互動程式設計三 期中專案

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期中專案的 Repo：https://github.com/kyynk/RPG_mid

遊戲簡介

可由兩名玩家操控角色進行回合制戰鬥，在戰鬥過程中會觸發隨機的事件像是回血、暴擊和爆炸。

如何遊玩

可以用滑鼠點擊按鈕，或是使用鍵盤按鍵。

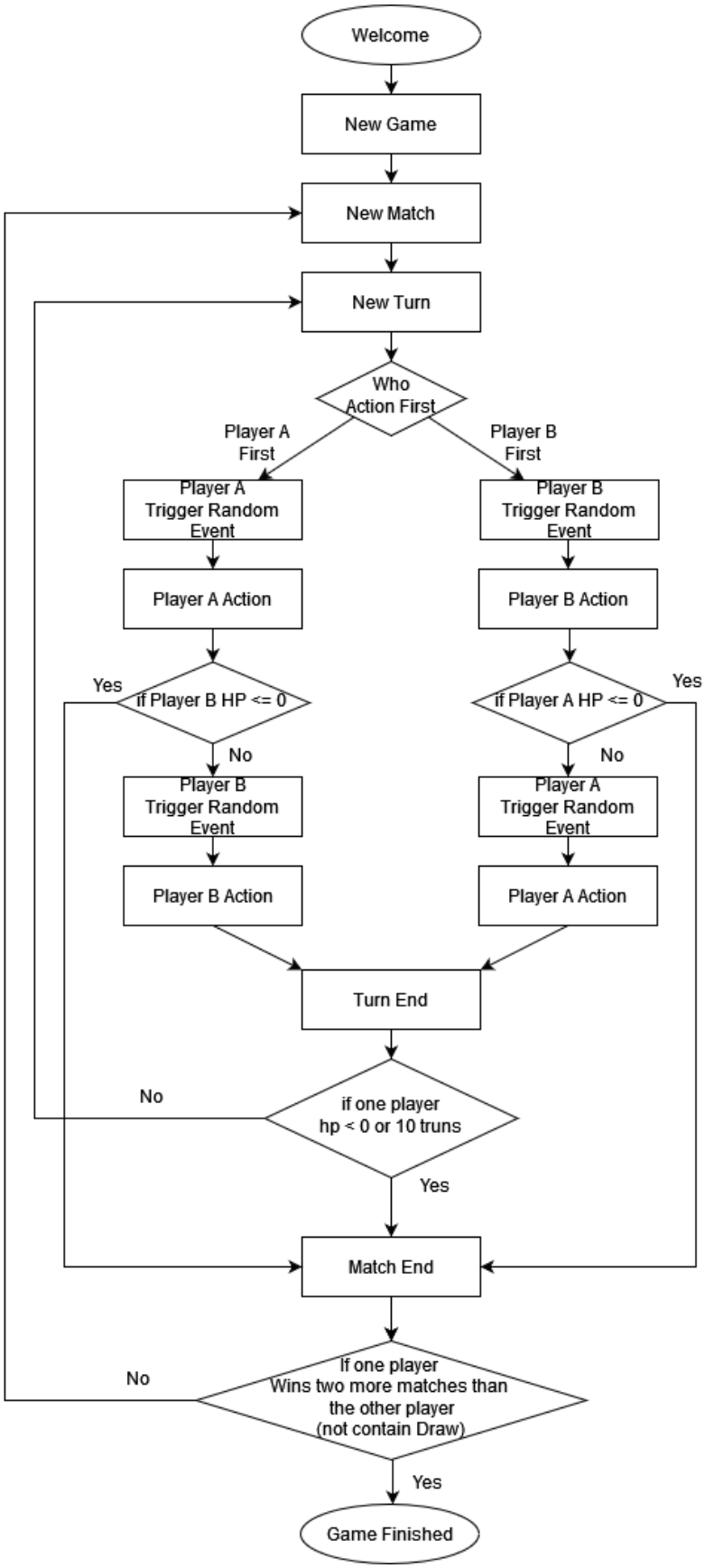
在 Welcome Page 時，可以先點擊 HINT 或是按下 h 鍵，觀看此遊戲的鍵位設定，其中 tab 可以觀察現在的 debug 訊息。

此遊戲的鍵位攻擊是按下 a，防禦是 d，出現有文字的按鈕時，可以直接按下鍵盤上對應到按鈕的第一個英文字去觸發。

繳交內容

Flowchart、Class Diagram 和 Source Code。

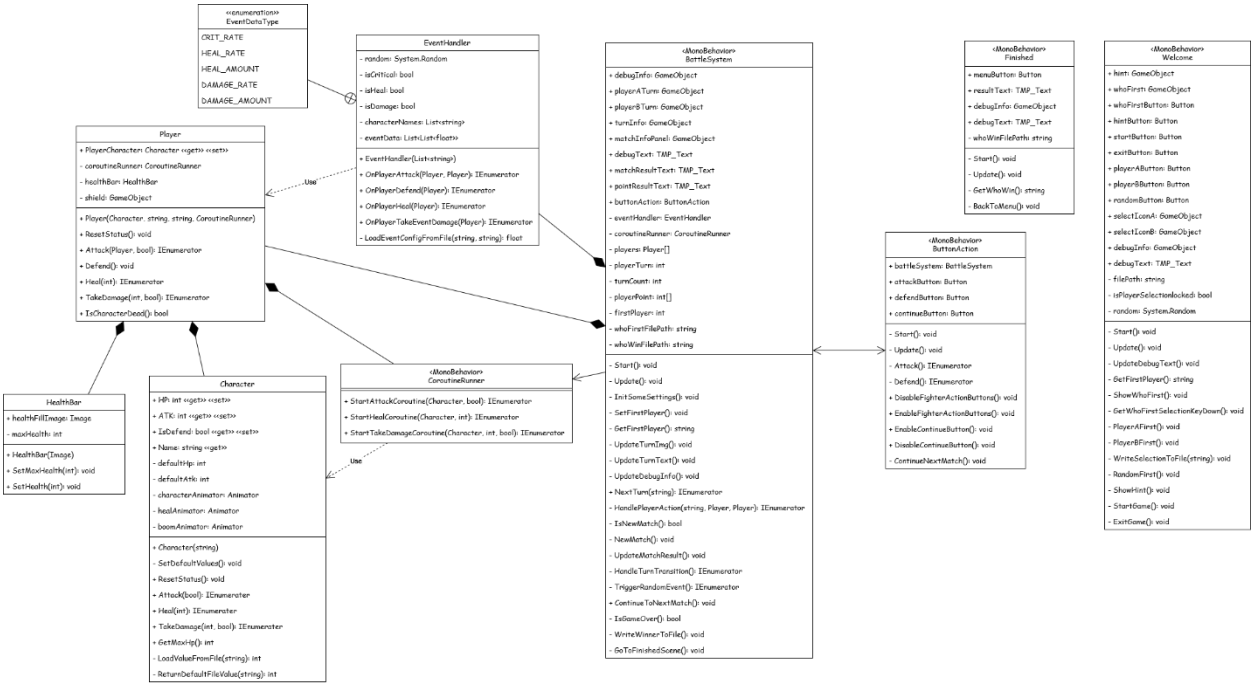
Flowchart


Welcome
New Game
New Match
New Turn
Who Action First
Player A First
Player B First
Player A Trigger Random Event
Player B Trigger Random Event
Player A Action
Player B Action
Yes
if Player B HP <= 0
No
if Player A HP <= 0
Yes
No
Player B Trigger Random Event
Player A Trigger Random Event
Player B Action
Player A Action
Turn End
No
if one player hp < 0 or 10 truns
Yes
Match End
No
If one player Wins two more matches than the other player (not contain Draw)
Yes
Game Finished

Class Diagram

如想看放大圖片可至

https://raw.githubusercontent.com/kyynk/RPG_mid/refs/heads/main/DocumentAndGraph/SomeGraph/class_diagram.png



Source Code

Welcome.cs

```
using TMPro;
using System.IO;
using UnityEngine;
using UnityEngine.UI;
using UnityEngine.SceneManagement;

namespace RPGBattle
{
   public class Welcome : MonoBehaviour
   {
      public GameObject hint;
      public GameObject whoFirst;
      public Button whoFirstButton;
      public Button hintButton;
      public Button startButton;
      public Button exitButton;
      public Button playerAButton;
      public Button playerBButton;
      public Button randomButton;
      public GameObject selectIconA;
      public GameObject selectIconB;
      public GameObject debugInfo;
      public TMP_Text debugText;

      private string filePath;
      private bool isPlayerSelectionlocked;
      private System.Random random;

      void Start()
      {
         filePath = Path.Combine(Application.streamingAssetsPath,
"who_first.txt"); // Set file path
         random = new System.Random();

         whoFirstButton.onClick.AddListener(ShowWhoFirst);
         hintButton.onClick.AddListener(ShowHint);
         startButton.onClick.AddListener(StartGame);
```

```
        exitButton.onClick.AddListener(ExitGame);

        playerAButton.onClick.AddListener(PlayerAFirst);
        playerBButton.onClick.AddListener(PlayerBFirst);
        randomButton.onClick.AddListener(RandomFirst);
        PlayerAFirst();
        isPlayerSelectionlocked = true;
        hint.SetActive(false);
        whoFirst.SetActive(false);
        debugInfo.SetActive(false);
    }

    // Update is called once per frame
    void Update()
    {
        if (Input.GetKeyDown("w"))
        {
            ShowWhoFirst();
        }
        else if (Input.GetKeyDown("h"))
        {
            ShowHint();
        }
        else if (Input.GetKeyDown("s"))
        {
            StartGame();
        }
        else if (Input.GetKeyDown("e"))
        {
            ExitGame();
        }
        else if (Input.GetKeyDown(KeyCode.Tab))
        {
            if (debugInfo.activeSelf)
            {
                debugInfo.SetActive(false);
            }
            else
            {
                debugInfo.SetActive(true);
```

```
        }
    }
    else if (!isPlayerSelectionlocked)
    {
        GetWhoFirstSelectionKeyDown();
    }
    UpdateDebugText();
}

private void UpdateDebugText()
{
    debugText.text = "State: Welcome\n" +
                     "Who First:\n" +
                     GetFirstPlayer();
}

private string GetFirstPlayer()
{
    if (File.Exists(filePath))
    {
        return File.ReadAllText(filePath);
    }
    else
    {
        Debug.LogError("File not found!");
        return "Player A";
    }
}

private void ShowWhoFirst()
{
    hint.SetActive(false);
    whoFirst.SetActive(true);
    isPlayerSelectionlocked = false;
}

private void GetWhoFirstSelectionKeyDown()
{
    if (Input.GetKeyDown("a"))
    {
```

```
            PlayerAFirst();
        }
        else if (Input.GetKeyDown("b"))
        {
            PlayerBFirst();
        }
        else if (Input.GetKeyDown("r"))
        {
            RandomFirst();
        }
    }

    private void PlayerAFirst()
    {
        selectIconA.SetActive(true);
        selectIconB.SetActive(false);
        WriteSelectionToFile("Player A");
    }

    private void PlayerBFirst()
    {
        selectIconA.SetActive(false);
        selectIconB.SetActive(true);
        WriteSelectionToFile("Player B");
    }

    private void WriteSelectionToFile(string selection)
    {
        try
        {
            File.WriteAllText(filePath, selection);
        }
        catch (IOException ex)
        {
            Debug.LogError($"Failed to write to file: {ex.Message}");
        }
    }

    private void RandomFirst()
    {
```

```
            if (random.Next(0, 2) == 0)
            {
                PlayerAFirst();
            }
            else
            {
                PlayerBFirst();
            }
        }

        private void ShowHint()
        {
            hint.SetActive(true);
            whoFirst.SetActive(false);
            isPlayerSelectionlocked = true;
        }

        private void StartGame()
        {
            SceneManager.LoadScene("BattleScene");
        }

        private void ExitGame()
        {
            Application.Quit();
        }
    }
}
```

BattleSystem.cs

```
using TMPro;
using System;
using System.IO;
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.SceneManagement;

namespace RPGBattle
{
    public class BattleSystem : MonoBehaviour
    {
        // UI references
        public GameObject debugInfo;
        public GameObject playerATurn;
        public GameObject playerBTurn;
        public GameObject turnInfo;
        public GameObject matchInfoPanel; // MatchInfo panel
        public TMP_Text debugText;
        public TMP_Text matchResultText; // Match result text
        public TMP_Text pointResultText; // Point result text
        public ButtonAction buttonAction;

        private EventHandler eventHandler;
        private CoroutineRunner coroutineRunner;
        private Player[] players;
        private int playerTurn; // 0 or 1 (player 1 or player 2)
        private int turnCount;
        private int[] playerPoint;
        private int firstPlayer;
        private string whoFirstFilePath;
        private string whoWinFilePath;

        private void Start()
        {
            GameObject runnerObject = new GameObject("CoroutineRunner");
            coroutineRunner = runnerObject.AddComponent<CoroutineRunner>();
            eventHandler = new EventHandler(new List<string> { "Giant",
"Paladin" });
```

```
        players = new Player[2];
        players[0] = new Player(new Character("Giant"), "L_HP", "L_Shield",
coroutineRunner);
        players[1] = new Player(new Character("Paladin"), "R_HP", "R_Shield",
coroutineRunner);
        playerPoint = new int[2] { 0, 0 };
        whoFirstFilePath = Path.Combine(Application.streamingAssetsPath,
"who_first.txt");
        whoWinFilePath = Path.Combine(Application.streamingAssetsPath,
"who_win.txt");
        debugInfo.SetActive(false);
        InitSomeSettings();
    }

    private void Update()
    {
        if (Input.GetKeyDown(KeyCode.Tab))
        {
            if (debugInfo.activeSelf)
            {
                debugInfo.SetActive(false);
            }
            else
            {
                debugInfo.SetActive(true);
                UpdateDebugInfo();
            }
        }
    }

    private void InitSomeSettings()
    {
        turnCount = 1;
        SetFirstPlayer();
        matchInfoPanel.SetActive(false);
        turnInfo.SetActive(true);
        foreach (Player player in players)
        {
            player.ResetStatus();
        }
```

```
        UpdateTurnText();
        UpdateDebugInfo();
    }

    private void SetFirstPlayer()
    {
        string firstPlayerName = GetFirstPlayer();
        if (firstPlayerName == "Player A")
        {
            firstPlayer = 0;
            playerTurn = 0;
        }
        else
        {
            firstPlayer = 1;
            playerTurn = 1;
        }
        UpdateTurnImg();
    }

    private string GetFirstPlayer()
    {
        if (File.Exists(whoFirstFilePath))
        {
            return File.ReadAllText(whoFirstFilePath);
        }
        else
        {
            Debug.LogError("File not found!");
            return "Player A";
        }
    }

    private void UpdateTurnImg()
    {
        if (playerTurn == 0)
        {
            playerATurn.SetActive(true);
            playerBTurn.SetActive(false);
        }
```

```
            else
            {
                playerATurn.SetActive(false);
                playerBTurn.SetActive(true);
            }
        }

        private void UpdateTurnText()
        {
            TMP_Text turnInfoText = turnInfo.GetComponent<TMP_Text>();
            if (turnInfoText != null)
            {
                turnInfoText.text = "Round " + turnCount;
            }
            else
            {
                Debug.LogError("Text component is missing on TurnText
GameObject!");
            }
        }

        private void UpdateDebugInfo()
        {
            debugText.text = "State: " + (playerTurn == 0 ? "Player A" : "Player B")
+ "\n" +
                             "Player A: \nHP=" + players[0].PlayerCharacter.HP +
                             ", ATK=" + players[0].PlayerCharacter.ATK +
                             ", DEFEND=" + (players[0].PlayerCharacter.IsDefend ?
"true" : "false") + "\n" +
                             "Player B: \nHP=" + players[1].PlayerCharacter.HP +
                             ", ATK=" + players[1].PlayerCharacter.ATK +
                             ", DEFEND=" + (players[1].PlayerCharacter.IsDefend ?
"true" : "false");
        }

        public IEnumerator NextTurn(string action)
        {
            // every turn need two players to attack each other, so we need to get the
current player and the opponent
            Player currentPlayer = players[playerTurn];
```

```
            Player opponent = players[(playerTurn + 1) % 2];
            buttonAction.DisableFighterActionButtons();
            yield return HandlePlayerAction(action, currentPlayer, opponent);
            if (firstPlayer != playerTurn)
            {
                turnCount++;
            }
            UpdateDebugInfo(); // update debug info for player property
            if (IsNewMatch())
            {
                NewMatch();
            }
            else
            {
                yield return HandleTurnTransition();
            }
        }

        private IEnumerator HandlePlayerAction(string action, Player
currentPlayer, Player opponent)
        {
            if (action == "attack")
            {
                yield return eventHandler.OnPlayerAttack(currentPlayer, opponent);
            }
            else if (action == "defend")
            {
                yield return eventHandler.OnPlayerDefend(currentPlayer);
            }
            else
            {
                Debug.LogError("Invalid action!");
            }
        }

        private bool IsNewMatch()
        {
            // if 10 turn or one player hp <= 0, then the match is over
            return turnCount > 10 || players[0].IsCharacterDead() ||
players[1].IsCharacterDead();
```

```
    }

    private void NewMatch()
    {
        UpdateMatchResult();
        matchInfoPanel.SetActive(true);
        turnInfo.SetActive(false);
        buttonAction.DisableFighterActionButtons();
        buttonAction.EnableContinueButton();
    }

    private void UpdateMatchResult()
    {
        // has results: p1 win, p2 win, draw
        if (players[1].IsCharacterDead())
        {
            matchResultText.text = "Player A Win";
            playerPoint[0]++;
        }
        else if (players[0].IsCharacterDead())
        {
            matchResultText.text = "Player B Win";
            playerPoint[1]++;
        }
        else
        {
            matchResultText.text = "Draw";
        }
        pointResultText.text = playerPoint[0] + " - " + playerPoint[1];
    }

    private IEnumerator HandleTurnTransition()
    {
        UpdateTurnText();
        playerTurn = (playerTurn + 1) % 2;
        UpdateTurnImg();
        UpdateDebugInfo(); // update debug info for state
        yield return TriggerRandomEvent();
        if (IsNewMatch()) // since maybe the random event cause the match over
        {
```

```
            NewMatch();
        }
        else
        {
            buttonAction.EnableFighterActionButtons();
        }
    }

    private IEnumerator TriggerRandomEvent()
    {
        Player currentPlayer = players[playerTurn];
        yield return eventHandler.OnPlayerHeal(currentPlayer);
        UpdateDebugInfo(); // update debug info for player property (hp)
        yield return eventHandler.OnPlayerTakeEventDamage(currentPlayer);
        UpdateDebugInfo(); // update debug info for player property (hp)
    }

    public void ContinueToNextMatch()
    {
        buttonAction.EnableFighterActionButtons(); // Re-enable buttons
        buttonAction.DisableContinueButton(); // Hide Continue button
        if (IsGameOver())
        {
            WriteWinnerToFile();
            GoToFinishedScene();
        }
        else
        {
            InitSomeSettings();
        }
    }

    private bool IsGameOver()
    {
        return Math.Abs(playerPoint[0] - playerPoint[1]) == 2;
    }

    private void WriteWinnerToFile()
    {
        try
```

```
            {
                string winner = playerPoint[0] > playerPoint[1] ? "Player A" : "Player
B";
                File.WriteAllText(whoWinFilePath, winner);
            }
            catch (IOException ex)
            {
                Debug.LogError($"Failed to write to file: {ex.Message}");
            }
        }

        private void GoToFinishedScene()
        {
            SceneManager.LoadScene("FinishedScene");
        }
    }
}
```

Finished.cs

```
using TMPro;
using System.IO;
using UnityEngine;
using UnityEngine.UI;
using UnityEngine.SceneManagement;

public class Finished : MonoBehaviour
{
    public Button menuButton;
    public TMP_Text resultText;
    public GameObject debugInfo;
    public TMP_Text debugText;

    private string whoWinFilePath;

    // Start is called before the first frame update
    void Start()
    {
        whoWinFilePath = Path.Combine(Application.streamingAssetsPath,
"who_win.txt");
        menuButton.onClick.AddListener(BackToMenu);
        debugInfo.SetActive(false);

        resultText.text = GetWhoWin() + "!!!";
        debugText.text = "State: Finished\n" +
                    "Winner:" + GetWhoWin();
    }

    // Update is called once per frame
    void Update()
    {
        if (Input.GetKeyDown(KeyCode.Tab))
        {
            if (debugInfo.activeSelf)
            {
                debugInfo.SetActive(false);
            }
            else
            {
```

```
                debugInfo.SetActive(true);
            }
        }
        else if (Input.GetKeyDown("m"))
        {
            BackToMenu();
        }
    }

    private string GetWhoWin()
    {
        if (!File.Exists(whoWinFilePath))
        {
            return "File Not Found";
        }
        return File.ReadAllText(whoWinFilePath);
    }

    private void BackToMenu()
    {
        SceneManager.LoadScene("WelcomeScene");
    }
}
```

ButtonAction.cs

```
using System.Collections;
using UnityEngine;
using UnityEngine.UI;

namespace RPGBattle
{
   public class ButtonAction : MonoBehaviour
   {
      public BattleSystem battleSystem;
      public Button attackButton;
      public Button defendButton;
      public Button continueButton;

      void Start()
      {
         // Add listener for mouse clicks
         attackButton.onClick.AddListener(() => StartCoroutine(Attack()));
         defendButton.onClick.AddListener(() => StartCoroutine(Defend()));
         continueButton.onClick.AddListener(ContinueNextMatch);

         // Initially disable ContinueButton
         continueButton.gameObject.SetActive(false);
      }

      // Update is called once per frame
      void Update()
      {
         if (attackButton.interactable && defendButton.interactable)
         {
            if (Input.GetKeyDown("a"))
            {
               StartCoroutine(Attack());
            }
            else if (Input.GetKeyDown("d"))
            {
               StartCoroutine(Defend());
            }
         }
         else if (Input.GetKeyDown("c"))
```

```
        {
            ContinueNextMatch();
        }
    }

    private IEnumerator Attack()
    {
        yield return battleSystem.NextTurn("attack");
    }

    private IEnumerator Defend()
    {
        yield return battleSystem.NextTurn("defend");
    }

    public void DisableFighterActionButtons()
    {
        attackButton.interactable = false;
        defendButton.interactable = false;
    }

    public void EnableFighterActionButtons()
    {
        attackButton.interactable = true;
        defendButton.interactable = true;
    }

    public void EnableContinueButton()
    {
        continueButton.gameObject.SetActive(true); // Show Continue button
    }

    public void DisableContinueButton()
    {
        continueButton.gameObject.SetActive(false); // Hide Continue button
    }

    private void ContinueNextMatch()
    {
        battleSystem.ContinueToNextMatch();
```

```
        }
    }
}
```

Character.cs

```
using System;
using System.IO;
using System.Collections;
using UnityEngine;

namespace RPGBattle
{
   public class Character
   {
      public int HP { get; set; }
      public int ATK { get; set; }
      public bool IsDefend { get; set; }

      public string Name { get; }

      private int defaultHp;
      private int defaultAtk;
      private Animator characterAnimator;
      private Animator healAnimator;
      private Animator boomAnimator;

      public Character(string _name)
      {
         Name = _name;
         GameObject gameObject =
GameObject.FindGameObjectWithTag(Name);
         if (gameObject == null)
         {
            Debug.LogError($"GameObject for {Name} not found!");
         }
         characterAnimator = gameObject.GetComponent<Animator>();
         gameObject = GameObject.FindGameObjectWithTag(Name + "Heal");
         if (gameObject == null)
         {
            Debug.LogError($"GameObject for {Name}Heal not found!");
         }
         healAnimator = gameObject.GetComponent<Animator>();
         gameObject = GameObject.FindGameObjectWithTag(Name + "Boom");
         if (gameObject == null)
```

```
        {
            Debug.LogError($"GameObject for {Name}Boom not found!");
        }
        boomAnimator = gameObject.GetComponent<Animator>();
        SetDefaultValues();
        ResetStatus();
    }

    private void SetDefaultValues()
    {
        defaultHp = LoadValueFromFile("hp");
        defaultAtk = LoadValueFromFile("atk");
    }

    public void ResetStatus()
    {
        HP = defaultHp;
        ATK = defaultAtk;
        IsDefend = false;
        characterAnimator.Play("idle");
        healAnimator.Play("hidden");
        boomAnimator.Play("hidden");
    }

    public IEnumerator Attack(bool isCritical)
    {
        if (isCritical)
        {
            characterAnimator.Play("crit_attack");
        }
        else
        {
            characterAnimator.Play("attack");
        }
        yield return new
WaitForSeconds(characterAnimator.GetCurrentAnimatorStateInfo(0).length);
    }

    public IEnumerator Heal(int amount)
    {
```

```
        healAnimator.Play("heal");
        HP += amount;
        yield return new
WaitForSeconds(healAnimator.GetCurrentAnimatorStateInfo(0).length);
    }

    public IEnumerator TakeDamage(int amount, bool isEventDamage)
    {
        if (isEventDamage)
        {
            boomAnimator.Play("boom");
            yield return new
WaitForSeconds(boomAnimator.GetCurrentAnimatorStateInfo(0).length);
        }

        if (IsDefend)
        {
            HP -= amount / 2;
            IsDefend = false;
        }
        else
        {
            HP -= amount;
        }

        characterAnimator.Play("injure");
        yield return new
WaitForSeconds(characterAnimator.GetCurrentAnimatorStateInfo(0).length);
    }

    public int GetMaxHp()
    {
        return defaultHp;
    }

    private int LoadValueFromFile(string fileName)
    {
        string filePath = Path.Combine(Application.streamingAssetsPath,
"PlayerConfig", fileName + ".csv");
```

```
        if (!File.Exists(filePath))
        {
            Debug.LogError($"File {fileName} not found!");
            return ReturnDefaultFileValue(fileName);
        }

        try
        {
            string[] lines = File.ReadAllLines(filePath);  // Reads all lines from the
file
            foreach (string line in lines)
            {
                string[] values = line.Split(',');
                // Check if the name matches the first column
                if (values.Length > 1 && values[0] == Name)
                {
                    if (int.TryParse(values[1], out int targetValue))
                    {
                        return targetValue;  // Return parsed value for HP or ATK
                    }
                }
            }
        }
        catch (Exception ex)
        {
            Debug.LogError($"Error reading {fileName}.csv: {ex.Message}");
        }

        Debug.LogWarning($"Value for {Name} not found in {fileName}.csv.
Using default value.");
        return ReturnDefaultFileValue(fileName);
    }

    private int ReturnDefaultFileValue(string type)
    {
        return type == "atk" ? 10 : 100;
    }
  }
}
```

CoroutineRunner.cs

```
using System.Collections;
using UnityEngine;

namespace RPGBattle
{
   public class CoroutineRunner : MonoBehaviour
   {
      public IEnumerator StartAttackCoroutine(Character character, bool
isCritical)
      {
         yield return StartCoroutine(character.Attack(isCritical));
      }

      public IEnumerator StartHealCoroutine(Character character, int amount)
      {
         yield return StartCoroutine(character.Heal(amount));
      }

      public IEnumerator StartTakeDamageCoroutine(Character character, int
amount, bool isEventDamage)
      {
         yield return StartCoroutine(character.TakeDamage(amount,
isEventDamage));
      }
   }
}
```

EventHandler.cs

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

namespace RPGBattle
{
   public class EventHandler
   {
      private enum EventDataType
      {
         CRIT_RATE,
         HEAL_RATE,
         HEAL_AMOUNT,
         DAMAGE_RATE,
         DAMAGE_AMOUNT
      }

      private System.Random random; // using System.Random, since Unity's
Random not random enough
      private bool isCritical;
      private bool isHeal;
      private bool isDamage;
      private List<string> characterNames;
      private List<List<float>> eventData;

      public EventHandler(List<string> _characterNames)
      {
         random = new System.Random();
         isCritical = false;
         isHeal = false;
         isDamage = false;
         eventData = new List<List<float>>();
         characterNames = new List<string>(_characterNames);
         foreach (var name in characterNames)
         {
            eventData.Add(new List<float>
            {
```

```
                LoadEventConfigFromFile("crit_rate", name),
                LoadEventConfigFromFile("heal_rate", name),
                LoadEventConfigFromFile("heal_amount", name),
                LoadEventConfigFromFile("damage_rate", name),
                LoadEventConfigFromFile("damage_amount", name)
            });
        }
    }

    public IEnumerator OnPlayerAttack(Player player, Player enemy)
    {
        int whichPlayer = characterNames.FindIndex(x => x ==
player.PlayerCharacter.Name);
        isCritical = random.NextDouble() <
eventData[whichPlayer][EventDataType.CRIT_RATE.GetHashCode()];
        yield return player.Attack(enemy, isCritical);
    }

    public IEnumerator OnPlayerDefend(Player player)
    {
        player.Defend();
        yield return null;
    }

    /// <summary>
    /// random event for player to heal
    /// </summary>
    /// <param name="player"></param>
    public IEnumerator OnPlayerHeal(Player player)
    {
        int whichPlayer = characterNames.FindIndex(x => x ==
player.PlayerCharacter.Name);
        isHeal = random.NextDouble() <
eventData[whichPlayer][EventDataType.HEAL_RATE.GetHashCode()];
        if (isHeal)
        {
            yield return
player.Heal((int)eventData[whichPlayer][EventDataType.HEAL_AMOUNT.Get
HashCode()]);
        }
```

```
    }

    /// <summary>
    /// random event for player to take damage
    /// </summary>
    /// <param name="player"></param>
    public IEnumerator OnPlayerTakeEventDamage(Player player)
    {
        int whichPlayer = characterNames.FindIndex(x => x ==
player.PlayerCharacter.Name);
        isDamage = random.NextDouble() <
eventData[whichPlayer][EventDataType.DAMAGE_RATE.GetHashCode()];
        if (isDamage)
        {
            yield return
player.TakeDamage((int)eventData[whichPlayer][EventDataType.DAMAGE_A
MOUNT.GetHashCode()], true);
        }
    }

    private float LoadEventConfigFromFile(string fileName, string
characterName)
    {
        string filePath = Path.Combine(Application.streamingAssetsPath,
"EventConfig", fileName + ".csv");

        if (!File.Exists(filePath))
        {
            Debug.LogError($"File {fileName} not found!");
            return 0;
        }
        try
        {
            string[] lines = File.ReadAllLines(filePath);  // Reads all lines from the
file
            foreach (string line in lines)
            {
                string[] values = line.Split(',');
                // Check if the name matches the first column
                if (values.Length > 1 && values[0] == characterName)
```

```
                {
                    if (float.TryParse(values[1], out float targetValue))
                    {
                        return targetValue;  // Return parsed value for HP or ATK
                    }
                }
            }
        }
        catch (Exception ex)
        {
            Debug.LogError($"Error reading {fileName}.csv: {ex.Message}");
        }
        Debug.LogWarning($"Value for {characterName} not found in
{fileName}.csv");
        return 0;
    }
  }
}
```

HealthBar.cs

```
using UnityEngine.UI;

namespace RPGBattle
{
    public class HealthBar
    {
        public Image healthFillImage; // Reference to the health bar Image

        private int maxHealth;

        public HealthBar(Image _healthFillImage)
        {
            healthFillImage = _healthFillImage;
        }

        public void SetMaxHealth(int maxHealth)
        {
            this.maxHealth = maxHealth;
            healthFillImage.fillAmount = 1f; // Set to full at the start
        }

        public void SetHealth(int currentHealth)
        {
            healthFillImage.fillAmount = (float)currentHealth / maxHealth;
        }
    }
}
```

Player.cs

```
using System.Collections;
using UnityEngine;

namespace RPGBattle
{
   public class Player
   {
      public Character PlayerCharacter { get; set; }
      private CoroutineRunner coroutineRunner;
      private HealthBar healthBar;
      private GameObject shield;

      public Player(Character _character, string _healthBarTag, string _shieldTag,
CoroutineRunner _coroutineRunner)
      {
         PlayerCharacter = _character;
         GameObject healthBarImg =
GameObject.FindGameObjectWithTag(_healthBarTag);
         if (healthBarImg == null)
         {
            Debug.LogError($"Health bar image for {_healthBarTag} not
found!");
         }
         GameObject shieldObject =
GameObject.FindGameObjectWithTag(_shieldTag);
         if (shieldObject == null)
         {
            Debug.LogError($"Defend image for {_shieldTag} not found!");
         }
         shield = shieldObject;
         shield.SetActive(PlayerCharacter.IsDefend);
         healthBar = new
HealthBar(healthBarImg.GetComponent<UnityEngine.UI.Image>());
         healthBar.SetMaxHealth(PlayerCharacter.GetMaxHp());
         coroutineRunner = _coroutineRunner;
      }

      public void ResetStatus()
      {
```

```
            PlayerCharacter.ResetStatus();
            healthBar.SetHealth(PlayerCharacter.HP);
            shield.SetActive(PlayerCharacter.IsDefend);
        }

        public IEnumerator Attack(Player enemy, bool isCritical)
        {
            yield return coroutineRunner.StartAttackCoroutine(PlayerCharacter,
isCritical);
            int damage = isCritical ? PlayerCharacter.ATK * 2 :
PlayerCharacter.ATK;
            yield return enemy.TakeDamage(damage, false);
        }

        public void Defend()
        {
            PlayerCharacter.IsDefend = true;
            shield.SetActive(PlayerCharacter.IsDefend);
        }

        public IEnumerator Heal(int amount)
        {
            yield return coroutineRunner.StartHealCoroutine(PlayerCharacter,
amount);
            if (PlayerCharacter.HP > PlayerCharacter.GetMaxHp())
            {
                PlayerCharacter.HP = PlayerCharacter.GetMaxHp();
            }
            healthBar.SetHealth(PlayerCharacter.HP);
        }

        public IEnumerator TakeDamage(int amount, bool isEventDamage)
        {
            yield return
coroutineRunner.StartTakeDamageCoroutine(PlayerCharacter, amount,
isEventDamage);
            shield.SetActive(PlayerCharacter.IsDefend);
            if (PlayerCharacter.HP < 0)
            {
                PlayerCharacter.HP = 0;
```

```
            }
            healthBar.SetHealth(PlayerCharacter.HP);
        }

        public bool IsCharacterDead()
        {
            return PlayerCharacter.HP <= 0;
        }
    }
}
```