

C# Scripting in Unity: Script Optimization

INTRODUCTION



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Script Optimization



Concepts



Tools



Techniques



Premature Optimization



Premature Optimization

Premature optimization is spending a lot of time up front trying to address performance problems you haven't yet, or even worse, might never encounter.



When in doubt code for
readability.



Script Optimization



Code for readability



Profile



Optimize



There are multiple ways to
approach the code of
almost any behavior in
Unity.



```
private void Division()
{
    float y;

    for (int i = 1; i < 10000; i++)
    {
        y = i / 2;
    }
}
```

```
private void Multiplication()
{
    float y;

    for (int i = 1; i < 10000; i++)
    {
        y = i * 5f;
    }
}
```



Course Overview



Performance issues and code

The Unity Profiler

Optimization strategies

Object pooling



Coming Up



Performance Issues & Code



Causes for Poor Performance



Poorly structured code



Frequent or slow garbage collection



Use of expensive operations



Code that is simply too demanding



The performance demands
for every game are
different.



Script Optimization



Code for readability



Profile



Optimize



Defensive Optimization



Script Optimization



Defensively code for readability



Profile



Optimize



Coming Up



The Unity Profiler



Coming Up



Profiling Scripts



UnityScriptOptimization.zip



Coming Up



The Update Function



Every game is different



MonoBehaviour.Update()

Update is called every frame if the MonoBehaviour is enabled.

Update is the most commonly used function to implement any kind of game script. Not every MonoBehaviour script needs an update. ~ Unity



Eliminate calls to empty
Update functions.



Use alternatives to Update
when practical.



Coming Up



Improving Script Performance



Caching



Caching

Caching is simply storing a reference to an object or value for future use.



Use `sqrMagnitude` when
comparing distances.



Coming Up



Module Conclusion



Always cache references to
Camera.main.



Always cache a reference to
transform.



Things to Avoid



Searching for objects & components during updates



Expensive calls to Unity's API



Instantiating & destroying game objects during gameplay



Coming Up

