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/// <summary>
/// Regenerates player health based on distance from "home"
/// </summary>
private void HandleHealing()
{
    if (mainHome == null) return;

    float distanceFromHome = Vector2.Distance(mainHome.transform.position,
transform.position);
    float healAmount = Mathf.Lerp(maxHeal, minHeal, distanceFromHome / maxDistance);
    healAmount = Mathf.Clamp(healAmount, minHeal, maxHeal);

    if (currentHP < maxHP)
    {
        currentHP += healAmount * Time.deltaTime;
        currentHP = Mathf.Min(currentHP, maxHP);
    }
}

/// <summary>
/// Controls the freeze effect (changes color and timer)
/// </summary>
private void HandleFreezeEffect()
{
    if (freezeTimer <= 0)
    {
        Color newColor = animatorPlayerScript.sp.color;
        newColor.r = 1f; // normal color
        animatorPlayerScript.sp.color = newColor;
    }
    else
    {
        freezeTimer -= Time.deltaTime;
    }
}

/// <summary>
/// Sets attack type in animator (for animations)
/// </summary>
private void HandleAttackType()
{
    animatorPlayerScript.animator.SetInteger("typeAttack", typeAttack);
}

/// <summary>
/// Reads input for movement direction and sets movement vector
/// </summary>
private void HandleMovementInput()
{
    if (cooldownTimer > 0)
    {
        cooldownTimer -= Time.deltaTime;
        movement = Vector2.zero;
        return;
    }

    float moveX = 0f;
    float moveY = 0f;

    if (Input.GetKey(KeyCode.W)) moveY += 1f;
    if (Input.GetKey(KeyCode.S)) moveY -= 1f;
    if (Input.GetKey(KeyCode.D)) moveX += 1f;
    if (Input.GetKey(KeyCode.A)) moveX -= 1f;

    movement = new Vector2(moveX, moveY).normalized;
}

/// <summary>
/// Moves the player physically using Rigidbody2D
/// </summary>
private void MovePlayer()
{
    Vector2 newPosition = rb.position + movement * speed * Time.fixedDeltaTime;
    rb.MovePosition(newPosition);
}

/// <summary>
/// Applies damage to the player and handles freeze effect if applicable
/// </summary>
public void TakeDamage(int dmg, bool freeze)
{
    if (!playerAttackScript.attack)
    {
        currentHP -= dmg * Time.deltaTime;
        cameraDMG.SetTrigger("takeDMG");
        cooldownTimer = cooldown;
    }
    else
    {
        Debug.Log("Shield active, no damage taken");
    }

    if (freeze)
    {
        ApplyFreezeEffect();
    }
}

/// <summary>
/// Applies freeze effect (changes color and plays sound)
/// </summary>
private void ApplyFreezeEffect()
{
    Color newColor = animatorPlayerScript.sp.color;
    newColor.r = 0f;
    animatorPlayerScript.sp.color = newColor;

    freezeTimer = Random.Range(freezeCooldown * 0.6f, freezeCooldown);

    GameObject effect = Instantiate(soundEffectFreezPrefab);
    Destroy(effect, 2f);
}

/// <summary>
/// Detects when player enters triggers and applies relevant effects
/// </summary>
private void OnTriggerEnter2D(Collider2D other)
{
    switch (other.gameObject.tag)
    {
        case "green_cristals":
            mainUI.IncreaseCrystalGreen(1);
            PlayCrystalEffect(other.gameObject);
            break;
        case "fire_cristals":
            mainUI.IncreaseCrystalFire(1);
            PlayCrystalEffect(other.gameObject);
            break;
        case "ice_cristals":
            mainUI.IncreaseCrystalIce(1);
            PlayCrystalEffect(other.gameObject);
            break;
        case "gold_cristals":
            mainUI.IncreaseCrystalGold(1);
            PlayCrystalEffect(other.gameObject);
            break;
        case "tarc":
            nearSlimePen = true;
            break;
    }
}

/// <summary>
/// Plays crystal collection effect and destroys the crystal object
/// </summary>
private void PlayCrystalEffect(GameObject crystal)
{
    Destroy(crystal);
    GameObject effect = Instantiate(soundEffectCristalsPrefab);
    Destroy(effect, 2f);
}

/// <summary>
/// Detects when player exits the "tarc" trigger
/// </summary>
private void OnTriggerExit2D(Collider2D other)
{
    if (other.CompareTag("tarc"))
    {
        nearSlimePen = false;
    }
}

/// <summary>
/// Updates reference to the closest GameObject with tag "slime_pen"
/// </summary>
private void UpdateClosestSlimePen()
{
    closestSlimePen = GetClosestObjectWithTag("slime_pen");
}

/// <summary>
/// Finds the closest GameObject with the specified tag
/// </summary>
public GameObject GetClosestObjectWithTag(string tag)
{
    GameObject[] objects = GameObject.FindGameObjectsWithTag(tag);

    GameObject closest = null;
    float minDistance = Mathf.Infinity;
    Vector3 playerPos = transform.position;

    foreach (var obj in objects)
    {
        float dist = Vector3.Distance(playerPos, obj.transform.position);
        if (dist < minDistance)
        {
            minDistance = dist;
            closest = obj;
        }
    }
    return closest;
}

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