Marker-Based AR Game Using Unity and Vuforia – Step-by-Step Guide

# 🎯 Objective:

Create a basic AR app where pointing your camera at a specific image (marker) will play a video or track something in augmented reality.

# 🧰 Requirements:

## Software:

- Unity Hub and Unity Editor (preferably 2021.3 LTS or newer)  
- Vuforia Engine (for marker-based AR)  
- Vuforia Developer Account  
- Android SDK (for Android deployment) or Xcode (for iOS)  
- Webcam (for testing on PC) or Phone (for real-world testing)

# 🔧 Step 1: Install Unity and Vuforia

1. Download Unity Hub from https://unity.com.  
2. Inside Unity Hub:  
 - Click on "Installs" > Add.  
 - Choose Unity 2021.3.x LTS (or later).  
 - Make sure to check Android Build Support if targeting Android.  
3. Create a new project:  
 - Template: 3D  
 - Name: MarkerARGame

# 🧠 Step 2: Add Vuforia to Your Project

1. Go to Window > Package Manager.  
2. Click + > Add package from git URL, paste:  
 https://github.com/Vuforia/vuforia-unity-android-ios.git  
3. Let it install Vuforia.

# 🛠️ Step 3: Set Up Vuforia in Unity

1. Go to File > Build Settings > Player Settings.  
2. In XR Settings:  
 - Enable Vuforia Augmented Reality Support.  
3. Go to Assets > Create > Vuforia > ARCamera.  
 - This replaces the default Unity camera.

# 🏷️ Step 4: Create and Add a Marker (Image Target)

1. Go to https://developer.vuforia.com/, sign in, and:  
 - Create a new Target Database.  
 - Upload an image to use as a marker.  
 - Download the database for Unity.  
2. Import it into Unity:  
 - Assets > Import Package > Custom Package > Select the .unitypackage.

# 📹 Step 5: Add Image Target & Video

1. In Unity:  
 - Go to GameObject > Vuforia Engine > Image Target.  
 - Select your imported marker image.  
2. Add a video:  
 - Import the video file into Unity (.mp4 recommended).  
 - Drag and drop it onto the scene or create a Plane or Quad and apply a VideoPlayer component.

# 🧠 Step 6: C# Script to Play Video

1. Create a script:  
 - Right-click in Assets > Create > C# Script > Name it PlayVideoOnMarker

using UnityEngine;  
using UnityEngine.Video;  
using Vuforia;  
  
public class PlayVideoOnMarker : MonoBehaviour, ITrackableEventHandler  
{  
 private TrackableBehaviour mTrackableBehaviour;  
 public VideoPlayer videoPlayer;  
  
 void Start()  
 {  
 mTrackableBehaviour = GetComponent<TrackableBehaviour>();  
 if (mTrackableBehaviour)  
 {  
 mTrackableBehaviour.RegisterTrackableEventHandler(this);  
 }  
 }  
  
 public void OnTrackableStateChanged(TrackableBehaviour.Status previousStatus, TrackableBehaviour.Status newStatus)  
 {  
 if (newStatus == TrackableBehaviour.Status.DETECTED || newStatus == TrackableBehaviour.Status.TRACKED)  
 {  
 videoPlayer.Play();  
 }  
 else  
 {  
 videoPlayer.Pause();  
 }  
 }  
}

3. Attach this script to the ImageTarget object.  
4. Drag the VideoPlayer component from the object playing the video into the script field.

# 📱 Step 7: Build and Deploy to Phone

1. Go to File > Build Settings.  
2. Select Android or iOS and click Switch Platform.  
3. Connect your phone via USB and enable Developer Options > USB Debugging.  
4. Click Build and Run.

# 🧪 Step 8: Test!

Print your marker. Point the phone at it. The video should play when the image is detected!