TUGAS PERTEMUAN: 10

ENEMY AI AND ATTACK

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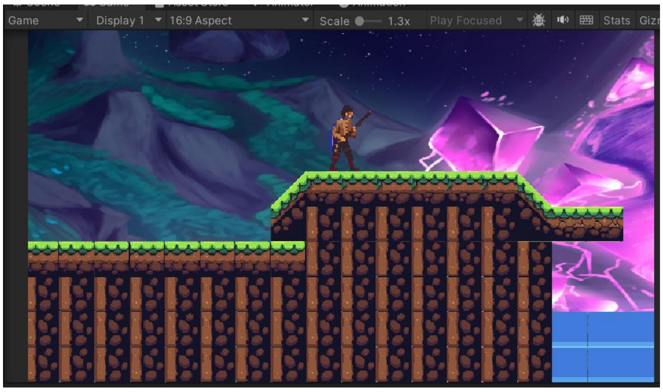
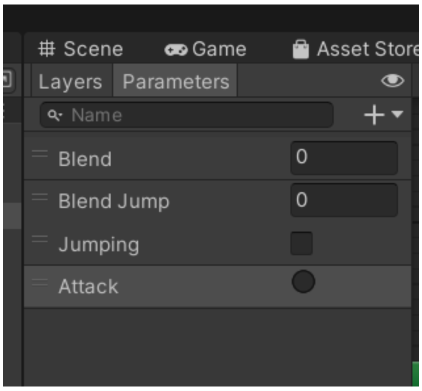
1.1 Tugas 1 : Membuat Enemy AI dan Attack

A. Membuat Mekanisme Attack

1. Bukalah Project unity sebelumnya



2. Tambahkan parameter baru seperti berikut ini.



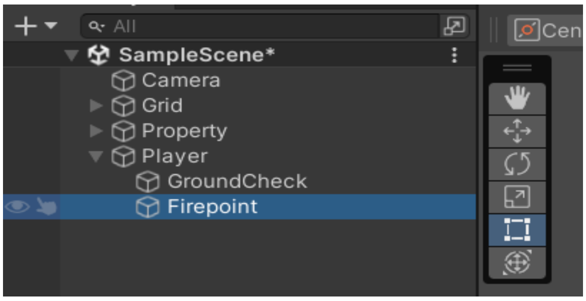
Blend 0

Blend Jump 0

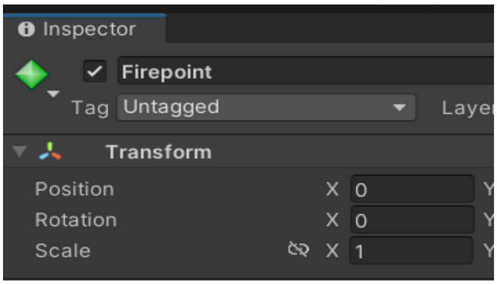
Jumping □

Attack ○

3. Buat objek baru bernama Firepoint di dalam objek player



4. Masuk pada inspector dari Firepoint , lalu rubah warna dari icon berikut.



☑ Firepoint

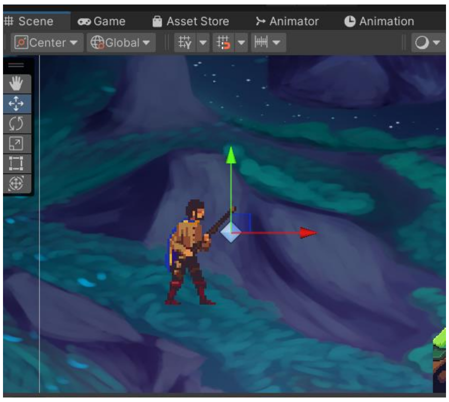
Tag Untagged

Position X 0

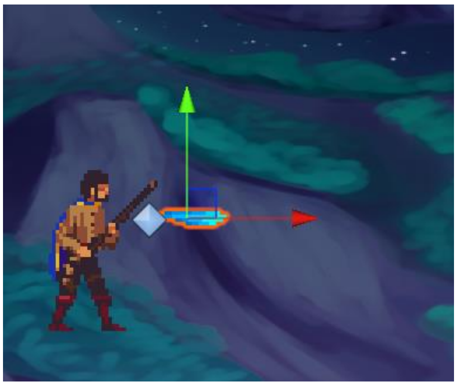
Rotation X 0

Scale X 1

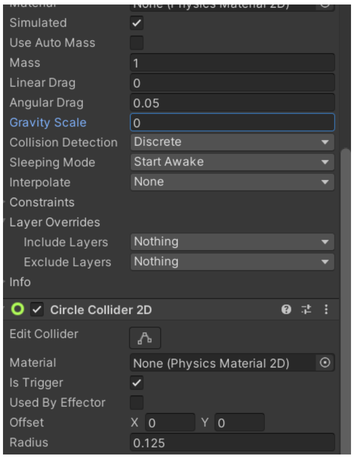
5. Atur posisi bullet seperti gambar berikut ini.



6. Drag and drop asset pedang lalu kita rename menjadi fireball



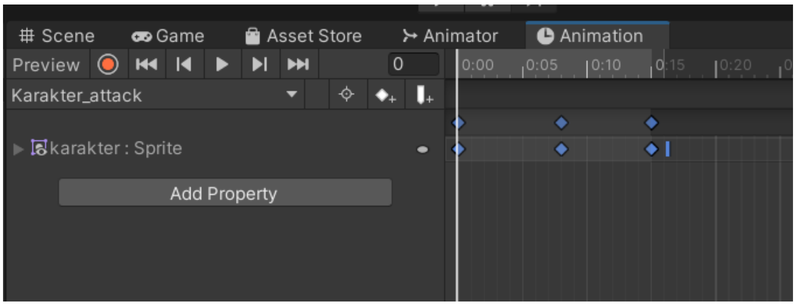
7. Pada objek fireball Add Component circle collider 2D dan rigidbody 2D..



Simulated ☑
Use Auto Mass □
Mass 1
Linear Drag 0
Angular Drag 0.05
Gravity Scale 0
Collision Detection Discrete
Sleeping Mode Start Awake
Interpolate None
Constraints
Layer Overrides
Include Layers Nothing
Exclude Layers Nothing
Info

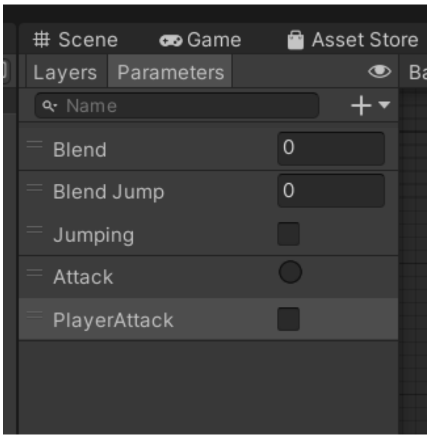
☑ Circle Collider 2D
Edit Collider
Material None (Physics Material 2D)
Is Trigger ☑
Used By Effector □
Offset X 0 Y 0
Radius 0.125

8. Klik karakter, pada tab Animation tambahkan clip karakter_attack, lalu pilih animasi menyerang karakter dan sesuaikan juga durasinya.



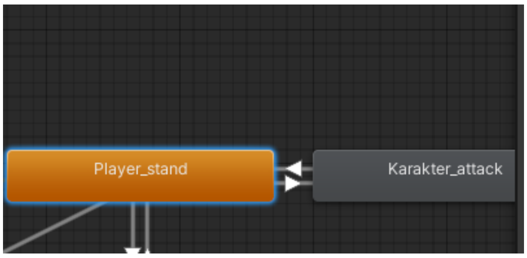
Karakter_attack
karakter : Sprite

9. Pada Tab Animator tambahkan parameter PlayerAttack dengan tipe Bool.

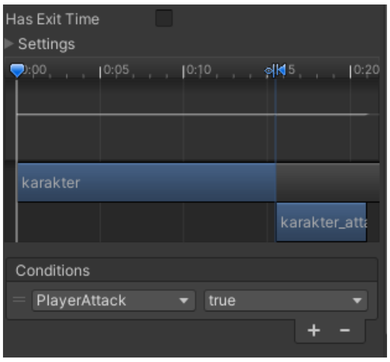


Blend 0
Blend Jump 0
Jumping □
Attack ○
PlayerAttack □

10. Buat Transisi bolak balik dari karakter ke karakter_attack



11. Klik transisi dari karakter ke karakter_attack tambahkan conditions PlayerAttack dan atur menjadi true, atur juga hal yang serupa dengan transisi karakter_attack ke karakter hanya saja nilai dari kondisi menjadi false. Jangan lupa hilangkan has exit time dan transisi duration menjadi 0.



Has Exit Time □

Settings

Conditions

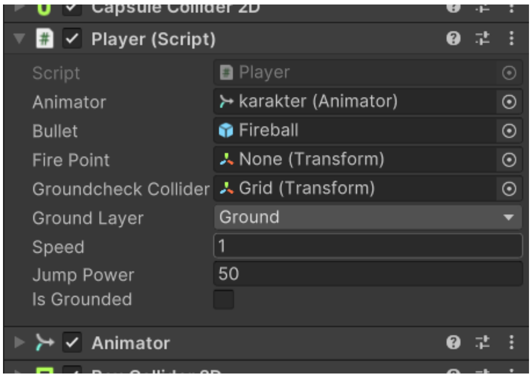
PlayerAttack true

12. Tambahkan source code Pada script Player.cs

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

public class player : MonoBehaviour
{

  public Animator animator;
  public GameObject bullet;
  public Transform firePoint;

  Rigidbody2D rb;
  [SerializeField] Transform groundcheckCollider;
  [SerializeField] LayerMask groundLayer;

  const float groundCheckRadius = 0.2f; // +
  [SerializeField] float speed = 1;
  [SerializeField] float jumpPower = 500;
  float horizontalValue;

  [SerializeField] bool isGrounded; // +
  bool facingRight;
  bool jump;

  void FixedUpdate()
  {
  GroundCheck();
  Move(horizontalValue, jump);
  animator.SetFloat("Blend",Mathf.Abs(rb.velocity.x));
  animator.SetFloat("Blend Jump",rb.velocity.y);
  jump = false;
  }
  IEnumerator Attack()
{

     animator.SetTrigger("Attack");
     yield return new WaitForSeconds(0.25f);
     float direction = facingRight ? 1f : -1f;
     float rotationAngle = facingRight ? -90f : 90f;

                     Quaternion         rotation         =
Quaternion.Euler(0,0,rotationAngle);

          GameObject    fireball    =    Instantiate(bullet,
firePoint.position, Quaternion.identity);
      fireball.GetComponent<Rigidbody2D>().velocity  =  new
Vector2(direction * 10f, 0);

     Destroy(fireball, 2f);
}

  void GroundCheck()
  {
    isGrounded = false;
                   Collider2D[]         colliders          =
Physics2D.OverlapCircleAll(groundcheckCollider.position,
groundCheckRadius, groundLayer);
    if (colliders.Length > 0){
        isGrounded = true;
    }
    animator.SetBool("Jumping",!isGrounded);
  }

  private void Awake()
  {
    rb = GetComponent<Rigidbody2D>();
    animator = GetComponent<Animator>();
  }

  void Update ()
  {
    horizontalValue = Input.GetAxisRaw("Horizontal");
    if (Input.GetButtonDown("Jump")){
      animator.SetBool("Jumping",true);
      jump = true;
    }
    else if (Input.GetButtonUp("Jump")){
        jump = false;
    }
    if (Input.GetKeyDown(KeyCode.C))
    {
        StartCoroutine(Attack());
        animator.SetBool("PlayerAttack", true);
    }
    else if (Input.GetKeyUp(KeyCode.C))
    {
        animator.SetBool("PlayerAttack", false);
    }
}
  void Move(float dir, bool jumpflag)
  {
    #region gerak kanan kiri
    float xVal = dir * speed * 100 * Time.fixedDeltaTime;
        Vector2   targetVelocity   =   new   Vector2(xVal,
rb.velocity.y);
```

```
    rb.velocity = targetVelocity;

    if (facingRight && dir < 0)
    {
      // ukuran player
      transform.localScale = new Vector3(4, 4, 1);
      facingRight = false;
    }

    else if (!facingRight && dir > 0)
    {
      // ukuran player
      transform.localScale = new Vector3(4, 4, 1);
      facingRight = true;
    }
    if(isGrounded && jumpflag)
    {
        isGrounded = false;
        jumpflag = false;
        rb.AddForce(new Vector2(2f, jumpPower));
    }
    #endregion
  }
}
```

13. Atur inpector pada player bagian player Script seperti berikut ini.



Capsule Collider 2D

Player (Script)

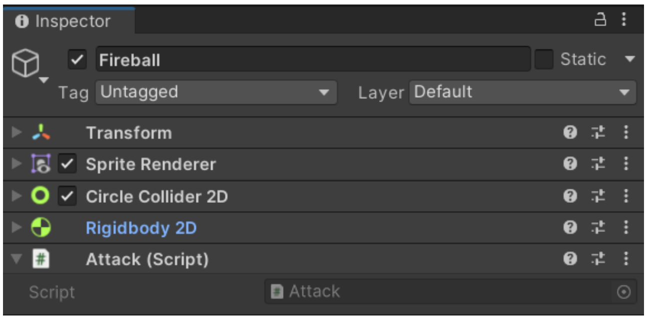
Script: Player
Animator: karakter (Animator)
Bullet: Fireball
Fire Point: None (Transform)
Groundcheck Collider: Grid (Transform)
Ground Layer: Ground
Speed: 1
Jump Power: 50
Is Grounded: □

Animator

14. buat script baru dengan nama Attack, Tambahkan source code berikut ke dalam file Attack.cs

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

public class Attack : MonoBehaviour
{
    private void OnTriggerEnter2D(Collider2D collision)
    {
        if (collision.gameObject.CompareTag("Enemy"))
        {
            Destroy(gameObject);
            Destroy(collision.gameObject);
        }
    }
}
```

15. Drag & drop file script Attack ke objek fireball



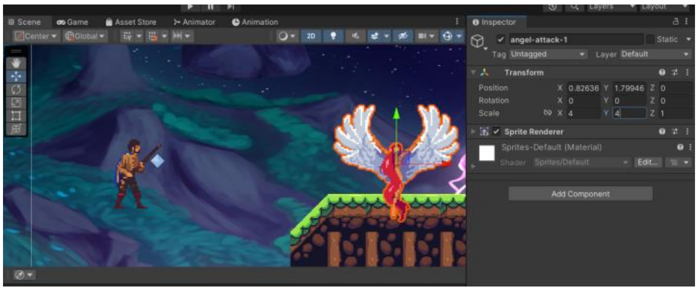
☑ Fireball

Tag Untagged

Layer Default

Script Attack

16. Tambahkan asset musuh 1 pada scene game



☑ angel-attack-1

Tag Untagged Layer Default

Position X 0.82636 Y 1.79946 Z 0

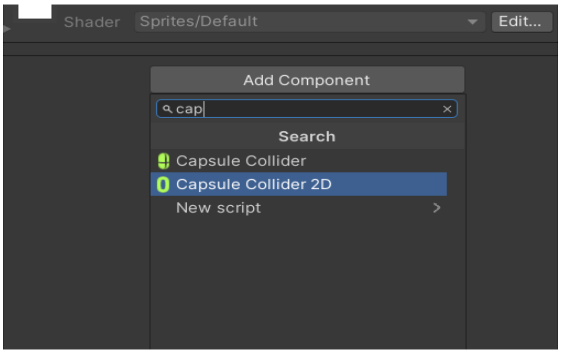
Rotation X 0 Y 0 Z 0

Scale X 4 Y 4 Z 1

Sprites-Default (Material)

Shader Sprites/Default

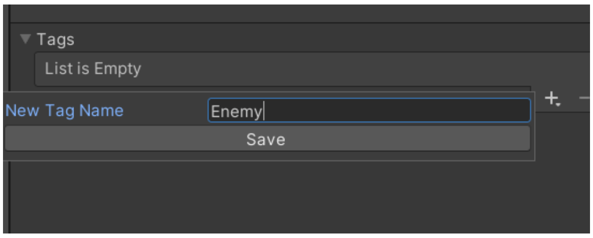
17. Pada objek musuh 1 Add Component capsule collider 2D



Shader Sprites/Default

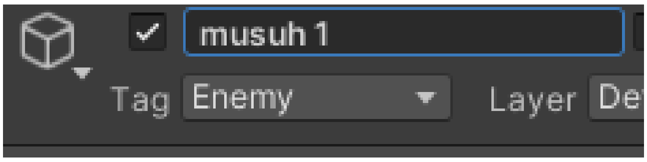
cap

18. Tambahkan tag bernama enemy



New Tag Name Enemy

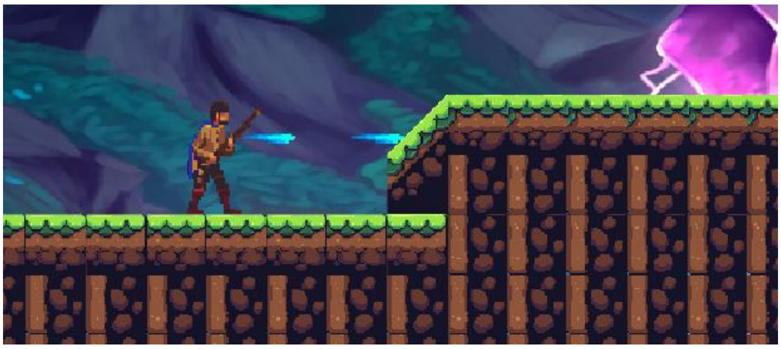
19. Pada objek musuh 1 pilih tag enemy


☑ musuh 1

Tag Enemy

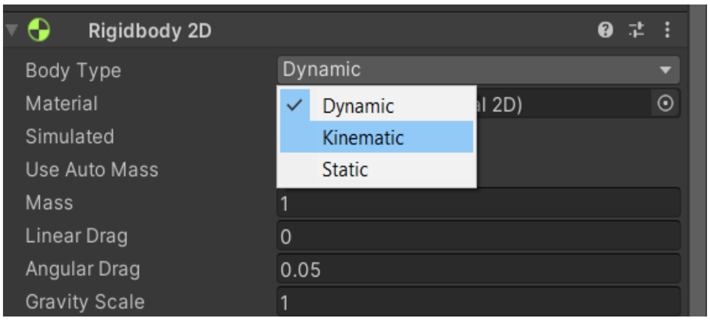
Layer De

20. Hasil Attack



B. Membuat Enemy Behavior NPC

1. Pada objek musuh 1 tambahkan komponen Capsule Collider 2D dan RigidBody 2DPada komponen RigidBody 2D ubah tipe body menjadi Kinematic.

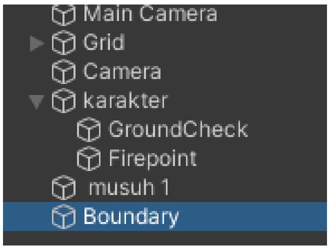


Rigidbody 2D

Body Type: Dynamic
- ✓ Dynamic
- Kinematic
- Static

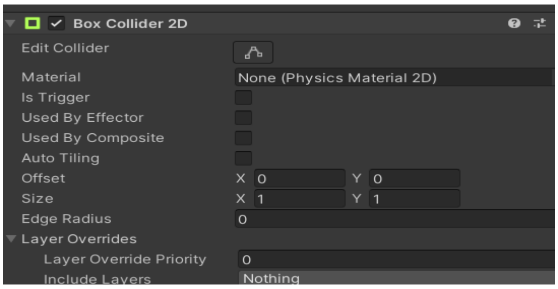
Material: l 2D)
Simulated
Use Auto Mass
Mass: 1
Linear Drag: 0
Angular Drag: 0.05
Gravity Scale: 1

2. Tambahkan objek empty, lalu ubah nama menjadi Boundary



- Main Camera
- Grid
- Camera
- karakter
  - GroundCheck
  - Firepoint
- musuh 1
- Boundary

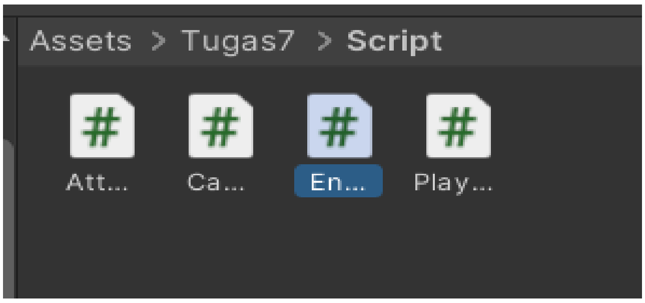
3. Pada objek baru tersebut, tambahkan komponen Box Collider 2D



☑ Box Collider 2D

Edit Collider
Material: None (Physics Material 2D)
Is Trigger: □
Used By Effector: □
Used By Composite: □
Auto Tiling: □
Offset: X 0 Y 0
Size: X 1 Y 1
Edge Radius: 0
Layer Overrides
Layer Override Priority: 0
Include Layers: Nothing

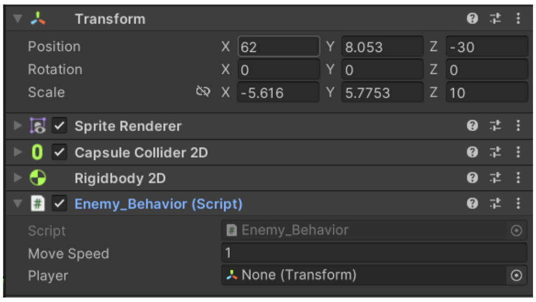
4. Buat file script baru bernama Enemy_Behavior



5. Tambahkan source code berikut pada file script Enemy_Behavior.cs

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class Enemy_Behavior : MonoBehaviour
{
    [SerializeField] float moveSpeed = 1f;
    Rigidbody2D rb;

    void Start()
    {
        rb = GetComponent<Rigidbody2D>();
    }
    void Update()
    {
        if (isFacingRight())
        {
            rb.velocity = new Vector2(moveSpeed, 0f);
        }
        else
        {
            rb.velocity = new Vector2(-moveSpeed, 0f);
        }
    }
    private bool isFacingRight()
    {
        return transform.localScale.x > Mathf.Epsilon;
    }
    private void OnTriggerExit2D(Collider2D collision)
    {
                transform.localScale   =   new   Vector2(-
transform.localScale.x, transform.localScale.y);
    }
}
```

6. Drag and drop file script Enemy_Behavior ke Musuh_1.

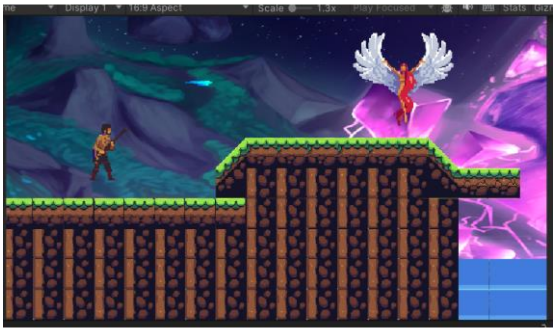


Transform

Position	X 62	Y 8.053	Z -30
Rotation	X 0	Y 0	Z 0
Scale	X -5.616	Y 5.7753	Z 10

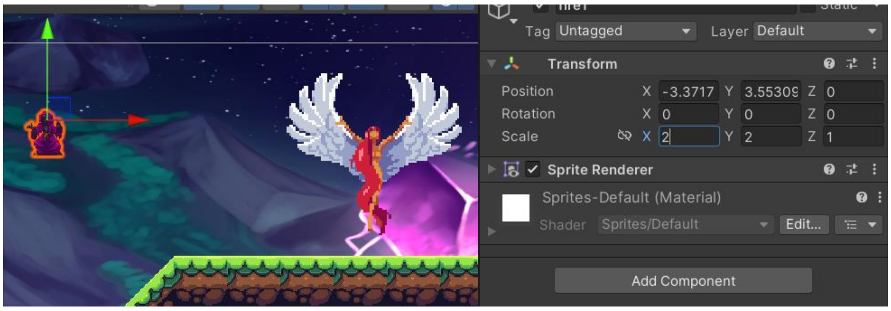
Script	Enemy_Behavior
Move Speed	1
Player	None (Transform)

7. Hasil Uji



C. Membuat Enemy AI

1. Tambahkan musuh baru pada hierarcy

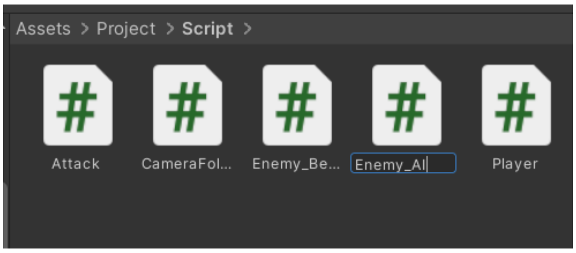


Tag Untagged Layer Default

Transform

Position	X -3.3717	Y 3.55309	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 2	Y 2	Z 1

2. tambahkan script baru,dengan nama Enemy_AI



3. Masukkan source code brikut pada file script Enemy_AI.cs

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

public class Enemy_AI : MonoBehaviour
{
    public float speed; // Kecepatan gerakan musuh
```

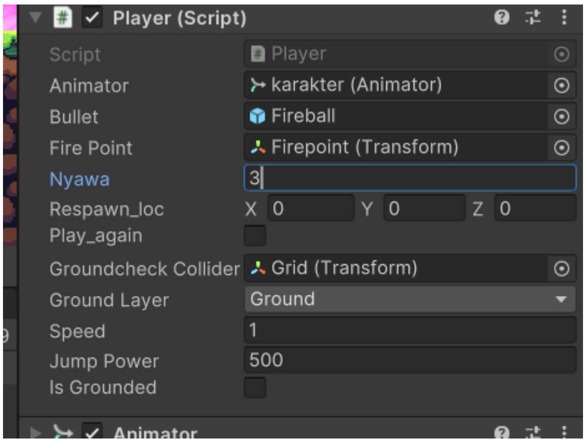
```
          public  float  lineOfSite;  //  Jarak  penglihatan
      musuh
          private  Transform  player;  //  Transform  dari
      pemain
          private Vector2 initialPosition; // Posisi awal
      musuh
          void Start(){
              player                                        =
      GameObject.FindGameObjectWithTag("Player").transform
      ;
              // Menyimpan posisi awal musuh
              initialPosition                               =
      GetComponent<Transform>().position;
          }
          void Update(){
              float           distanceToPlayer              =
      Vector2.Distance(player.position,
      transform.position);
              if (distanceToPlayer < lineOfSite){
                  transform.position                        =
      Vector2.MoveTowards(this.transform.position,
      player.position, speed * Time.deltaTime);
              }
              else{
                  transform.position                        =
      Vector2.MoveTowards(transform.position,
      initialPosition, speed * Time.deltaTime);
              }
          }
          private void OnDrawGizmosSelected()
          {
              Gizmos.color = Color.red;
              Gizmos.DrawWireSphere(transform.position,
      lineOfSite);
          }
}
```

D. Respawn

1. Buat Source code player menjadi seperti berikut

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

public class player : MonoBehaviour
{

  public Animator animator;
  public GameObject bullet;
  public Transform firePoint;
  public int nyawa;
  [SerializeField] Vector3 respawn_loc;
  public bool play_again;
  Rigidbody2D rb;
  [SerializeField] Transform groundcheckCollider;
  [SerializeField] LayerMask groundLayer;

  const float groundCheckRadius = 0.2f; // +
  [SerializeField] float speed = 1;
  [SerializeField] float jumpPower = 500;
  float horizontalValue;

  [SerializeField] bool isGrounded; // +
  bool facingRight;
  bool jump;

  void FixedUpdate()
  {
  GroundCheck();
  Move(horizontalValue, jump);
   animator.SetFloat("Blend",Mathf.Abs(rb.velocity.x))
;
  animator.SetFloat("Blend Jump",rb.velocity.y);
  jump = false;
  }
  IEnumerator Attack()
{

     animator.SetTrigger("Attack");
     yield return new WaitForSeconds(0.25f);

     float direction = facingRight ? 1f : -1f;
     float rotationAngle = facingRight ? -90f : 90f;

                   Quaternion        rotation        =
Quaternion.Euler(0,0,rotationAngle);

        GameObject   fireball   =   Instantiate(bullet,
firePoint.position, Quaternion.identity);
      fireball.GetComponent<Rigidbody2D>().velocity  =
new Vector2(direction * 10f, 0);

     Destroy(fireball, 2f);
}

  void GroundCheck()
  {
    isGrounded = false;
                 Collider2D[]       colliders       =
Physics2D.OverlapCircleAll(groundcheckCollider.positi
on, groundCheckRadius, groundLayer);
    if (colliders.Length > 0){
        isGrounded = true;
    }
    animator.SetBool("Jumping",!isGrounded);
  }
  void playagain(){
      if(play_again == true){
        nyawa = 3;
        transform.position = respawn_loc;
        play_again = false;
      }
  }
  private void Awake()
  {
    rb = GetComponent<Rigidbody2D>();
    animator = GetComponent<Animator>();
    respawn_loc = transform.position;
  }

  void Update ()
  {
    horizontalValue = Input.GetAxisRaw("Horizontal");
    if (Input.GetButtonDown("Jump")){
      animator.SetBool("Jumping",true);
      jump = true;
    }
    else if (Input.GetButtonUp("Jump")){
        jump = false;
    }
    if (Input.GetKeyDown(KeyCode.C))
    {
        StartCoroutine(Attack());
        animator.SetBool("PlayerAttack", true);
    }
    else if (Input.GetKeyUp(KeyCode.C))
    {
        animator.SetBool("PlayerAttack", false);
    }
    if (nyawa < 0){
      playagain();
    }
    if(transform.position.y<-10){
      play_again = true;
      playagain();
    }
}

  void Move(float dir, bool jumpflag)
  {
    #region gerak kanan kiri
        float   xVal   =   dir   *   speed   *   100   *
Time.fixedDeltaTime;
       Vector2  targetVelocity  =  new  Vector2(xVal,
rb.velocity.y);
    rb.velocity = targetVelocity;

    if (facingRight && dir < 0)
    {
      // ukuran player
      transform.localScale = new Vector3(4, 4, 1);
      facingRight = false;
    }

    else if (!facingRight && dir > 0)
    {
      // ukuran player
      transform.localScale = new Vector3(4, 4, 1);
      facingRight = true;
    }
    if(isGrounded && jumpflag)
    {
        isGrounded = false;
        jumpflag = false;
        rb.AddForce(new Vector2(2f, jumpPower));
    }
    #endregion
  }
}
```

2. Pada Player ubah nyawa menjadi 3



Player (Script)

Script	Player
Animator	karakter (Animator)
Bullet	Fireball
Fire Point	Firepoint (Transform)
Nyawa	3
Respawn_loc	X 0 Y 0 Z 0
Play_again	□
Groundcheck Collider	Grid (Transform)
Ground Layer	Ground
Speed	1
Jump Power	500
Is Grounded	□

A. Melengkapi Script

```
using UnityEngine;
public class PlayerAttack : MonoBehaviour
{
    public float attackRange = 2.0f;
    public int attackDamage = 10;
    public string enemyTag = "Enemy";
    void Update()
    {
        if (Input.GetButtonDown("Fire1"))
        {
            PerformMeleeAttack();
        }
    }
    void PerformMeleeAttack()
    {
        RaycastHit hit;
        if (Physics.Raycast(transform.position,
transform.forward, out hit, attackRange))
        {
            if (hit.collider.CompareTag(enemyTag))
            {Health healthComponent =
hit.collider.GetComponent<Health>();
                if (healthComponent != null)
                {
                 healthComponent.TakeDamage(attackDamage);
                }
            }
        }
    }
}
```

Penjelasan :

Metode `PerformMeleeAttack()` telah mengalami beberapa pembaruan penting. Pertama, tipe data `attackRange` diubah dari `int` menjadi `float` untuk mencerminkan penggunaan jarak serangan dengan lebih akurat. Kesalahan penulisan pada `InputGetButtonDown` telah diperbaiki menjadi `Input.GetButtonDown`, dan `attacDamage` dikoreksi menjadi `attackDamage`. Selain itu, tag `enemyTag` ditambahkan untuk memastikan hanya objek dengan tag tersebut yang dianggap sebagai musuh dan menerima serangan. Dalam metode `PerformMeleeAttack`, ditambahkan pemeriksaan untuk memastikan objek yang terkena raycast memiliki komponen `Health`, yang berfungsi untuk mengurangi health musuh dan mengelola kondisi kematian mereka jika health mencapai nol.