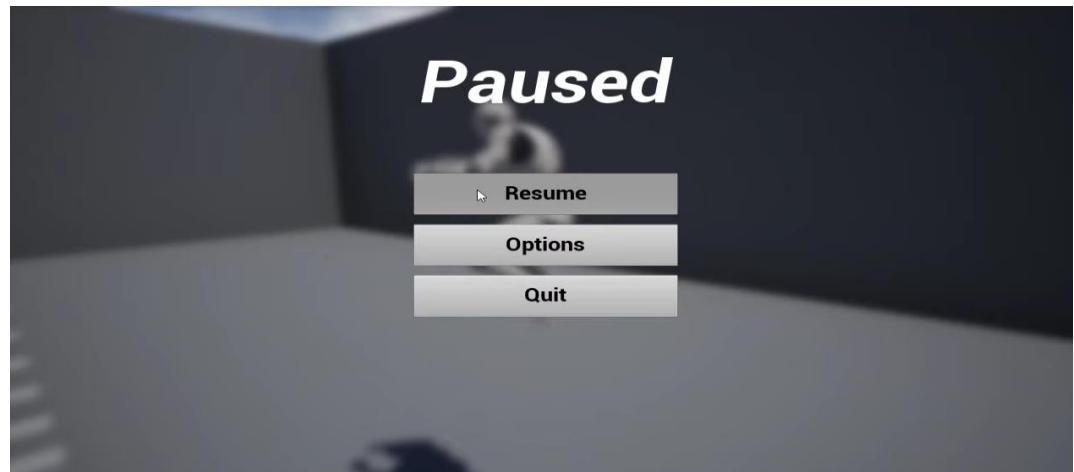


Figure 2: Pause menu

The player can pause the game using the “Esc” key. The pause menu has the options to Resume the game, Enter into the settings and Quit the game.

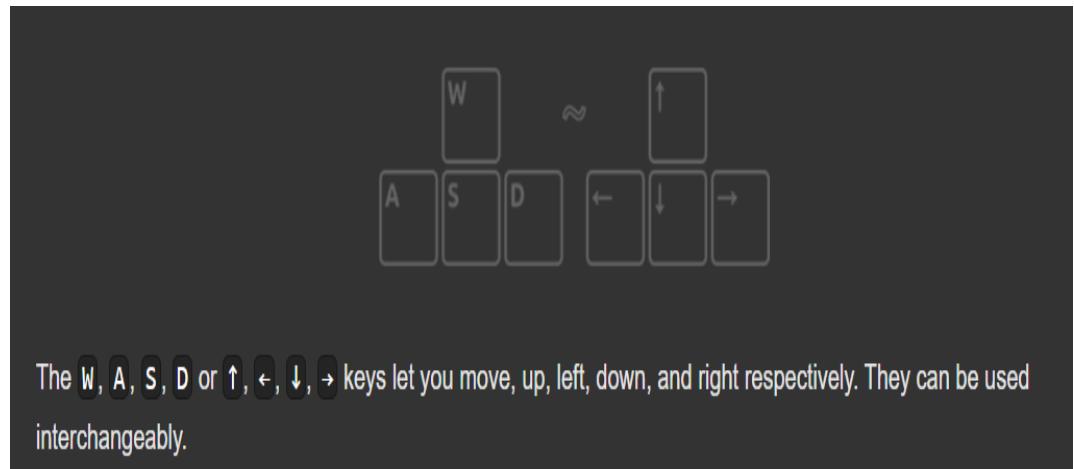


Figure 3: The basics related to motion and general mechanics of the game

The player can explore the basic movements in the game using W(character will move forward), A(to the left), D(to the right) and S(Backward) using the given keys. Also the gamer can scout the surrounding environment by just moving the mouse in the desired direction.

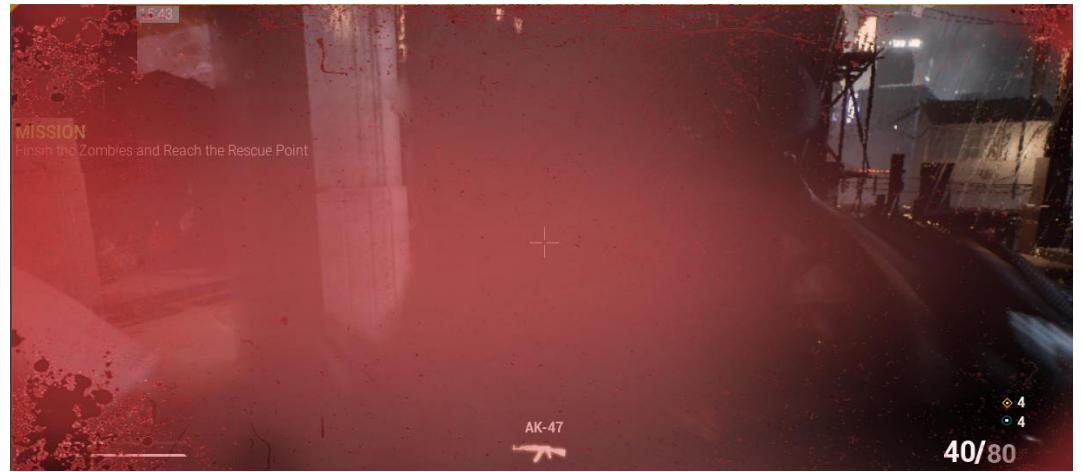


Figure 4: Zombies attacking the player

Once the game begins the player is attacked by multiple zombie bots coded to follow and attack the player hence reducing the health points(HP) of the player.



Figure 5: Player can use various weapons

The player can use multiple guns and weapons to attack the zombies. For firing the player needs to click the LMB(left mouse button) while for ease in aiming and a clear sight the RMB(right mouse button) can be used. Player can also switch between the weapons and throw Grenades towards the enemy.



Figure 6: Player firing at the enemies

As the game proceeds further the player can use guns to fire at the zombie bots, damage them and kill them.



Figure 7: Player Reloading

If the player gets out of ammo he has to reload in-order to proceed further in the game.



Figure 8: The Minimap

The Game is provided with the minimap of the map. It will be used by the player to guide through out the map to reach any specific location.

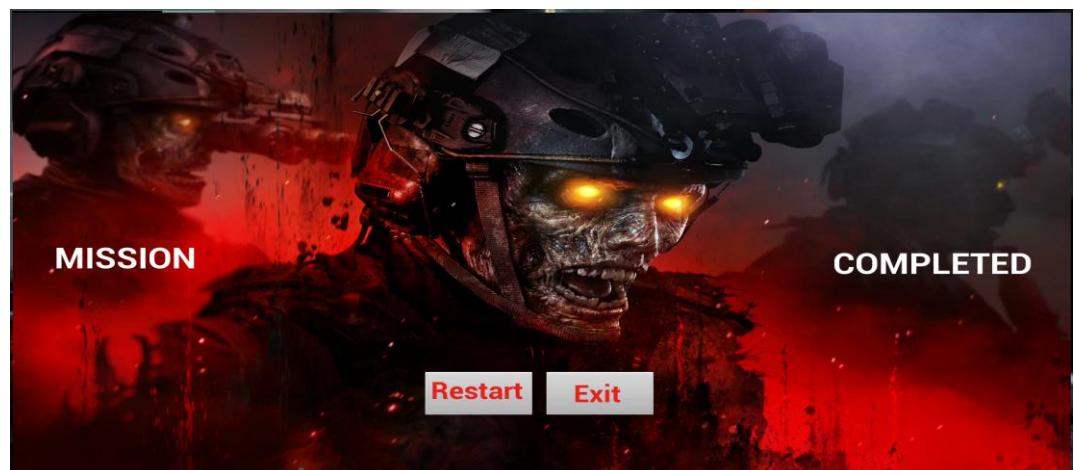


Figure 9: Reach the Safe Zone

A particular area in the game is marked as safe zone. Once the gamer reaches the safe zone the game is completed and an option to either restart the game or quit the game is shown.



Figure 10: Game over message

Chapter 7: Conclusion

7.1 Significance of the system

Apex Assault is a 3D game situated in a post apocalyptic world. In this game the player has to survive the attack from the zombies and protect himself and reach the desired safe zone. Players can install this game and play it for enjoyment and refreshment. The game has good graphics and can be installed on low end devices too as it is lite in size and consumes less resources. Due to its lite nature it can be highly accessible and played by many gamers.

7.2 Limitations of the system

There are certain limitations to this game. The game is only limited till Windows operating system. With a few changes and upgrades the game can be ported to other operating systems and devices powered by Linux, Android and IOS. Also the resources and the interactions in the game are limited to keep its size low. Though the game is properly optimized for low end devices, some systems would crash the system if the hardware is too weak or if it doesn't meet the specific requirements of the game.

7.3 Future scope of the project

Games are the reflection of the imaginative world of its creators on the computer screen. The future scope to this game are endless. Anything one can imagine could be added to the game. Currently the game is restricted to a certain area of land on the map. With time the map and its resources can be expanded. It would be done as per the theme of the game and the imagination of its creators respectively. With time the PCs around are getting more powerful and efficient. This means more powerful devices are reaching a vast user base. Hence more changes could be made on a graphical level with the introduction of new skins and textures to the various elements in the entire map.

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