Task 1 - Evaluation

Error 1

During the development of my Pong clone I encountered five major errors. The first was during my attempt at setting up both paddles to be moved simultaneously to code and test collision detection. Since both paddles were going to be moved together with the controls, I copied and pasted the player paddle code into the AI paddle script file. I kept receiving an error due to not realizing I had to change the class from Player to AI.

Error 2

The second major error was the collision detection was initiating sooner than desired and therefore looked like there was an invisible barrier in the field. The cause of this turned out to be that the topBounds and bottomBounds values where set 4 points more or less from the required values. To solve this issue, I placed the ball prefab into the game and moved it towards the desired positions and marked down the proper position values that were shown in the inspector.

Error 3

While setting up the scoring system, both paddles were disappearing visually when initializing the game. However, they were still there physically and the ball did bounce off of them, they were just invisible. This was happening because the Sprite Renderer in the inspector had the order in layer set to a value of 0. Amending the value to 2 solved my issue.

Error 4

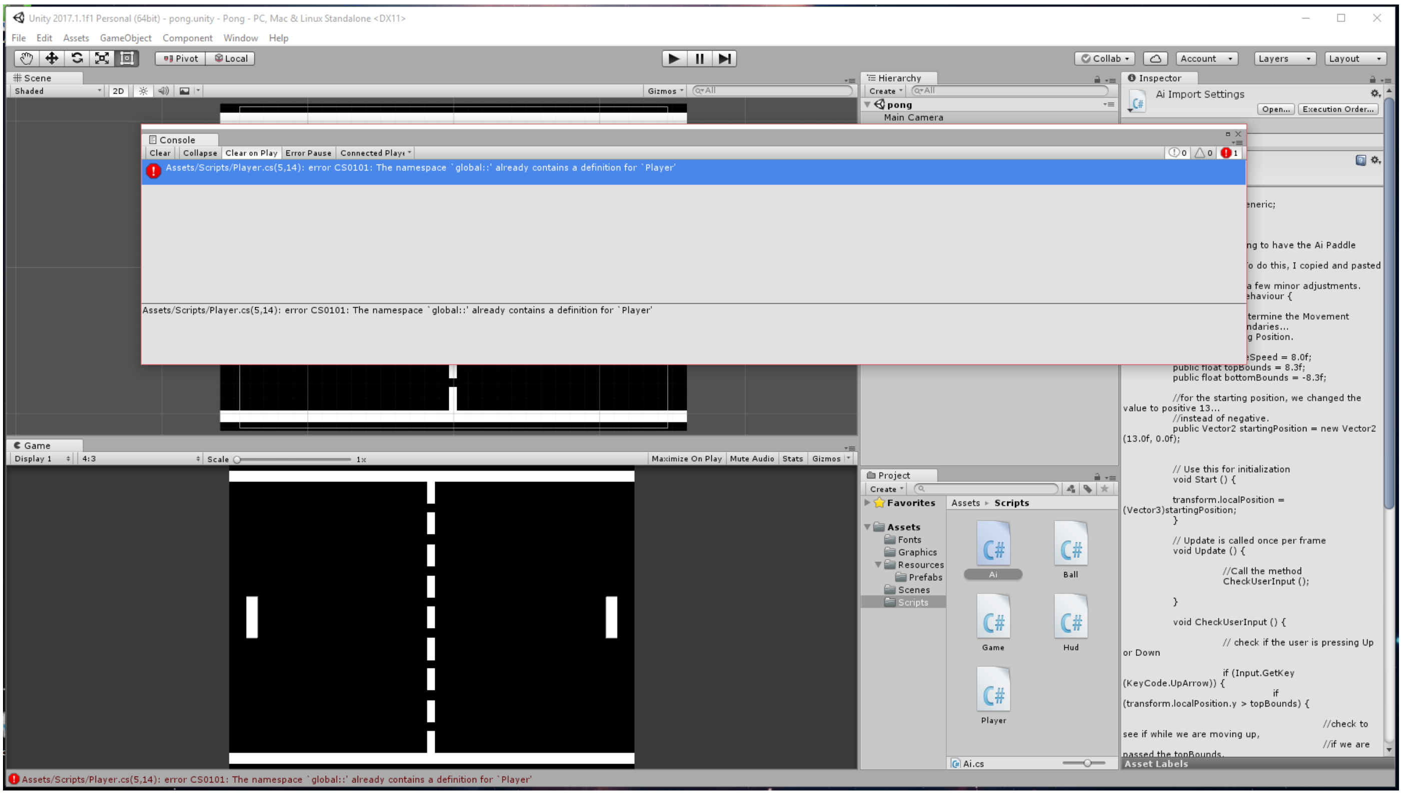
Whenever the ball passed the player or ai paddles, the score immediately rises up to 9. The reason for this was because the collision detection calculated from the centre of the paddle to its edge (right edge for player paddle and left edge for ai paddle) and the ball took exactly 9 frames to travel from the centre to the edge. The computer then thinks the ball is passing 9 times. The solution to this was calling the function once and stopping it.

Error 5

My final major error occurred while testing gamestate functionality, such as starting and restarting the game using the spacebar. The trouble was that the ball was not respawning and I kept receiving a nullreference exception error. This was happening due to using a specific for different types of gamestates, but forgetting to remove “game” from the code since it wasn’t required. Removing the word “game” from the code solved my issue.

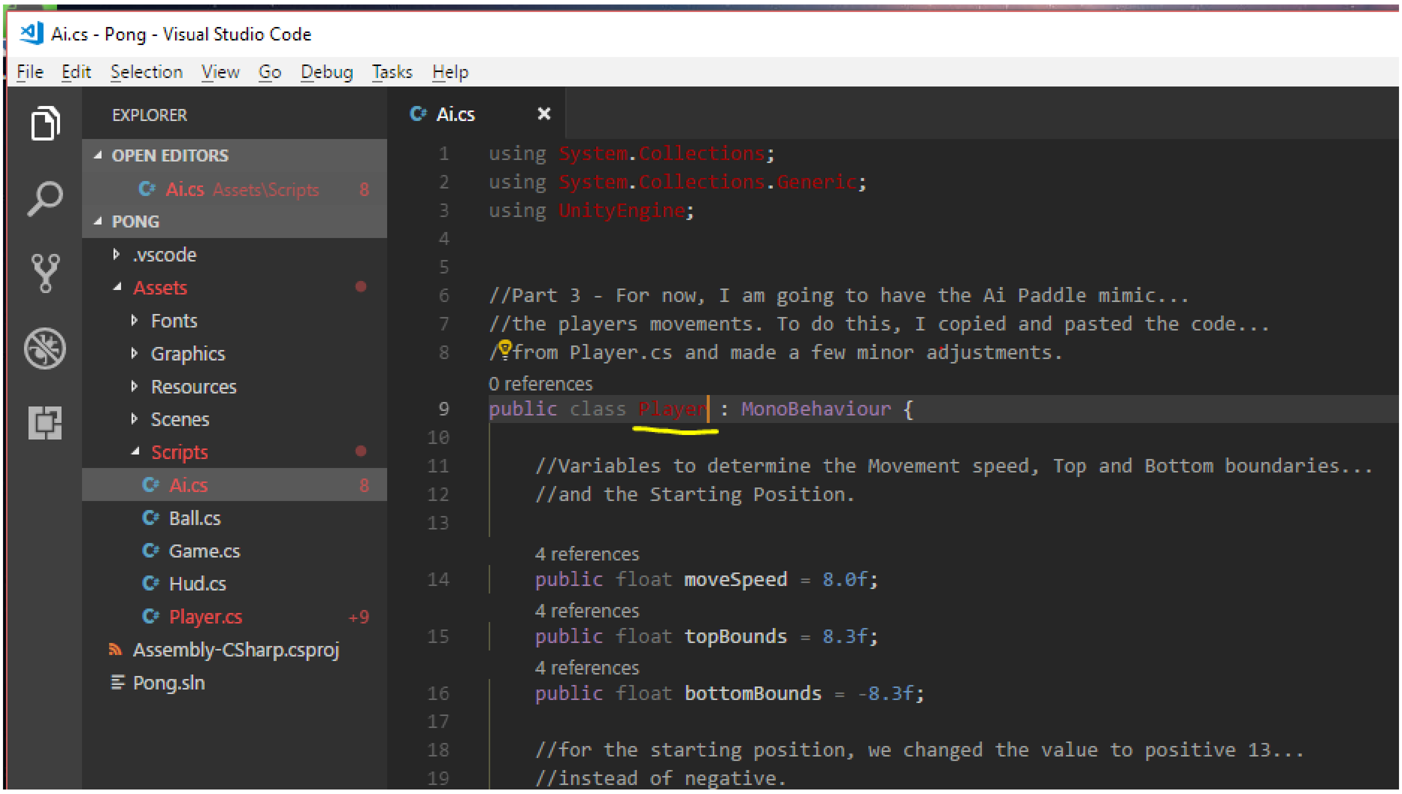
The following are screenshots of the five major errors and what I did to fix them.

Error 1 - Screenshots

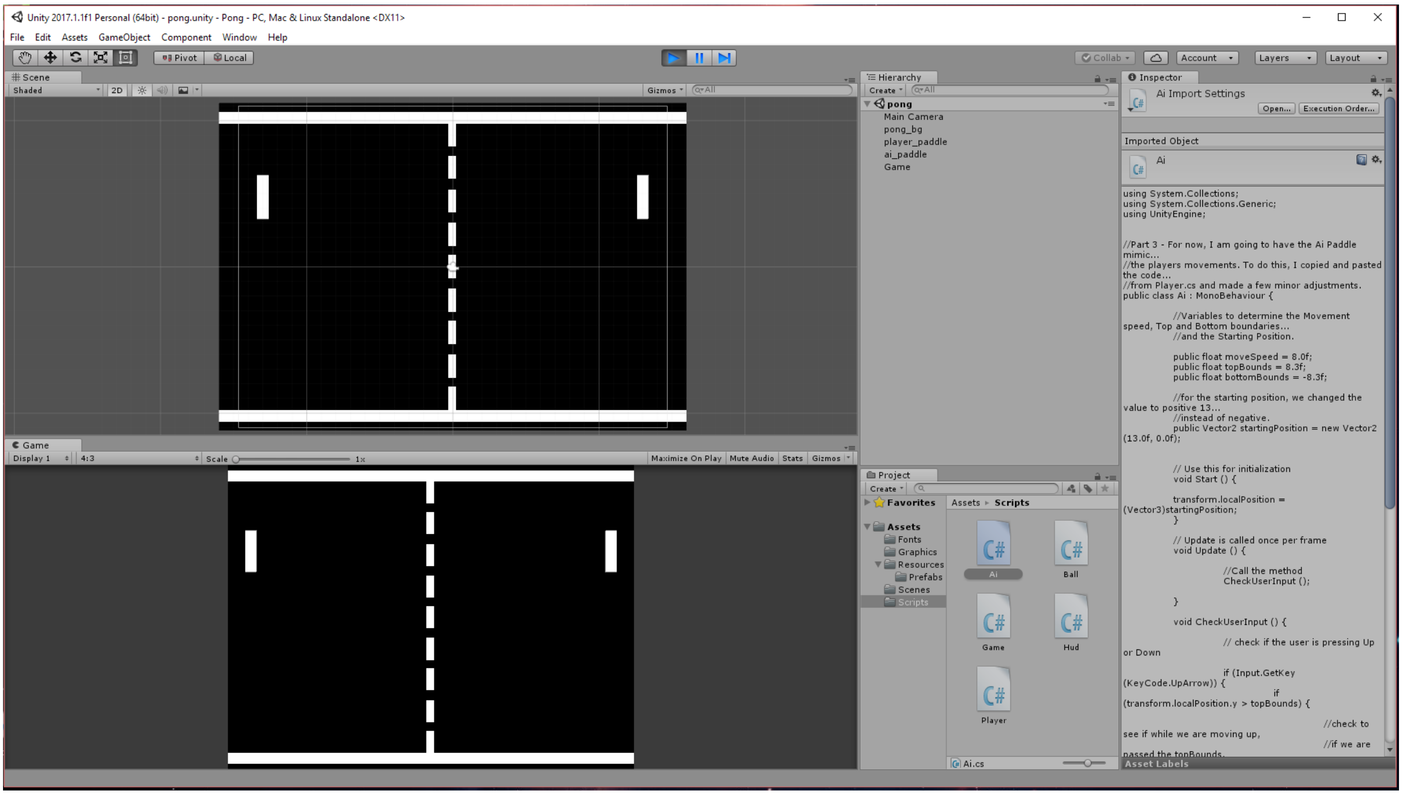


```
Assets/Scripts/Player.cs(5,14): error CS0101: The namespace `global::' already contains a definition for `Player'
```

```
eneric;

ng to have the Ai Paddle
o do this, I copied and pasted
a few minor adjustments.
ehaviour {

termine the Movement
ndaries...
g Position.

eSpeed = 8.0f;
        public float topBounds = 8.3f;
        public float bottomBounds = -8.3f;

        //for the starting position, we changed the
value to positive 13...
        //instead of negative.
        public Vector2 startingPosition = new Vector2
(13.0f, 0.0f);


        // Use this for initialization
        void Start () {

        transform.localPosition =
(Vector3)startingPosition;
        }

        // Update is called once per frame
        void Update () {

                //Call the method
                CheckUserInput ();

        }

        void CheckUserInput () {

                // check if the user is pressing Up
or Down

                if (Input.GetKey
(KeyCode.UpArrow)) {
                        if
(transform.localPosition.y > topBounds) {

                                //check to
see if while we are moving up,
                                //if we are
passed the topBounds.
```

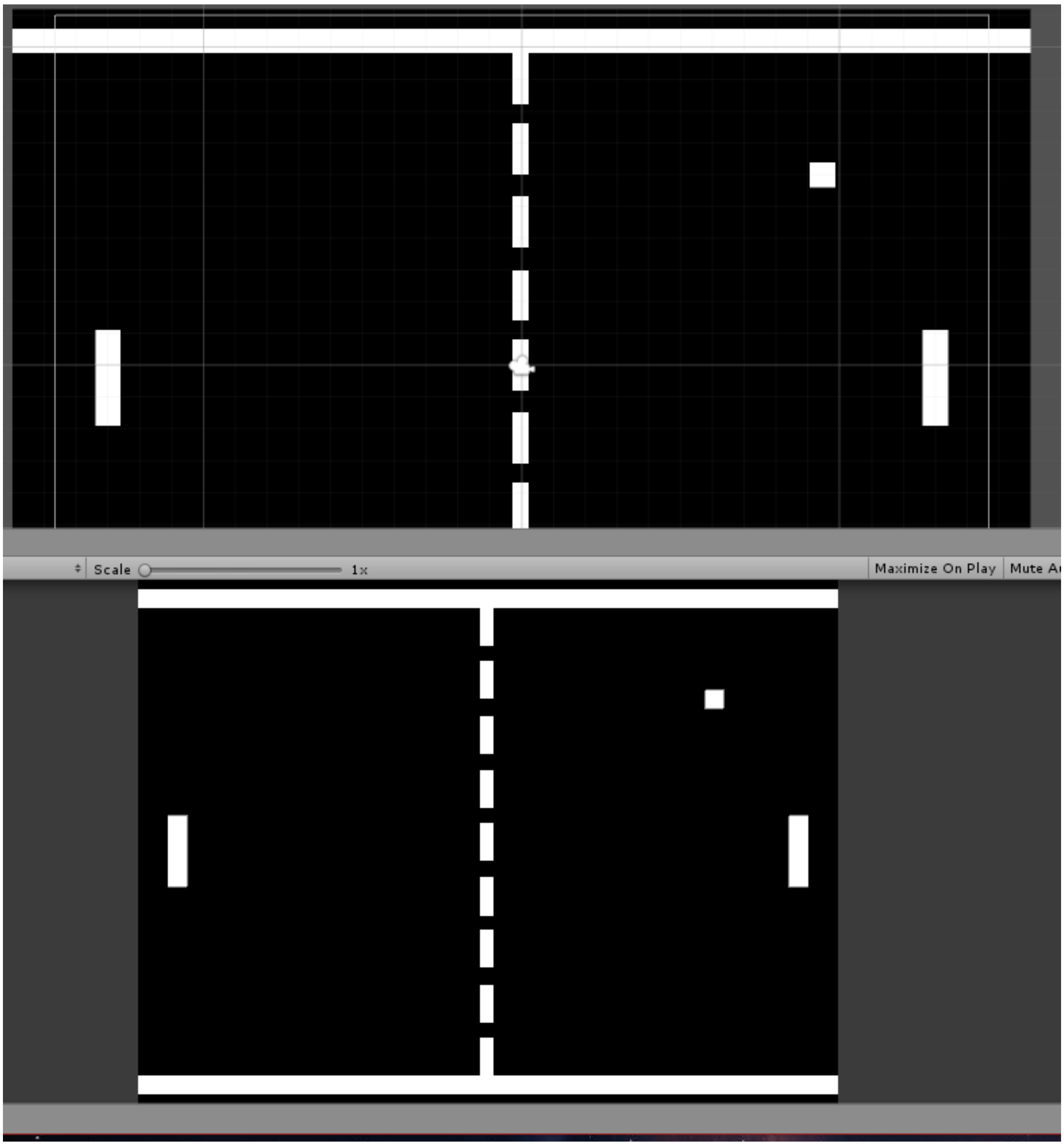


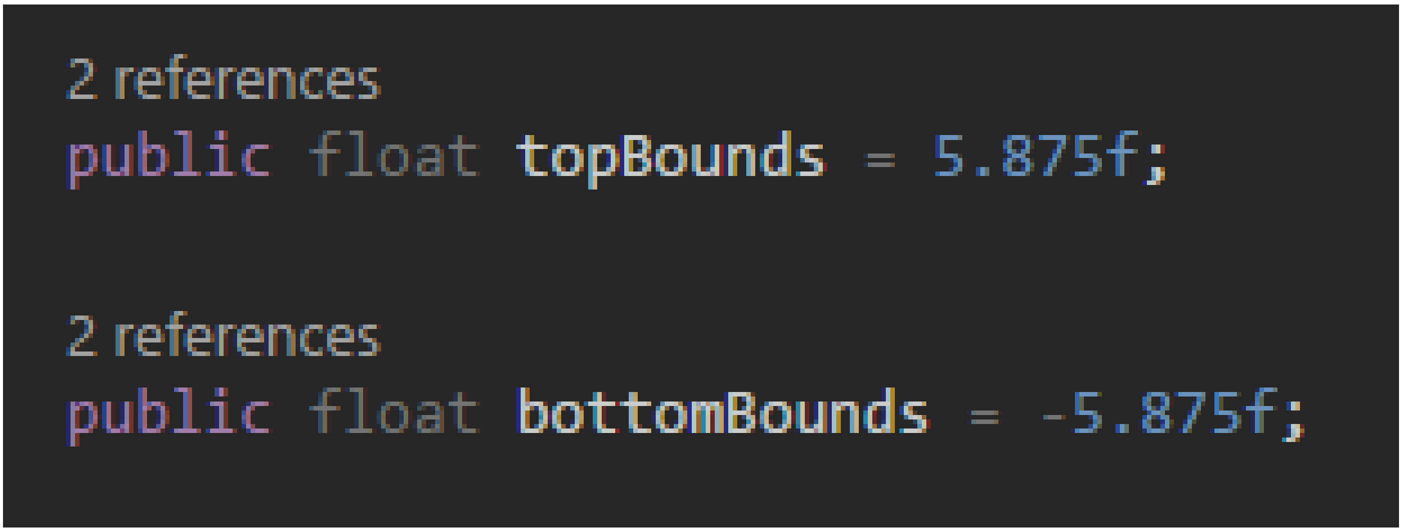
```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;


//Part 3 - For now, I am going to have the Ai Paddle mimic...
//the players movements. To do this, I copied and pasted the code...
//from Player.cs and made a few minor adjustments.
0 references
public class Player : MonoBehaviour {

    //Variables to determine the Movement speed, Top and Bottom boundaries...
    //and the Starting Position.

    4 references
    public float moveSpeed = 8.0f;
    4 references
    public float topBounds = 8.3f;
    4 references
    public float bottomBounds = -8.3f;

    //for the starting position, we changed the value to positive 13...
    //instead of negative.
```


Unity 2017.1.1f1 Personal (64bit) - pong.unity - Pong - PC, Mac & Linux Standalone <DX11>
File Edit Assets GameObject Component Window Help
Pivot Local
Collab Account Layers Layout
Scene Shaded 2D Gizmos All
Hierarchy Create All
pong
Main Camera
pong_bg
player_paddle
ai_paddle
Game
Game Display 1 4:3 Scale 1x Maximize On Play Mute Audio Stats Gizmos
Project Create
Favorites
Assets Fonts Graphics Resources Prefabs Scenes Scripts
Assets ▸ Scripts
Ai Ball Game Hud Player
Ai.cs
Inspector
Ai Import Settings
Open... Execution Order...
Imported Object
Ai
Asset Labels

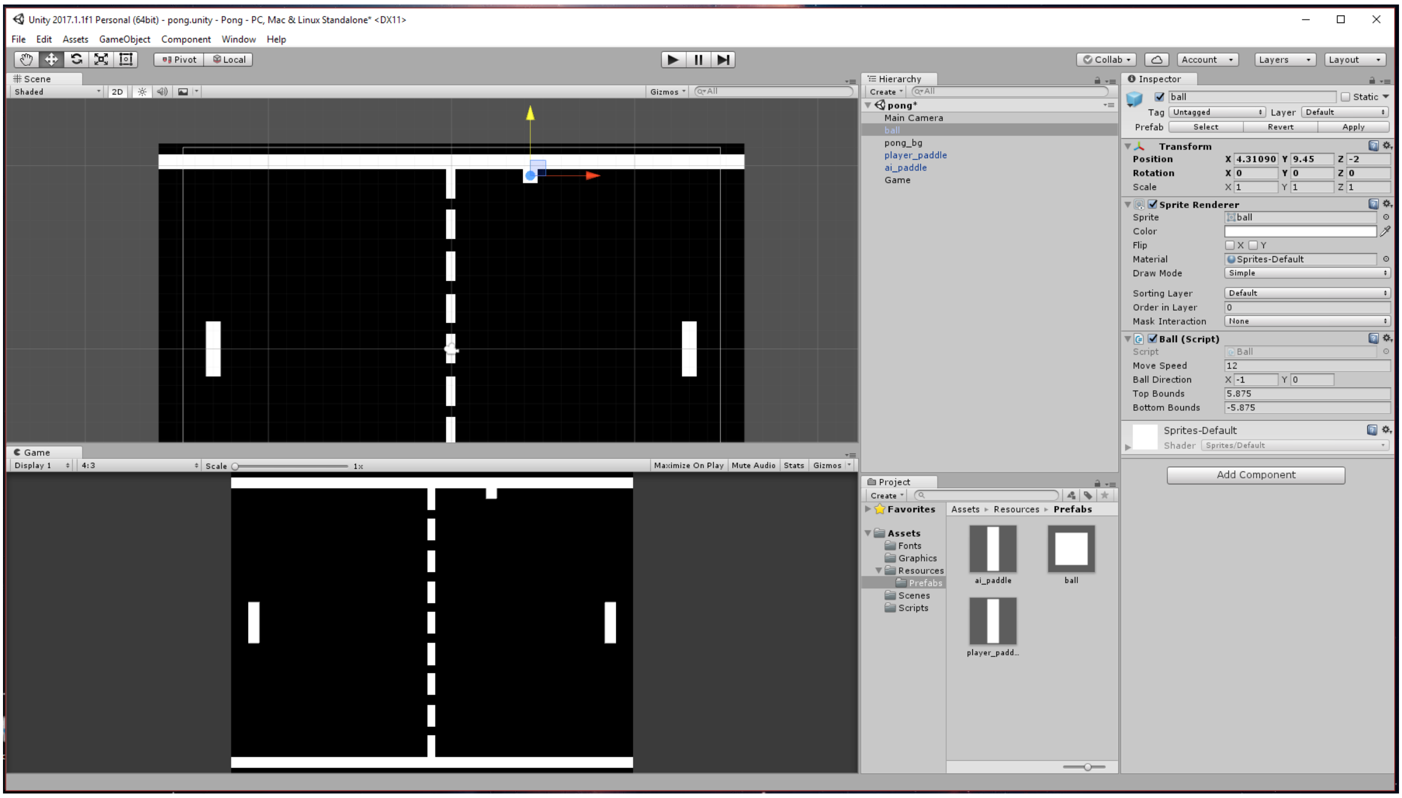
```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;


//Part 3 - For now, I am going to have the Ai Paddle mimic...
//the players movements. To do this, I copied and pasted the code...
//from Player.cs and made a few minor adjustments.
public class Ai : MonoBehaviour {

		//Variables to determine the Movement speed, Top and Bottom boundaries...
		//and the Starting Position.

		public float moveSpeed = 8.0f;
		public float topBounds = 8.3f;
		public float bottomBounds = -8.3f;

		//for the starting position, we changed the value to positive 13...
		//instead of negative.
		public Vector2 startingPosition = new Vector2 (13.0f, 0.0f);


		// Use this for initialization
		void Start () {

		transform.localPosition = (Vector3)startingPosition;
		}

		// Update is called once per frame
		void Update () {

				//Call the method
				CheckUserInput ();

		}

		void CheckUserInput () {

				// check if the user is pressing Up or Down

				if (Input.GetKey (KeyCode.UpArrow)) {
					if (transform.localPosition.y > topBounds) {

						//check to see if while we are moving up,
						//if we are passed the topBounds,
```

Error 2 - Screenshots





```
2 references
public float topBounds = 5.875f;

2 references
public float bottomBounds = -5.875f;
```



ball ☐ Static
Tag Untagged Layer Default
Prefab Select Revert Apply

Transform

Position X 4.31090 Y 9.45 Z -2
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1

☑ **Sprite Renderer**

Sprite ball
Color
Flip ☐ X ☐ Y
Material Sprites-Default
Draw Mode Simple
Sorting Layer Default
Order in Layer 0
Mask Interaction None

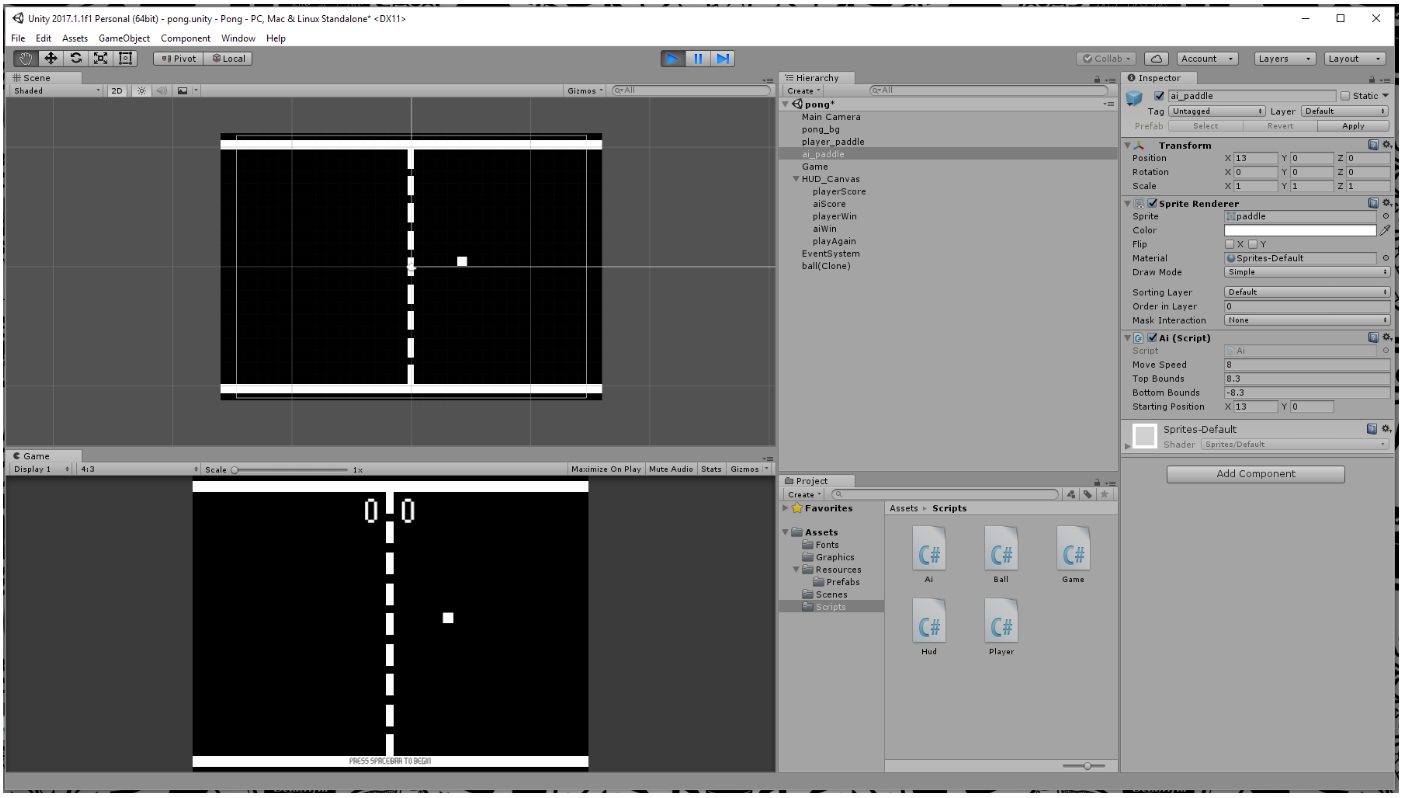
☑ **Ball (Script)**

Script Ball
Move Speed 12
Ball Direction X -1 Y 0
Top Bounds 5.875
Bottom Bounds -5.875

Sprites-Default
Shader Sprites/Default

Add Component

Error 3 - Screenshots



Unity 2017.1.1f1 Personal (64bit) - pong.unity - Pong - PC, Mac & Linux Standalone* <DX11>

Inspector

☑ ai_paddle □ Static

Tag Untagged Layer Default

Prefab Select Revert Apply

Transform

Position X 13 Y 0 Z 0

Rotation X 0 Y 0 Z 0

Scale X 1 Y 1 Z 1

☑ Sprite Renderer

Sprite paddle

Color

Flip □ X □ Y

Material Sprites-Default

Draw Mode Simple

Sorting Layer Default

Order in Layer 0

Mask Interaction None

☑ Ai (Script)

Script Ai

Move Speed 8

Top Bounds 8.3

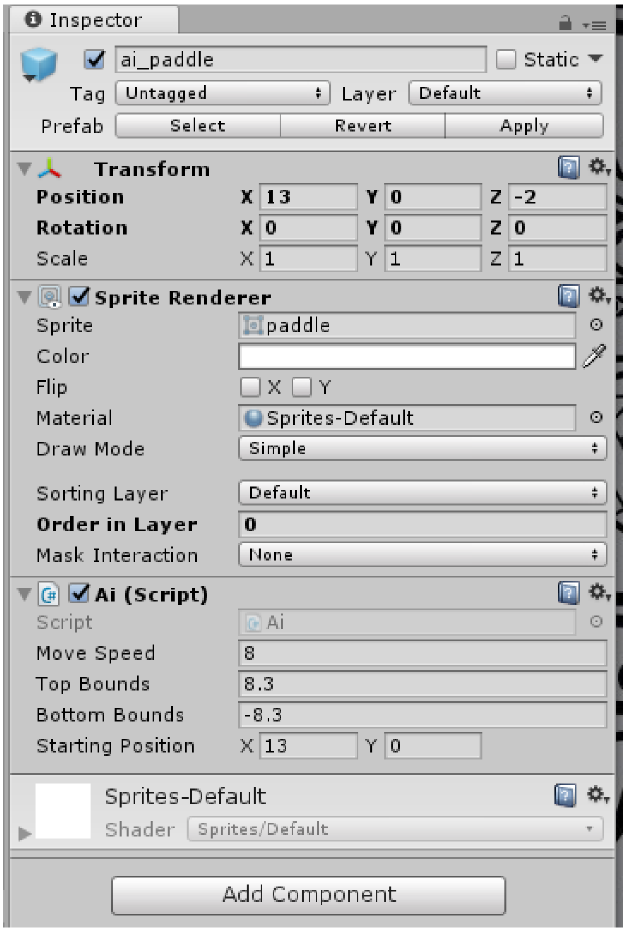
Bottom Bounds -8.3

Starting Position X 13 Y 0

Sprites-Default

Shader Sprites/Default

Add Component



Inspector

☑ ai_paddle □ Static

Tag Untagged Layer Default

Prefab Select Revert Apply

Transform

Position X 13 Y 0 Z -2

Rotation X 0 Y 0 Z 0

Scale X 1 Y 1 Z 1

☑ Sprite Renderer

Sprite paddle

Color

Flip □ X □ Y

Material Sprites-Default

Draw Mode Simple

Sorting Layer Default

Order in Layer 0

Mask Interaction None

☑ Ai (Script)

Script Ai

Move Speed 8

Top Bounds 8.3

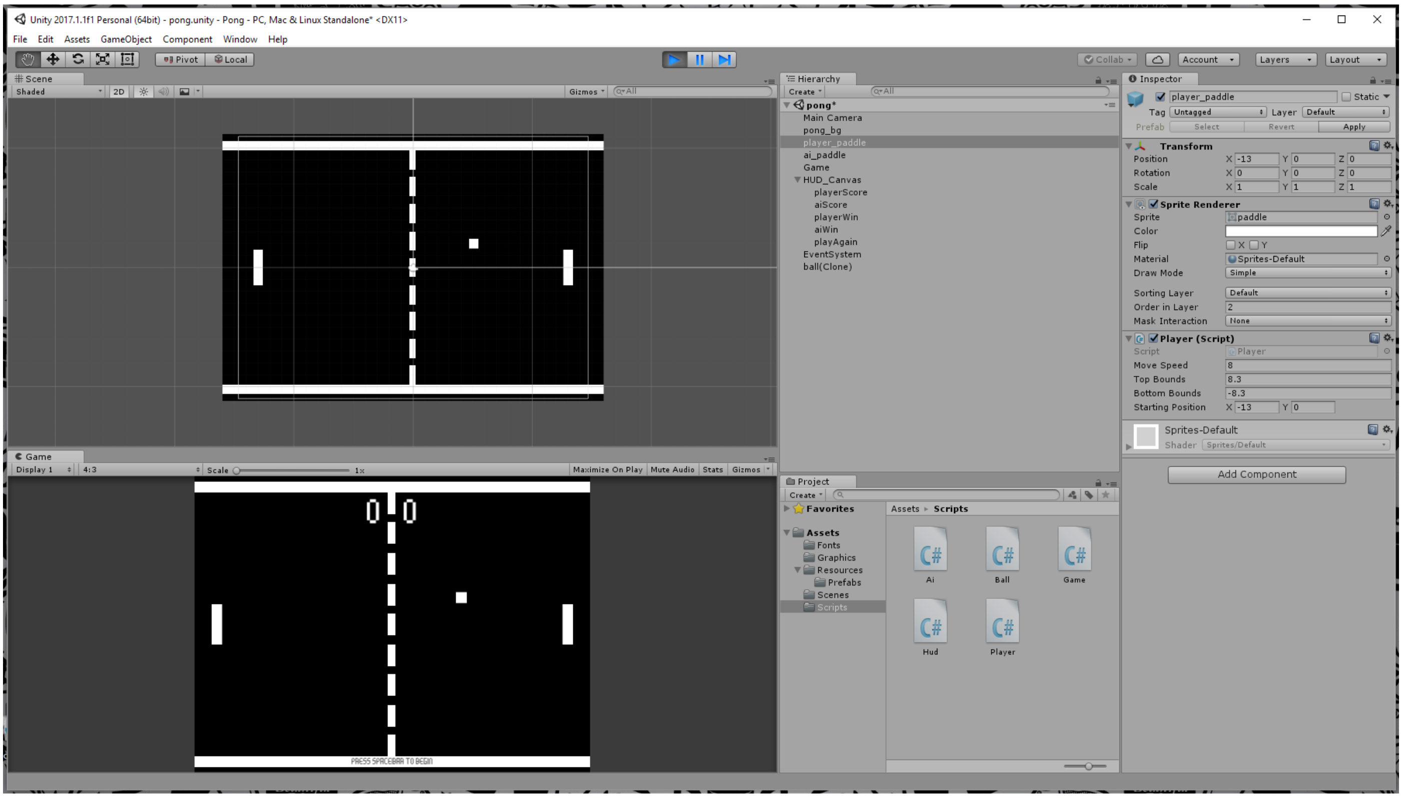
Bottom Bounds -8.3

Starting Position X 13 Y 0

Sprites-Default

Shader Sprites/Default

Add Component



pong*
- Main Camera
- pong_bg
- player_paddle
- ai_paddle
- Game
- HUD_Canvas
  - playerScore
  - aiScore
  - playerWin
  - aiWin
  - playAgain
- EventSystem
- ball(Clone)

☑ player_paddle □ Static

Tag Untagged Layer Default

Prefab Select Revert Apply

Transform

Position	X	-13	Y	0	Z	0
Rotation	X	0	Y	0	Z	0
Scale	X	1	Y	1	Z	1

☑ **Sprite Renderer**

Sprite	paddle
Color	
Flip	□ X □ Y
Material	Sprites-Default
Draw Mode	Simple
Sorting Layer	Default
Order in Layer	2
Mask Interaction	None

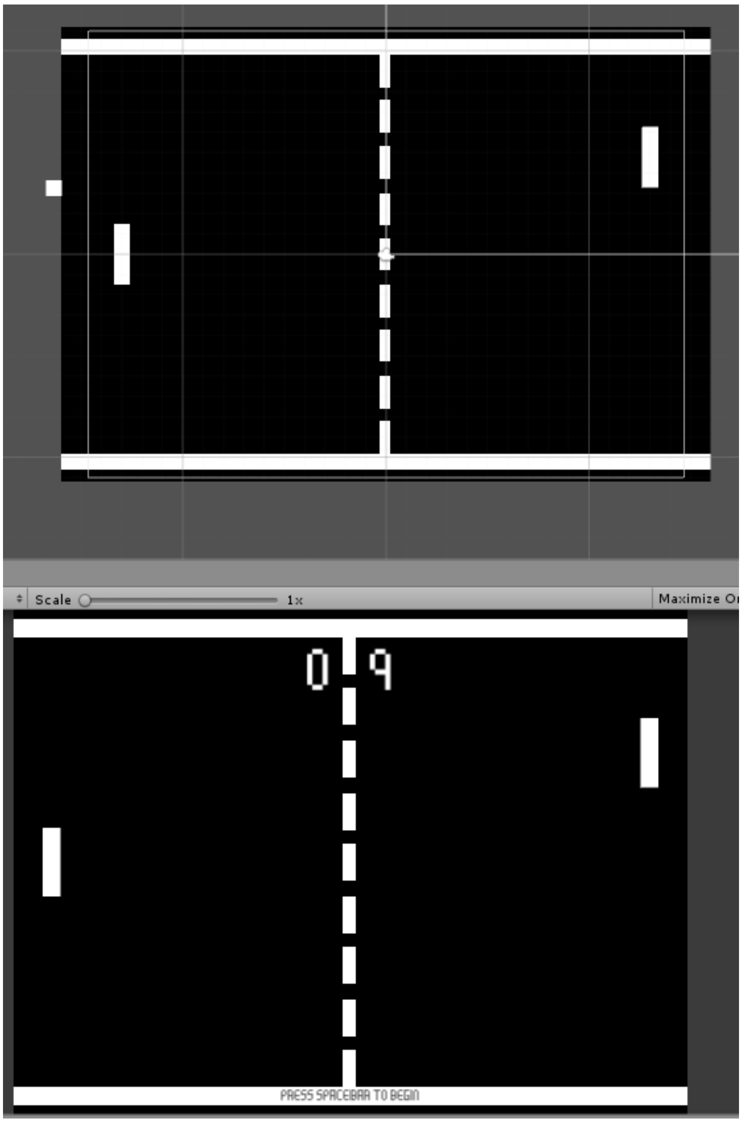
☑ **Player (Script)**

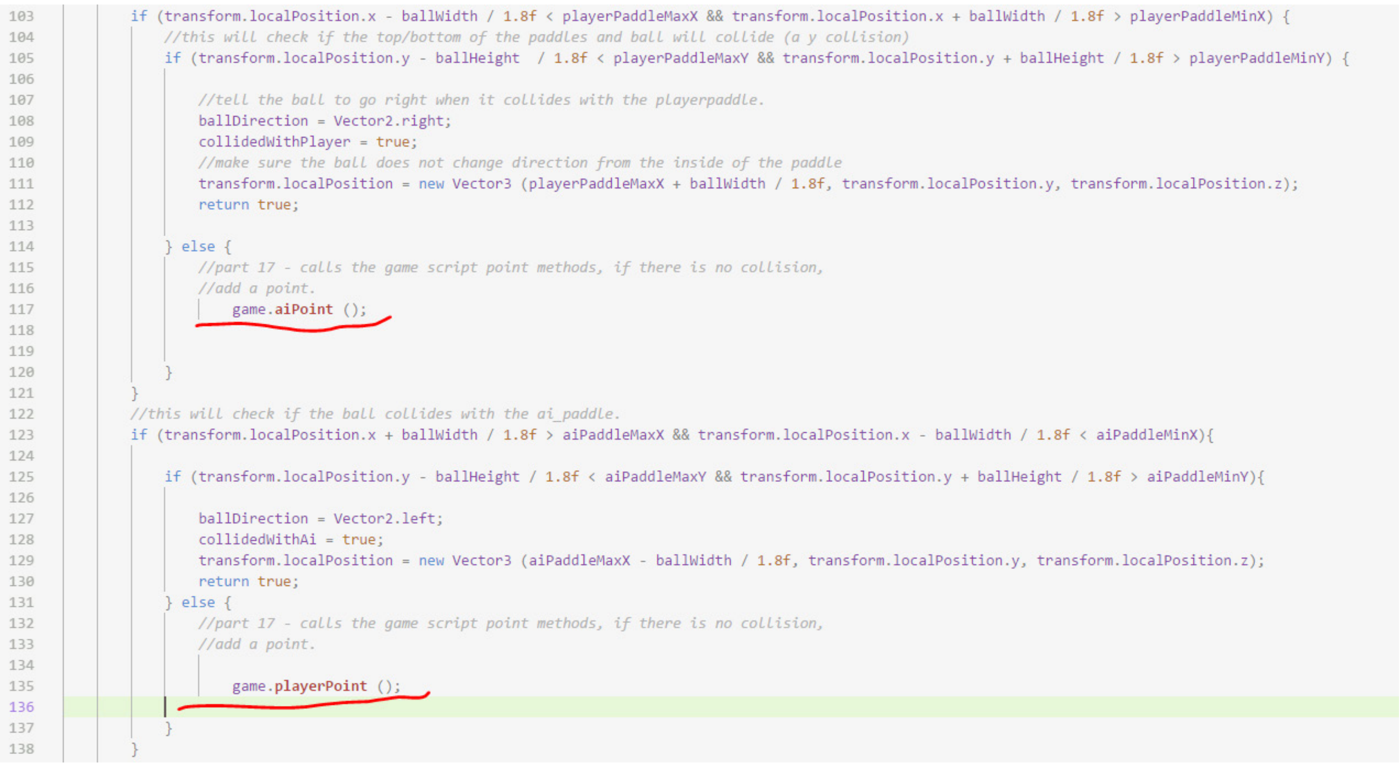
Script	Player
Move Speed	8
Top Bounds	8.3
Bottom Bounds	-8.3
Starting Position	X -13 Y 0

Sprites-Default

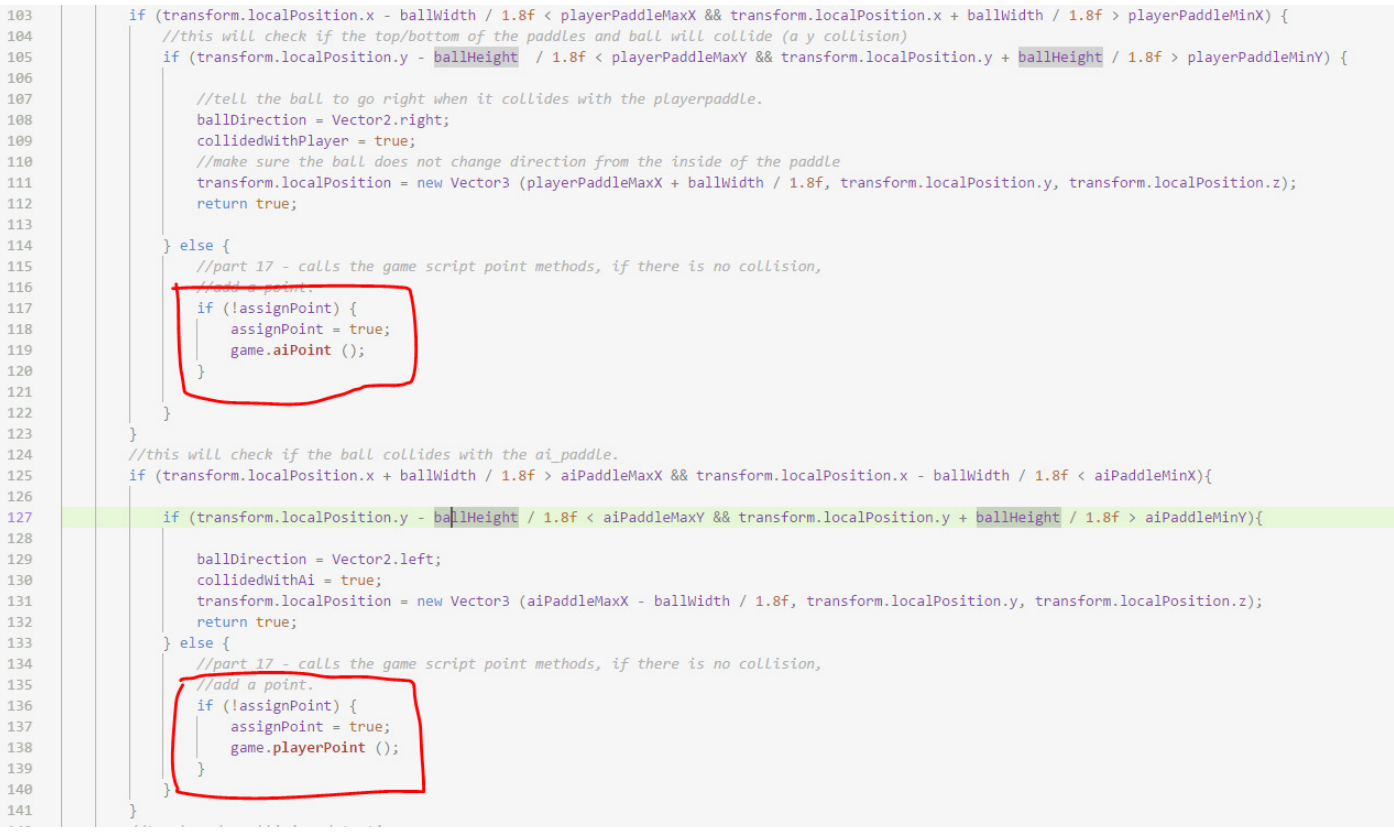
Shader Sprites/Default

Error 4 - Screenshots

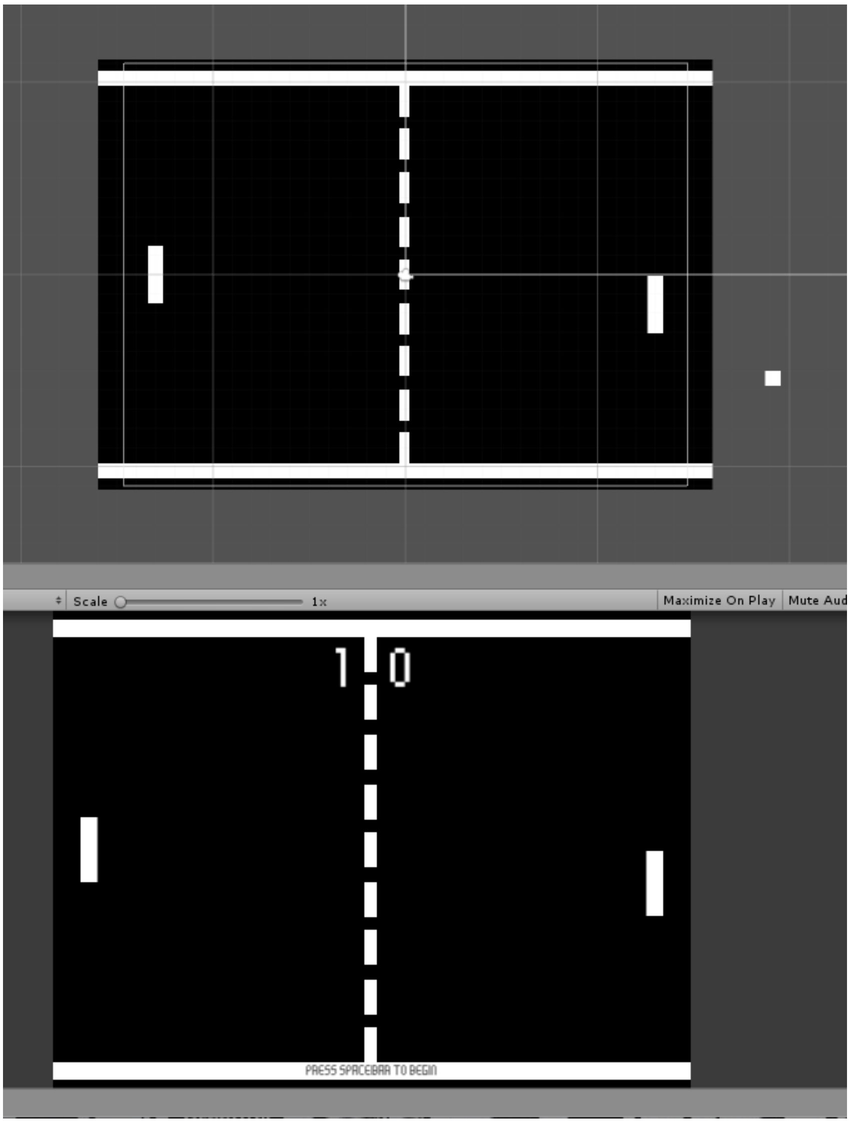




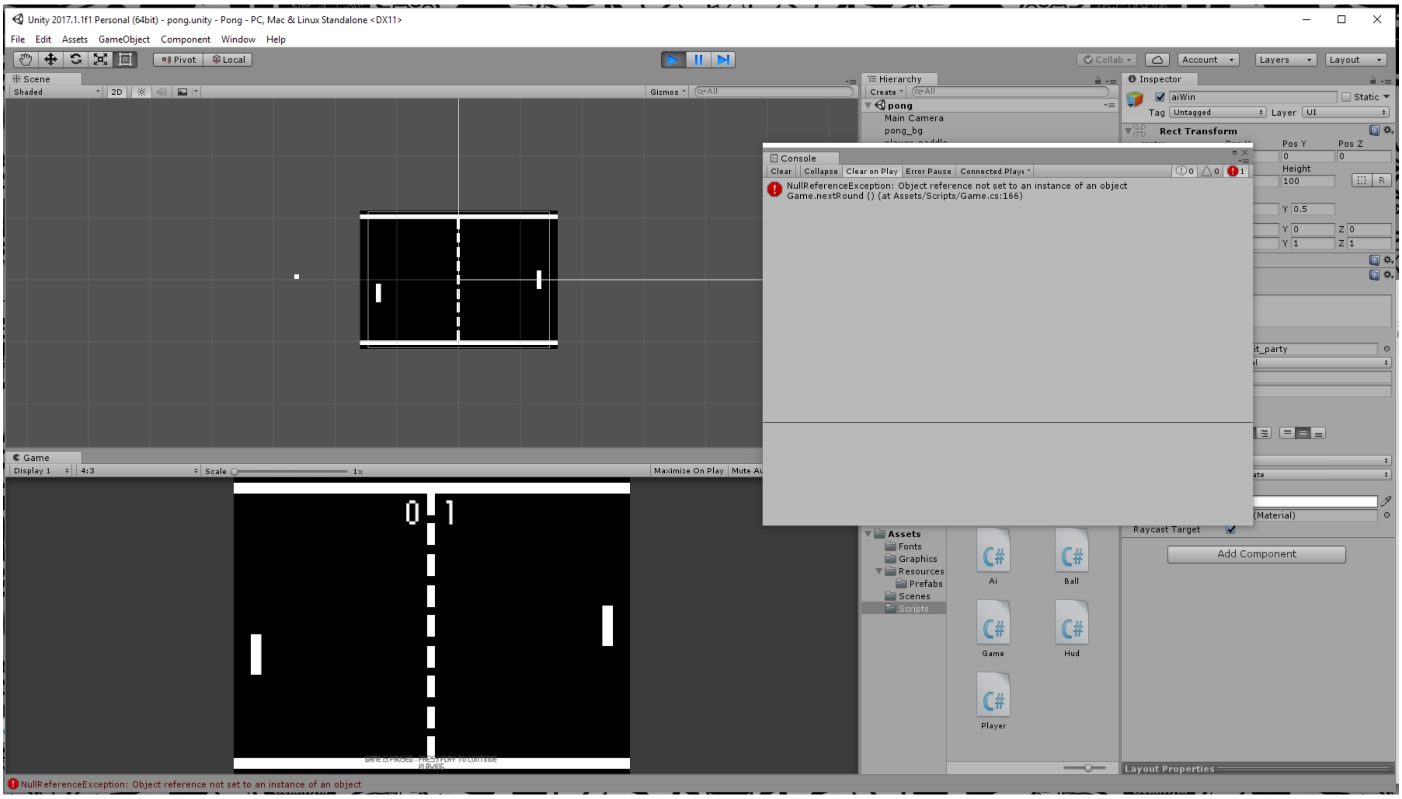
```
if (transform.localPosition.x - ballWidth / 1.8f < playerPaddleMaxX && transform.localPosition.x + ballWidth / 1.8f > playerPaddleMinX) {
    //this will check if the top/bottom of the paddles and ball will collide (a y collision)
    if (transform.localPosition.y - ballHeight  / 1.8f < playerPaddleMaxY && transform.localPosition.y + ballHeight / 1.8f > playerPaddleMinY) {

        //tell the ball to go right when it collides with the playerpaddle.
        ballDirection = Vector2.right;
        collidedWithPlayer = true;
        //make sure the ball does not change direction from the inside of the paddle
        transform.localPosition = new Vector3 (playerPaddleMaxX + ballWidth / 1.8f, transform.localPosition.y, transform.localPosition.z);
        return true;

    } else {
        //part 17 - calls the game script point methods, if there is no collision,
        //add a point.
            game.aiPoint ();


    }
}
//this will check if the ball collides with the ai_paddle.
if (transform.localPosition.x + ballWidth / 1.8f > aiPaddleMaxX && transform.localPosition.x - ballWidth / 1.8f < aiPaddleMinX){

    if (transform.localPosition.y - ballHeight / 1.8f < aiPaddleMaxY && transform.localPosition.y + ballHeight / 1.8f > aiPaddleMinY){

        ballDirection = Vector2.left;
        collidedWithAi = true;
        transform.localPosition = new Vector3 (aiPaddleMaxX - ballWidth / 1.8f, transform.localPosition.y, transform.localPosition.z);
        return true;
    } else {
        //part 17 - calls the game script point methods, if there is no collision,
        //add a point.

            game.playerPoint ();

    }
}
```



```
if (transform.localPosition.x - ballWidth / 1.8f < playerPaddleMaxX && transform.localPosition.x + ballWidth / 1.8f > playerPaddleMinX) {
    //this will check if the top/bottom of the paddles and ball will collide (a y collision)
    if (transform.localPosition.y - ballHeight  / 1.8f < playerPaddleMaxY && transform.localPosition.y + ballHeight / 1.8f > playerPaddleMinY) {

        //tell the ball to go right when it collides with the playerpaddle.
        ballDirection = Vector2.right;
        collidedWithPlayer = true;
        //make sure the ball does not change direction from the inside of the paddle
        transform.localPosition = new Vector3 (playerPaddleMaxX + ballWidth / 1.8f, transform.localPosition.y, transform.localPosition.z);
        return true;

    } else {
        //part 17 - calls the game script point methods, if there is no collision,
        //add a point.
        if (!assignPoint) {
            assignPoint = true;
            game.aiPoint ();
        }

    }
}
//this will check if the ball collides with the ai_paddle.
if (transform.localPosition.x + ballWidth / 1.8f > aiPaddleMaxX && transform.localPosition.x - ballWidth / 1.8f < aiPaddleMinX){

    if (transform.localPosition.y - ballHeight / 1.8f < aiPaddleMaxY && transform.localPosition.y + ballHeight / 1.8f > aiPaddleMinY){

        ballDirection = Vector2.left;
        collidedWithAi = true;
        transform.localPosition = new Vector3 (aiPaddleMaxX - ballWidth / 1.8f, transform.localPosition.y, transform.localPosition.z);
        return true;
    } else {
        //part 17 - calls the game script point methods, if there is no collision,
        //add a point.
        if (!assignPoint) {
            assignPoint = true;
            game.playerPoint ();
        }
    }
}
```

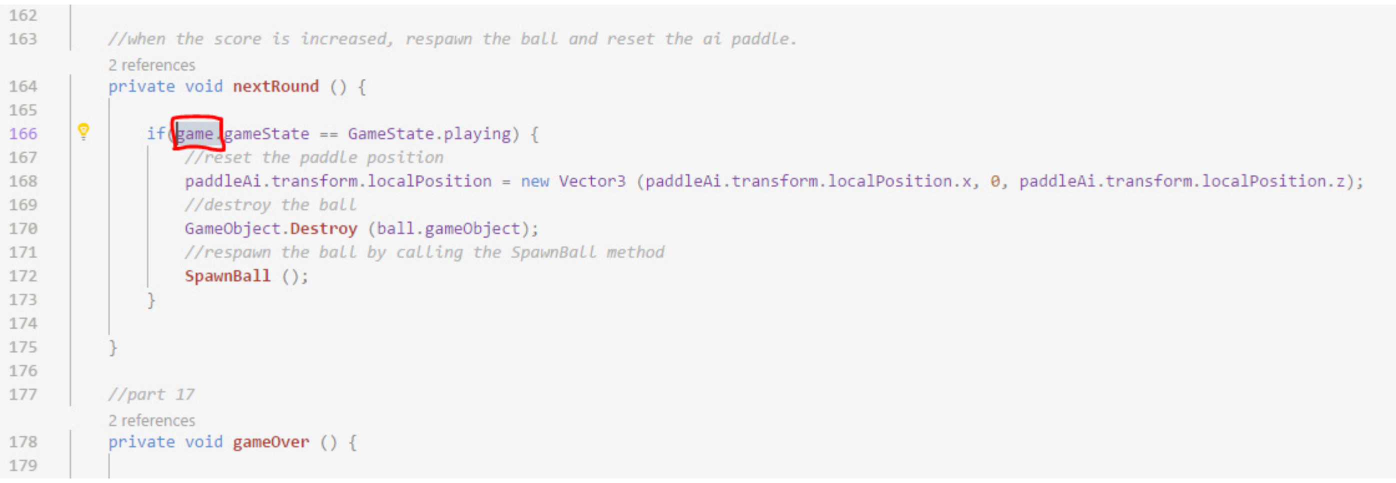


Error 5 - Screenshots

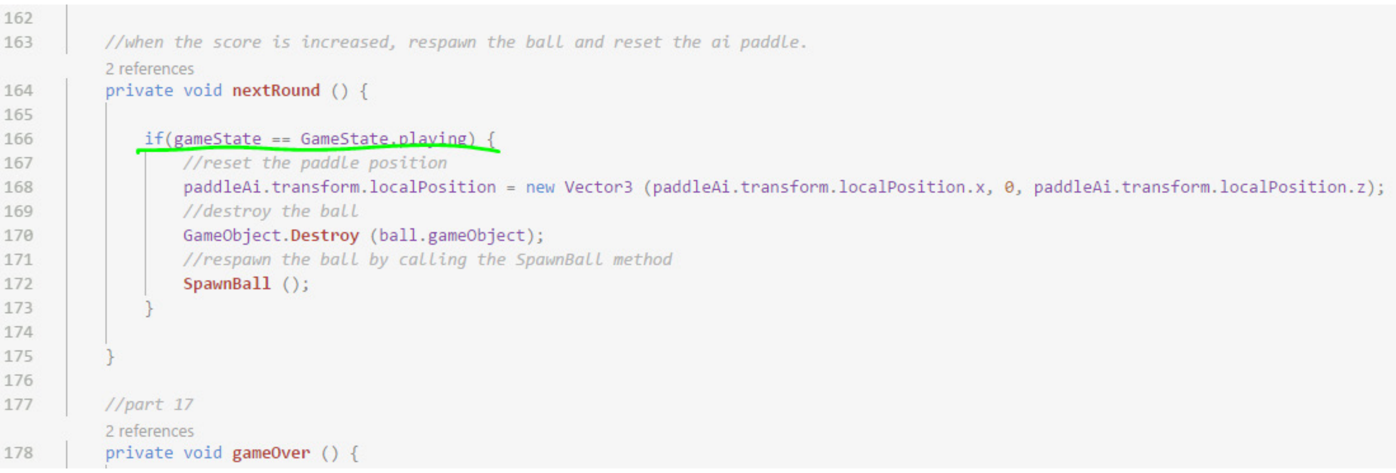


```
NullReferenceException: Object reference not set to an instance of an object
Game.nextRound () (at Assets/Scripts/Game.cs:166)
```

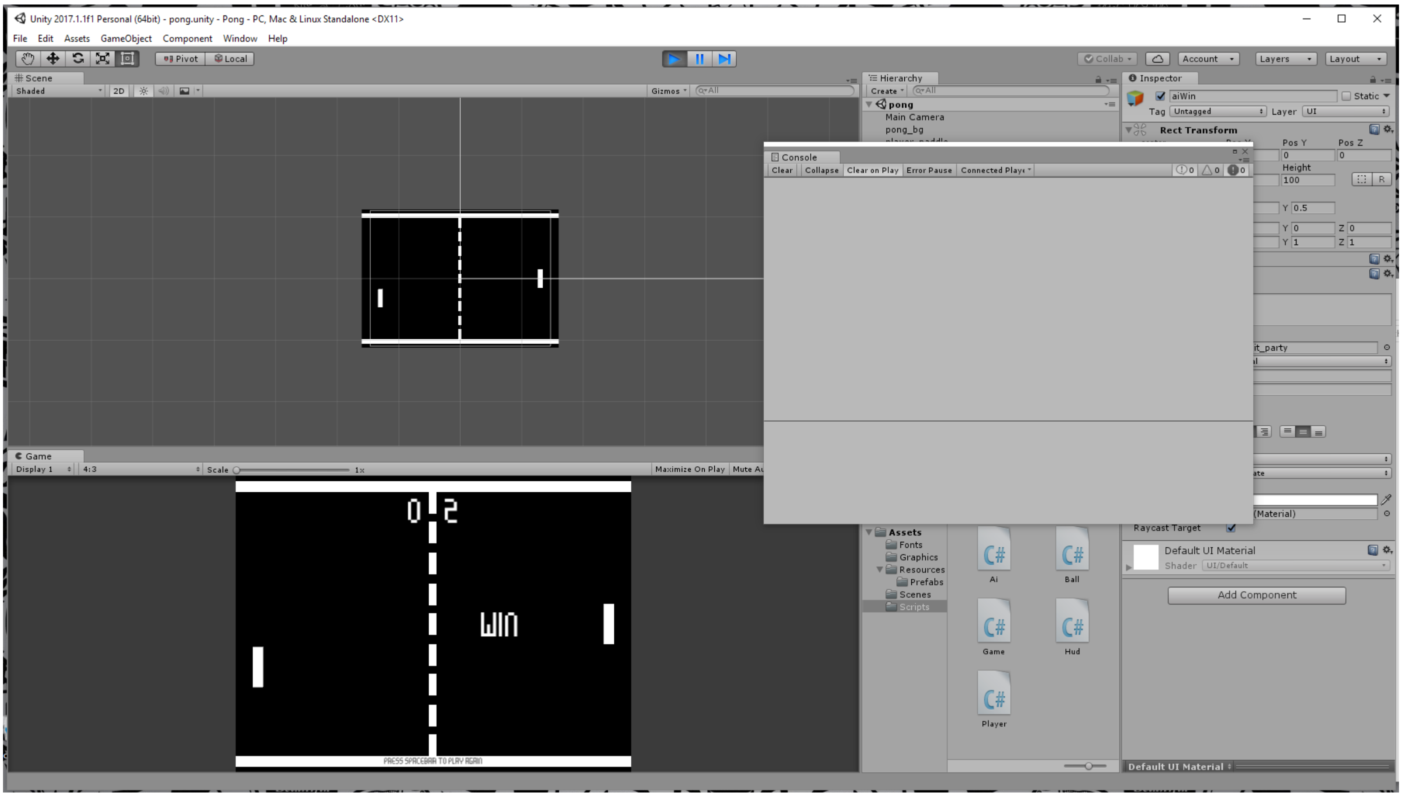
```
NullReferenceException: Object reference not set to an instance of an object
```



```

//when the score is increased, respawn the ball and reset the ai paddle.
2 references
private void nextRound () {

    if(game.gameState == GameState.playing) {
        //reset the paddle position
        paddleAi.transform.localPosition = new Vector3 (paddleAi.transform.localPosition.x, 0, paddleAi.transform.localPosition.z);
        //destroy the ball
        GameObject.Destroy (ball.gameObject);
        //respawn the ball by calling the SpawnBall method
        SpawnBall ();
    }

}

//part 17
2 references
private void gameOver () {

```



```
    //when the score is increased, respawn the ball and reset the ai paddle.
    2 references
    private void nextRound () {

        if(gameState == GameState.playing) {
            //reset the paddle position
            paddleAi.transform.localPosition = new Vector3 (paddleAi.transform.localPosition.x, 0, paddleAi.transform.localPosition.z);
            //destroy the ball
            GameObject.Destroy (ball.gameObject);
            //respawn the ball by calling the SpawnBall method
            SpawnBall ();
        }

    }

    //part 17
    2 references
    private void gameOver () {
```


Unity 2017.1.1f1 Personal (64bit) - pong.unity - Pong - PC, Mac & Linux Standalone <DX11>
File Edit Assets GameObject Component Window Help
Pivot Local
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Scene
Shaded 2D Gizmos
Hierarchy
Create
pong
Main Camera
pong_bg
Inspector
aiWin
Static
Tag Untagged Layer UI
Rect Transform
Pos Y Pos Z
Height
Console
Clear Collapse Clear on Play Error Pause Connected Player
Game
Display 1 4:3 Scale 1x Maximize On Play
0 2
WIN
PRESS SPACEBAR TO PLAY AGAIN
Assets
Fonts
Graphics
Resources
Prefabs
Scenes
Scripts
Ai
Ball
Game
Hud
Player
Raycast Target
Default UI Material
Shader UI/Default
Add Component