

Game Programming

Lecture VII Speed Boost

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Create the Speed Boost Prefab

- Drag the first speed sprite from powerups folder to the Hierarchy window
- Change the sorting layer to foreground
- Rename it: "Speed_Powerup"
- Set scale to 0.5 0.5 0.5
- Add a Box Collider 2D
 - Set isTrigger true
- Add a Rigid Body 2D
 - Set gravity scale to 0
- Do we need a separate script for speed boost powerup?
 - Create a modular powerup script for all powerups
 - Add "Powerup_sc" component
- Make it a prefab
 - Delete it from the Hierarchy

Speed Boost Behavior

- Currently it behaves like the triple shot powerup
- How can we modularize the powerup?
 - Uniquely identify powerups
- Create an integer id system for powerups
 - 0 for Triple Shot
 - 1 for Speed
 - 2 for Shield
- Define an integer id variable
 - Set ids accordingly from the Hierarchy window for each powerup prefab

```
[SerializeField]
```

```
0 references
```

```
private int powerupID;
```

Speed Boost Behavior

- Apply powerup based on the id of the collected powerup item

```
if (player != null)
{
    switch(powerupID)
    {
        case 0:
            player.TripleShotActive();
            break;
        case 1:
            Debug.Log("Collected Speed Powerup");
            break;
        case 2:
            Debug.Log("Collected Shield Powerup");
            break;
        default:
            Debug.Log("Default Value");
            break;
    }
}
```

Speed Boost Implementation

- Define a speed multiplier variable in the “Player” script
 - Speed will be multiplied with this value when the speed boost is activated

```
[SerializeField]  
1 reference  
private float _speed = 3.5f;  
0 references  
private float _speedMultiplier = 2;
```

- Define a Boolean variable to check if the speed boost is activated

```
private bool _isTripleShotActive = false;  
0 references  
private bool _isSpeedBoostActive = false;
```

Speed Boost Implementation

- Define a public function to activate speed boost
 - Increase speed

```
public void SpeedBoostActive()  
{  
    _isSpeedBoostActive = true;  
    _speed *= _speedMultiplier;  
    StartCoroutine(SpeedBoostPowerDownRoutine());  
}
```

- Define a power down routine to disable speed boost after 5 seconds
 - Decrease speed

```
IEnumerator SpeedBoostPowerDownRoutine()  
{  
    yield return new WaitForSeconds(5.0f);  
    _isSpeedBoostActive = false;  
    _speed /= _speedMultiplier;  
}
```

Speed Boost Implementation

- Update "Powerup_sc" to call speed boost activation function

```
if (player != null)
{
    switch(powerupID)
    {
        case 0:
            player.TripleShotActive();
            break;
        case 1:
            player.SpeedBoostActive();
            break;
        case 2:
            Debug.Log("Collected Shield Powerup");
            break;
        default:
            Debug.Log("Default Value");
            break;
    }
}
```

Spawn Speed Boost Powerup

- Modify Spawn Manager to include the Speed Boost Powerup
- Modularize the variable that we have defined for the Triple Shot Powerup prefab earlier
 - Make it an array of powerups
 - Disable Instantiate function in the SpawnPowerupRoutine temporarily

```
private GameObject[] _powerupPrefabs;
```

- In the Hierarchy Window, change size of powerupPrefabs to 3
 - Add elements for each powerup prefab in order according to ids defined earlier

Spawn Speed Boost Powerup

- Update “SpawnPowerupRoutine”
 - Select the powerup randomly (among two powerups for now)
 - Instantiate the powerup game object from the prefabs array based on the randomly selected powerup id

```
IEnumerator SpawnPowerupRoutine()
{
    while (_stopSpawning == false)
    {
        Vector3 position = new Vector3(Random.Range(-8f, 8f), 7, 0);
        int randomPowerUp = Random.Range(0, 2);
        Instantiate(_powerupPrefabs[randomPowerUp], position, Quaternion.identity);
        yield return new WaitForSeconds(Random.Range(3,8));
    }
}
```

Animate Speed Boost

- Drag the Speed Powerup prefab to Hierarchy Window
- Make sure the Speed Powerup object is selected
- Open Window -> Animation -> Animation (or add tab -> Animation)
- Click Create and go to Animations folder
 - Save as Speed_Boost_anim
- Go to record mode
 - Drag and drop Speed sprites from Powerups folder to Animation Window
 - Disable record mode
- Override changes to prefab
- Delete the Speed Powerup object from the Hierarch Window