


Tópicos Especiais em Engenharia de Software (Jogos II)

Aula 01 – Introdução à Unity 3D

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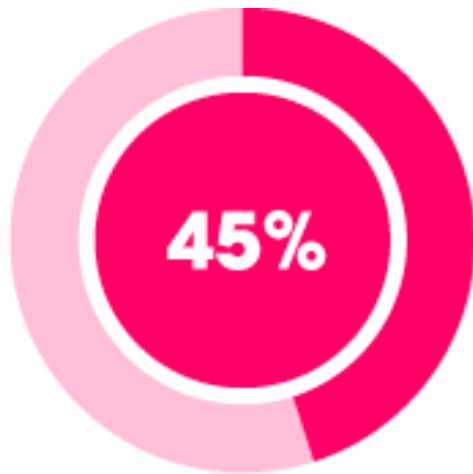


O que é a Unity3D?

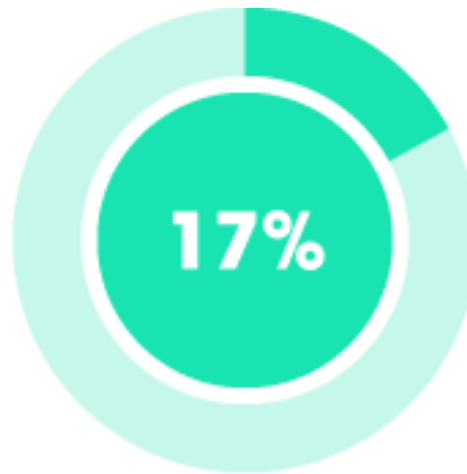
- **Game Engine**
- **Primeira versão lançada em 2005**
- **Plataformas:**
 - Windows, Linux, Mac
 - WEB (Web Player e Flash)
 - Celulares e Tablets (Android, iOS e Windows Phone)
 - Consoles (PS3, PS4, PSVita, XBOX 360, XBOX One, Wii)

O que é a Unity3D?

- Global game engine market share:



Unity



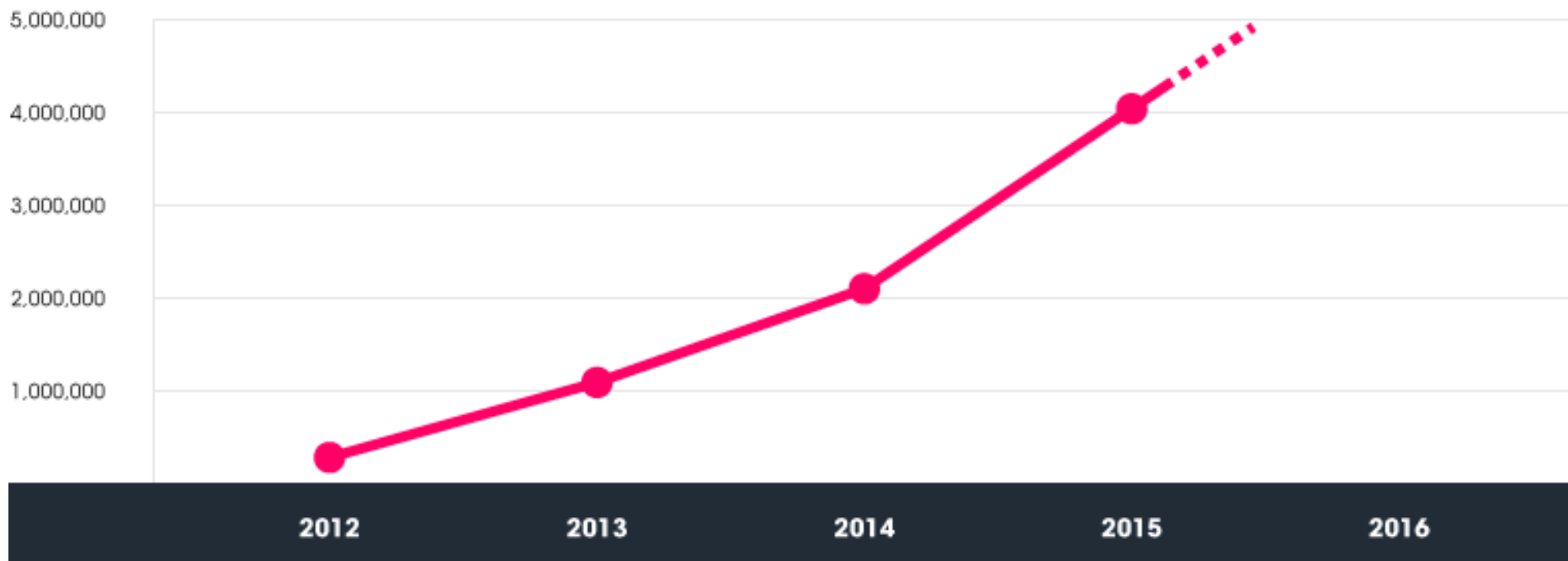
Closest competitor



Others

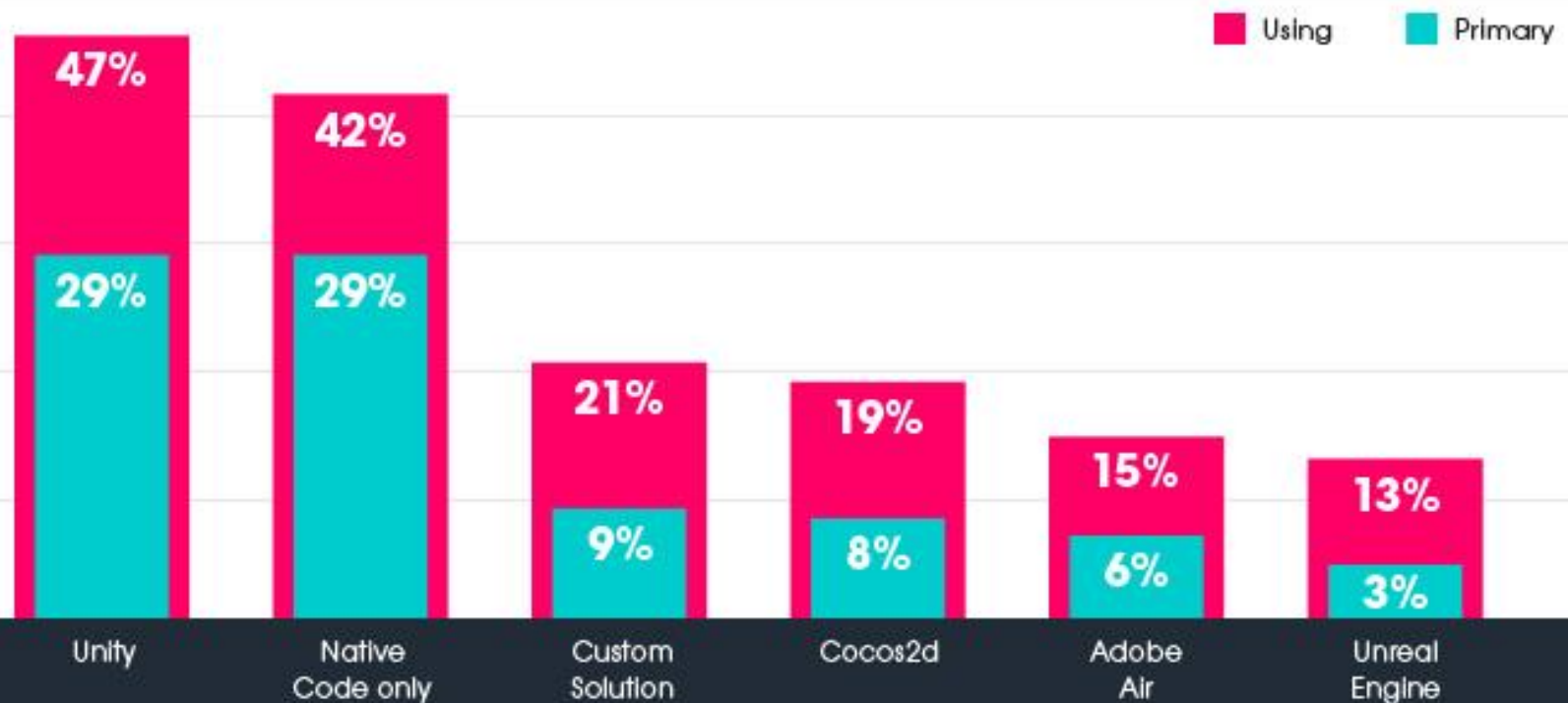
O que é a Unity3D?

- **Versão Gratuita desde 2009**
 - Mais de 4 milhões de registros em 2015



O que é a Unity3D?

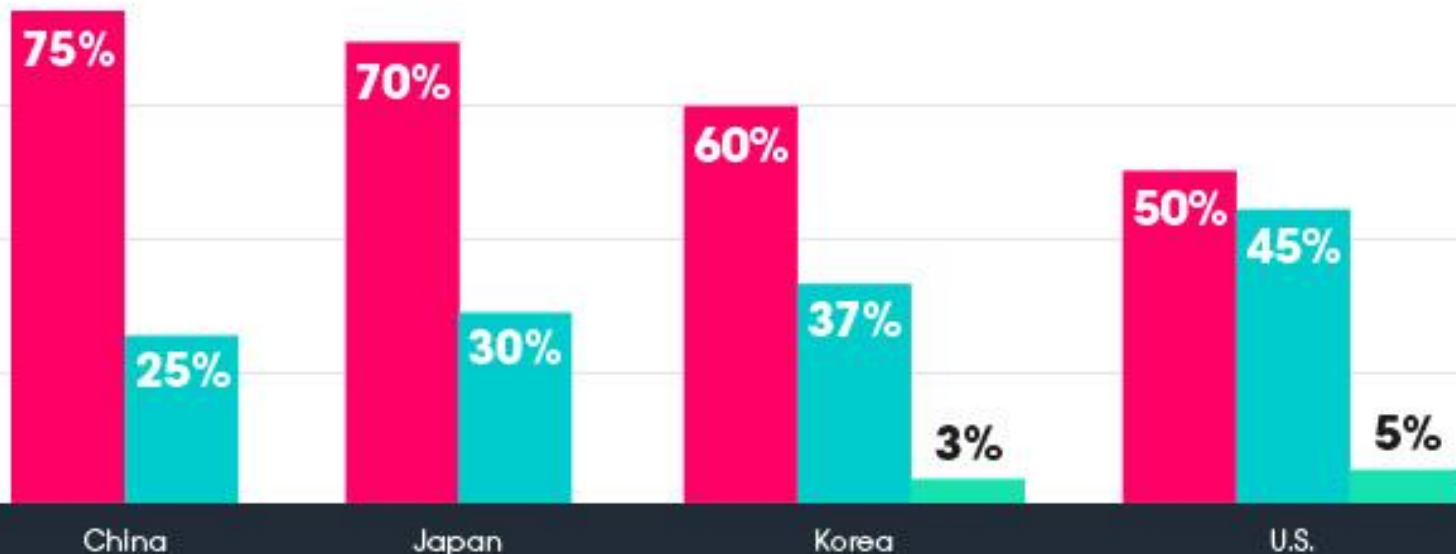
- Game engine mais popular entre os desenvolvedores atualmente:



O que é a Unity3D?

- Ferramenta mais utilizada no desenvolvimento de jogos 3D para dispositivos moveis:

Unity Internal tools Other game engine



O que é a Unity3D?

- **Utilizada por pequenas e grandes empresas:**
 - Cartoon Network, Coca-Cola, Disney, Electronic Arts, LEGO, Microsoft, NASA, Nexon, Nickelodeon, Square, Ubisoft, Warner Bros...

- **DirectX e OpenGL**

- **Script:**

- JavaScript (UnityScript)
- C#

- **Asset Store**



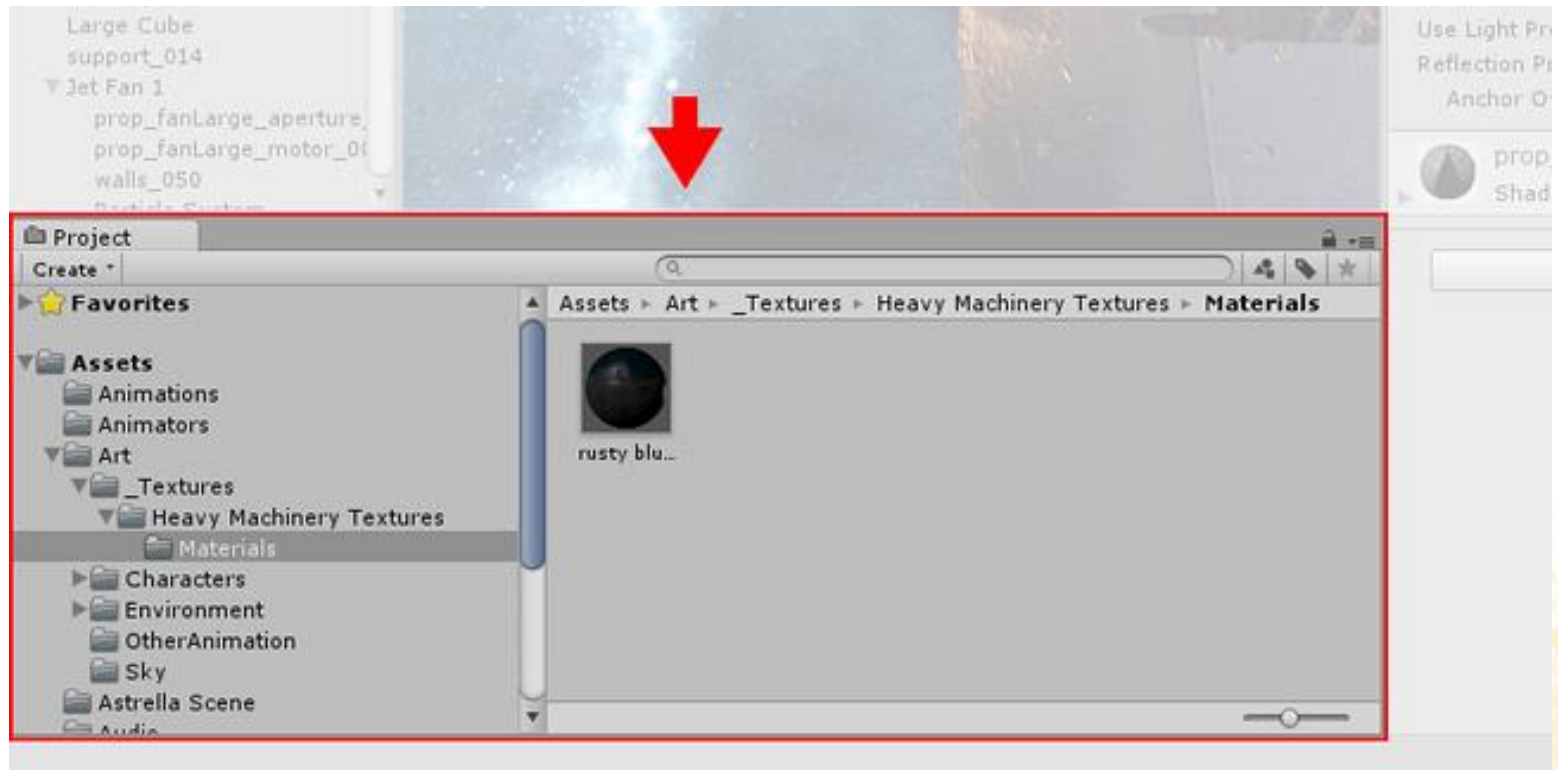
Alguns Jogos...



<http://unity3d.com/showcase/gallery>

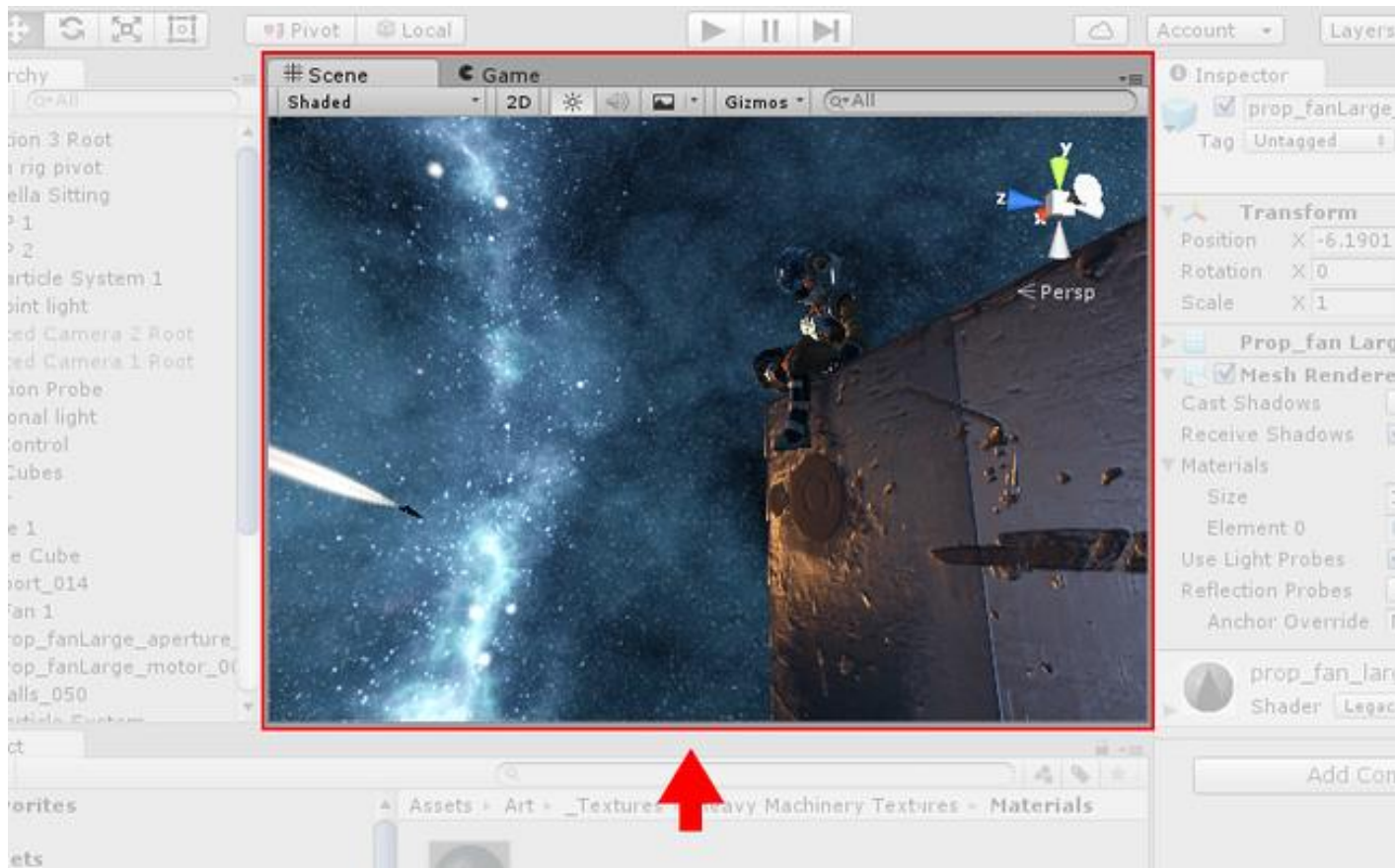
Unity3D - Interface Principal

- Project Window:



Unity3D - Interface Principal

- Scene View:



Unity3D - Interface Principal

- Scene View Navigation:

- Arrow Movement

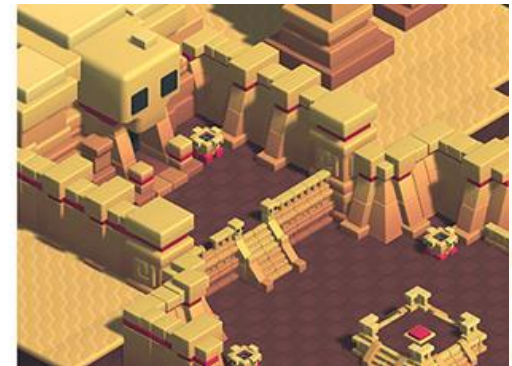
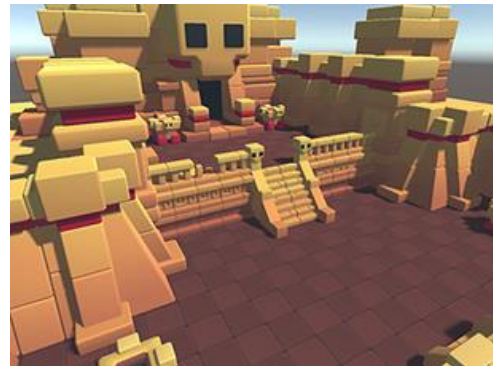


- Move, Orbit and Zoom



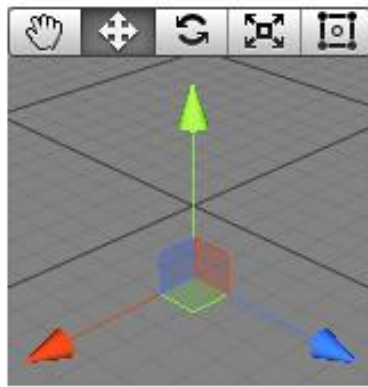
- Flythrough Mode

- Scene Gizmo

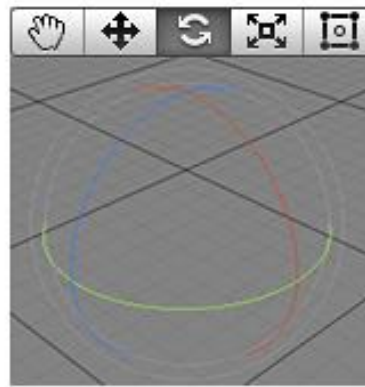


Unity3D - Interface Principal

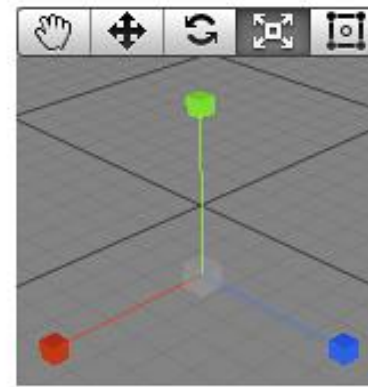
- Scene View:
 - Translate, Rotate, and Scale



Translate (W)



Rotate (E)



Scale (R)

- Control Bar



Unity3D - Interface Principal

- Game View:
 - Play Mode

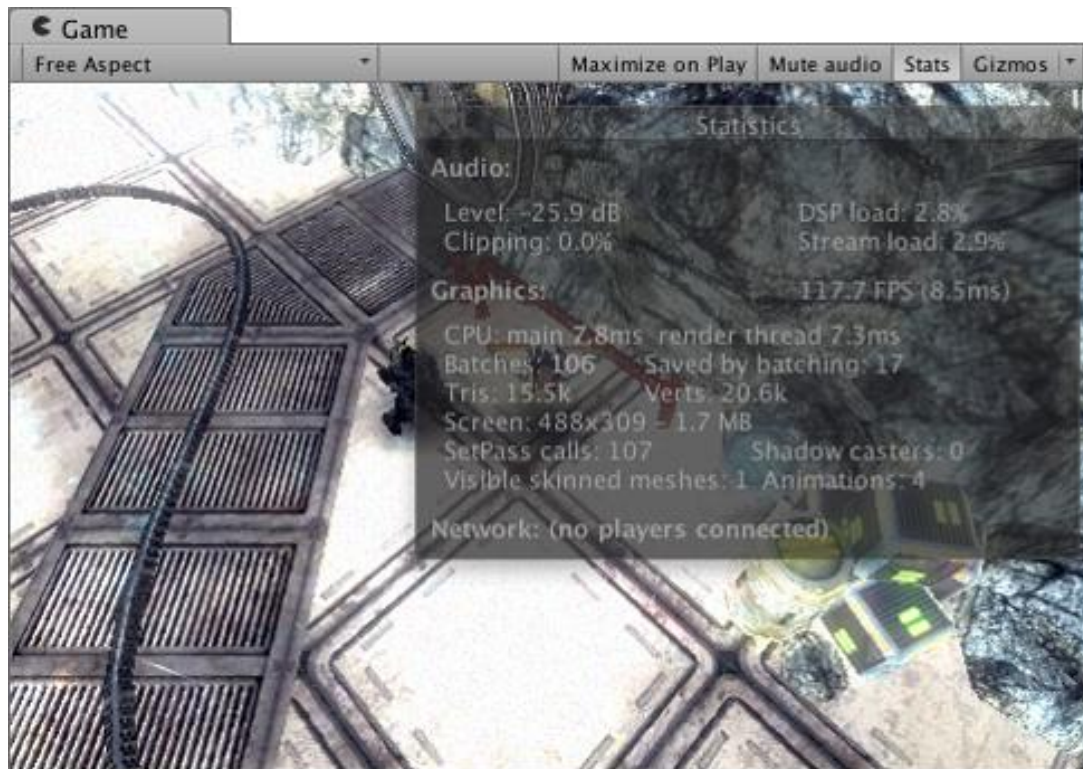


- Control Bar



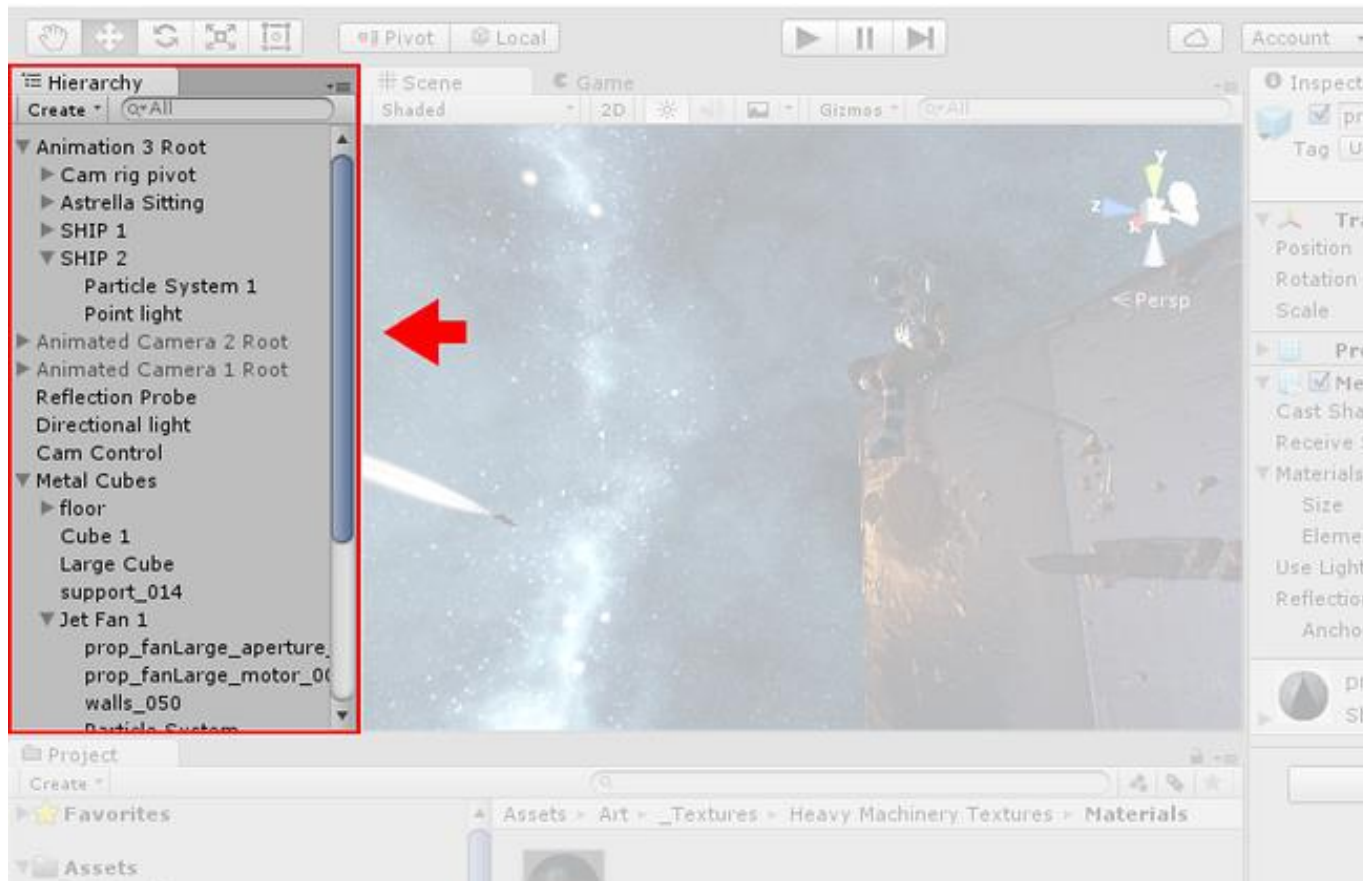
Unity3D - Interface Principal

- Game View:
 - Statistics



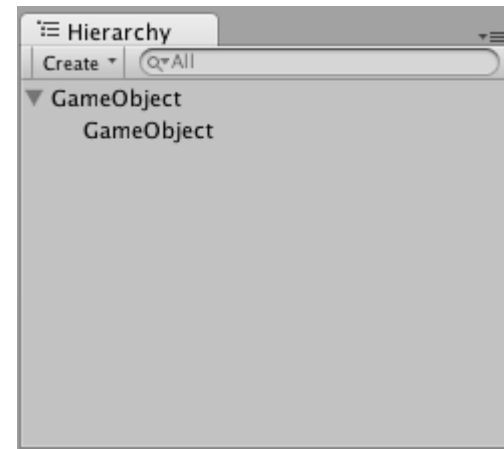
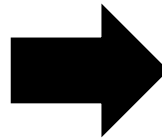
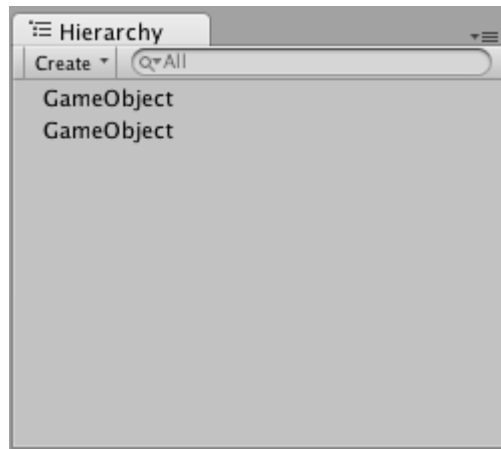
Unity3D - Interface Principal

- Hierarchy Window:



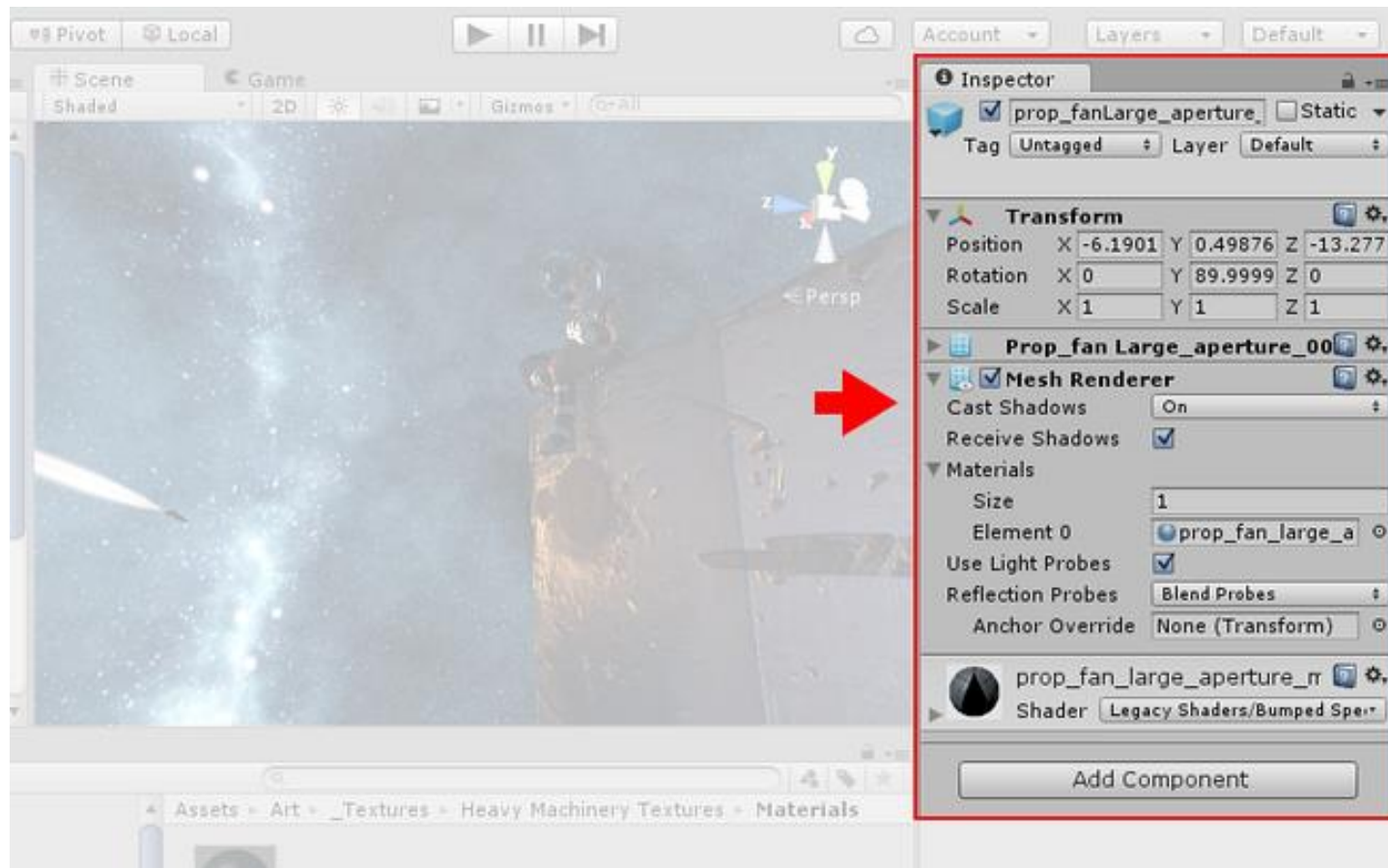
Unity3D - Interface Principal

- Hierarchy Window:
 - Parenting



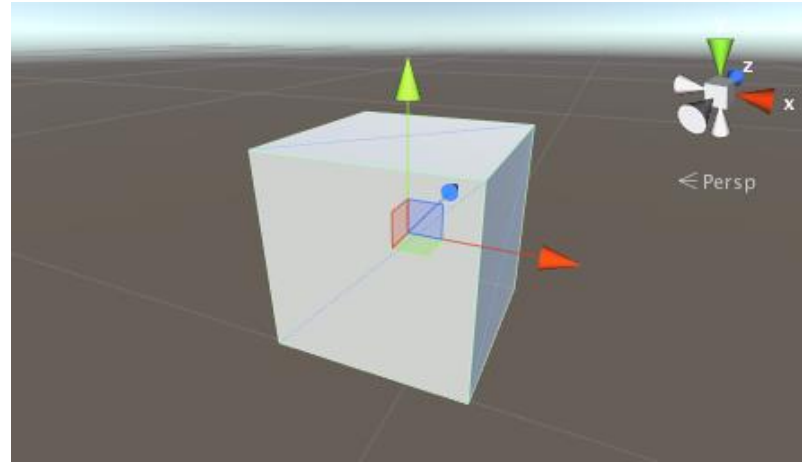
Unity3D - Interface Principal

- Inspector Window:

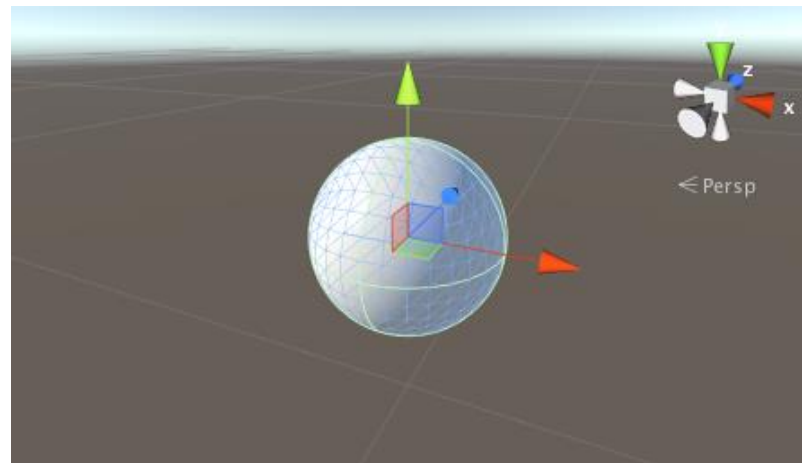


Unity3D – Objetos Primitivos

- Cubo

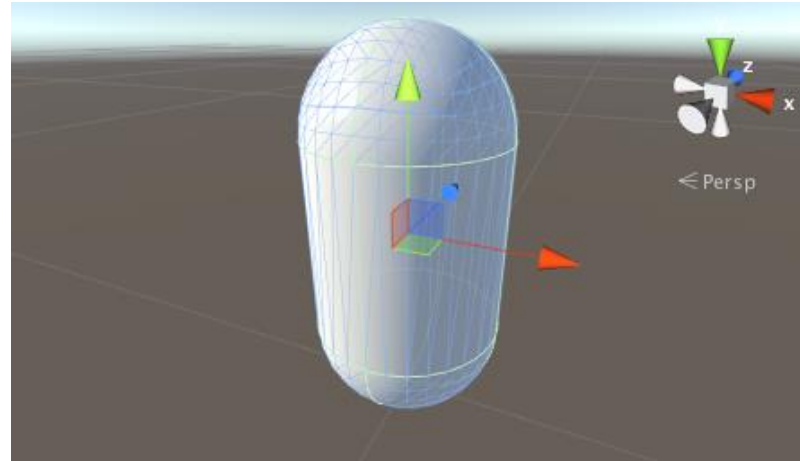


- Sphere

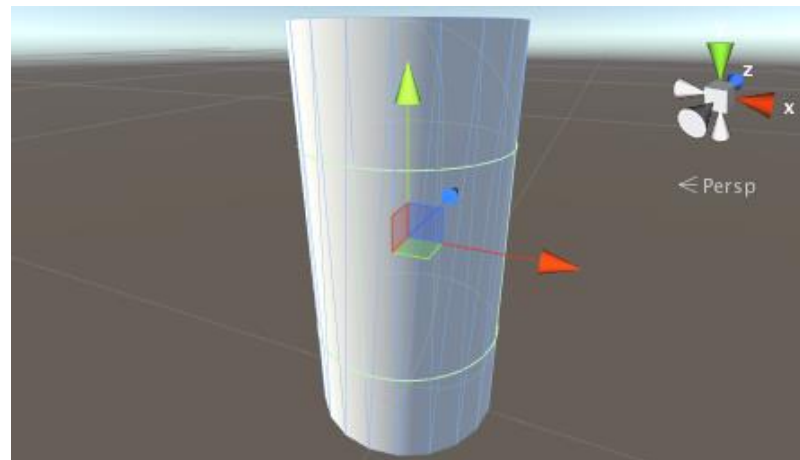


Unity3D – Objetos Primitivos

- Capsule

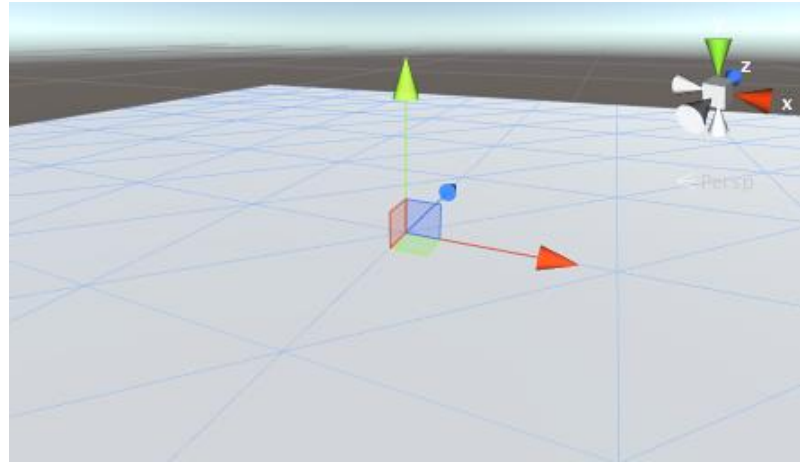


- Cylinder

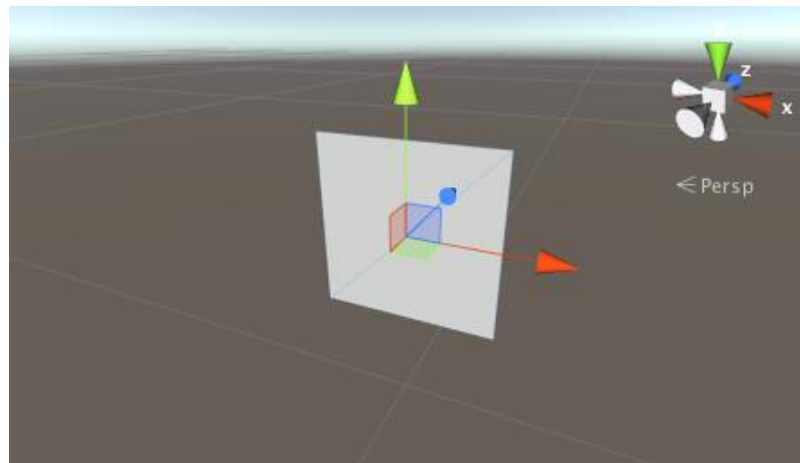


Unity3D – Objetos Primitivos

- Plane

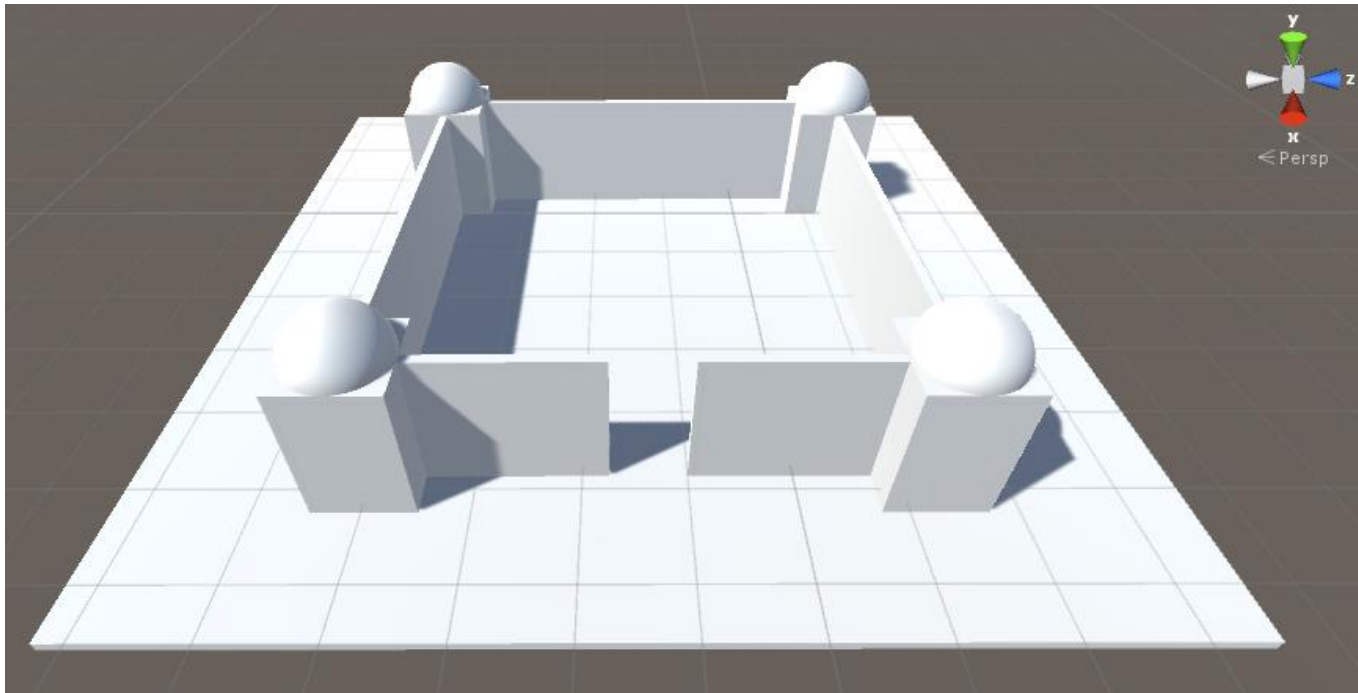


- Quad



Exercício 01

- Construa uma fortaleza simples utilizando os objetos primitivos da Unity 3D (cubos, esferas, capsulas, cilindros, planos e quads). A fortaleza deve ser semelhante a mostrada na figura abaixo.
 - **Atenção:** os pilares devem estar perfeitamente alinhados e os muros devem estar em uma mesma altura.



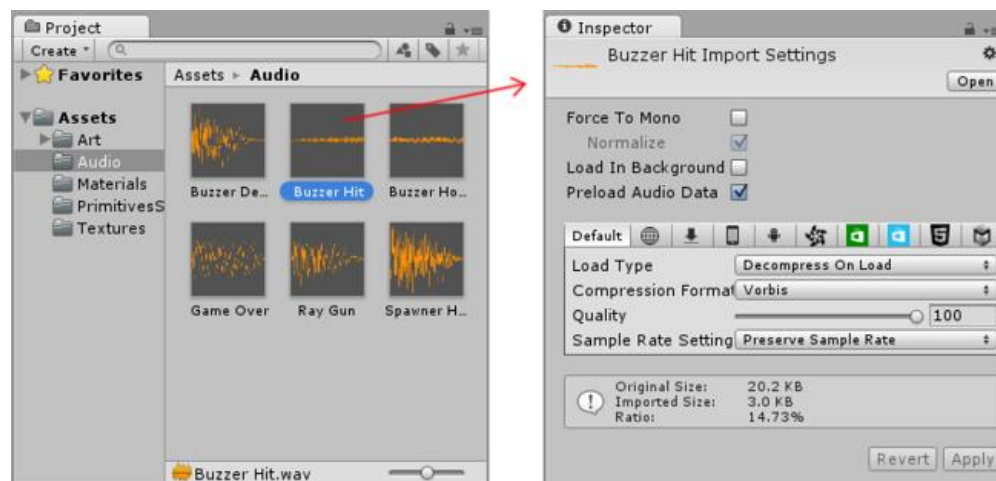
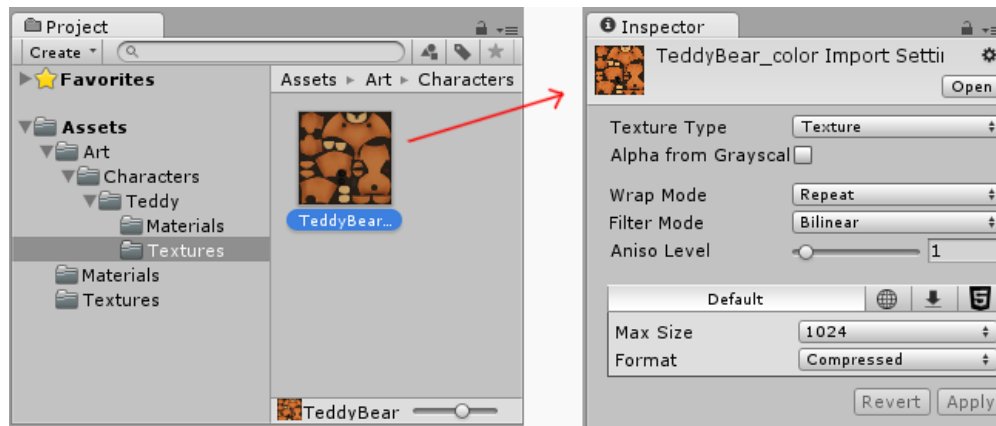
Unity3D – Importação de Assets

- **Arquivos comuns:**
 - Image Files
 - 3D Model Files
 - Meshes & Animations
 - Audio Files

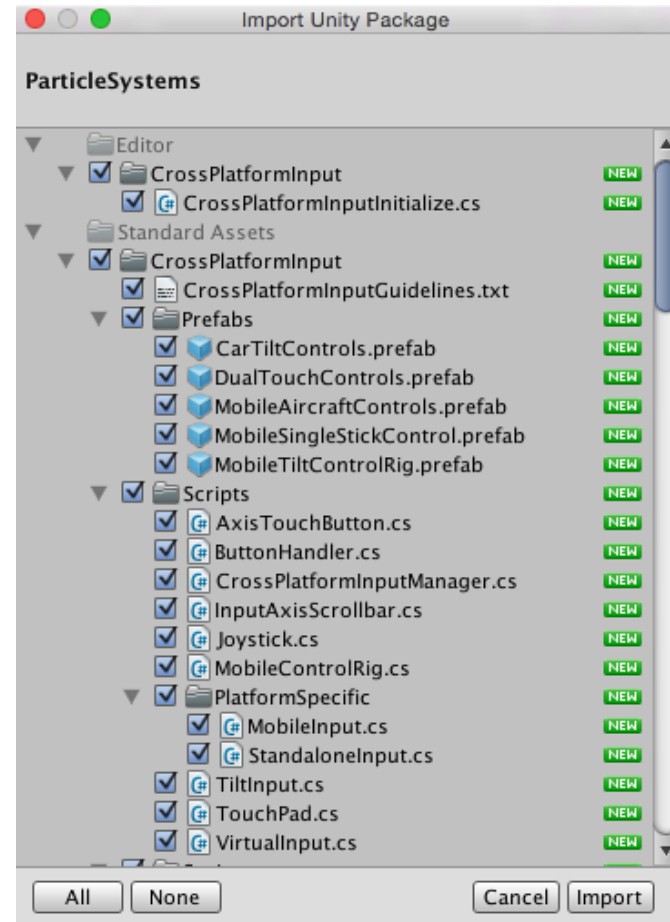
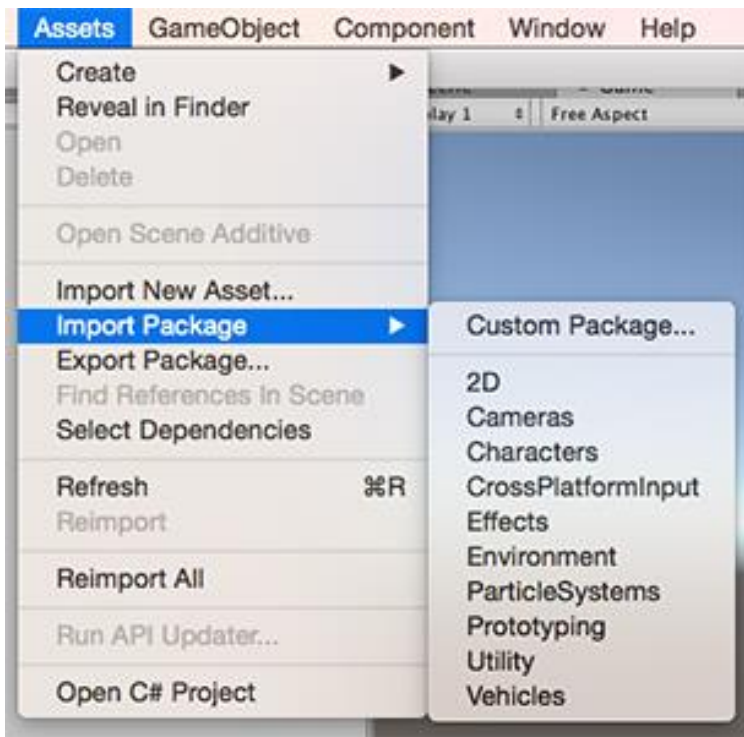


Unity3D – Importação de Assets

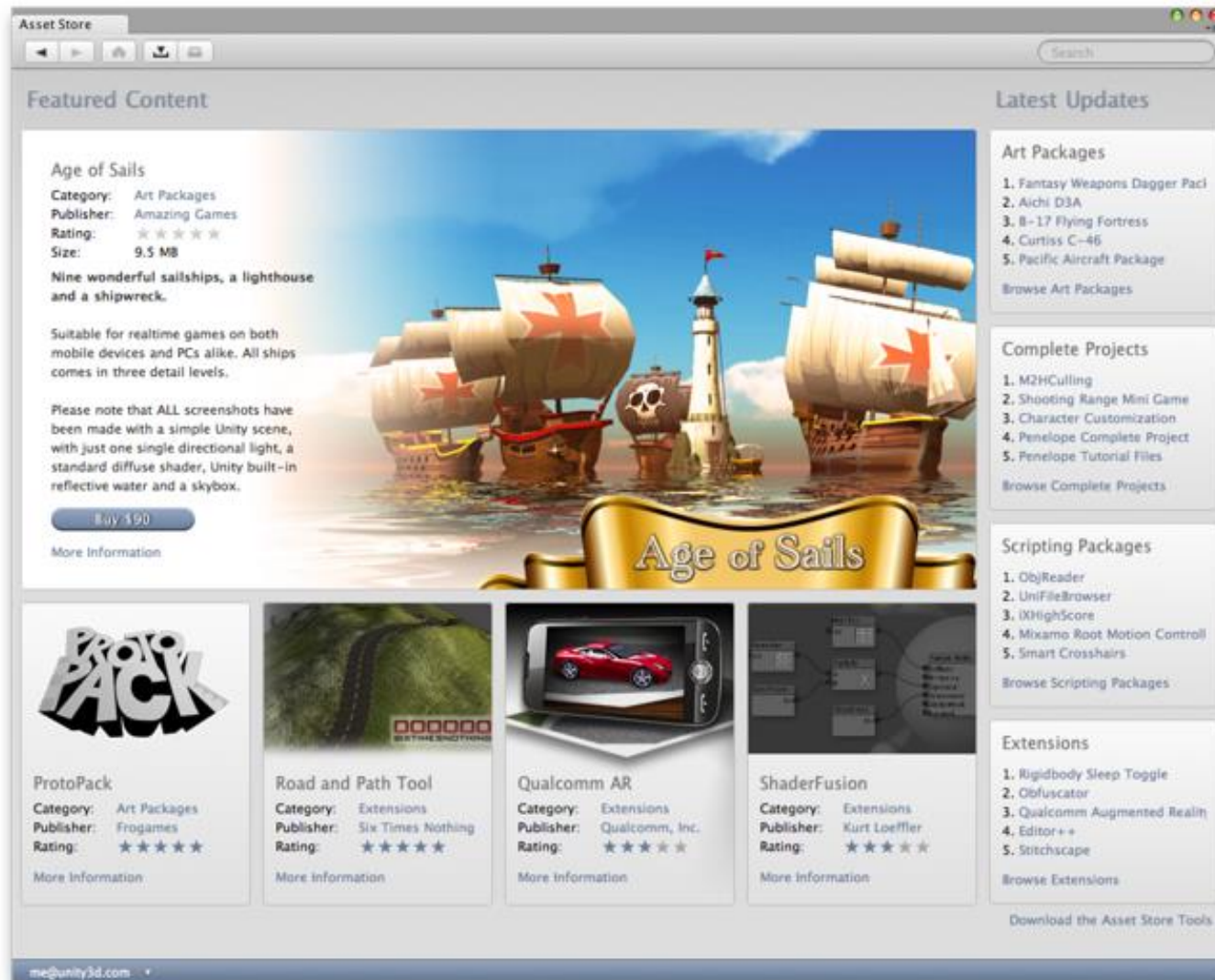
- **Import Settings:**



Unity3D – Standard Assets



Unity3D – Asset Store



The screenshot displays the Unity3D Asset Store interface. At the top, there's a search bar and navigation icons. The main content is divided into several sections:

- Featured Content:** Promotes the "Age of Sails" asset package. It includes a large image of a 3D scene with several sailing ships and a lighthouse. Text describes it as a package of nine wonderful sailships, a lighthouse, and a shipwreck, suitable for real-time games on mobile devices and PCs. It is priced at \$190.
- Latest Updates:** Lists recent updates under three categories:
 - Art Packages:** 1. Fantasy Weapons Dagger Pack, 2. Aichi D3A, 3. B-17 Flying Fortress, 4. Curtiss C-46, 5. Pacific Aircraft Package.
 - Complete Projects:** 1. M2HCulling, 2. Shooting Range Mini Game, 3. Character Customization, 4. Penelope Complete Project, 5. Penelope Tutorial Files.
 - Scripting Packages:** 1. ObjReader, 2. UniFileBrowser, 3. IxHighScore, 4. Mixamo Root Motion Control, 5. Smart Crosshairs.
- Extensions:** Lists five extensions:
 - 1. Rigidbody Sleep Toggle
 - 2. Obfuscator
 - 3. Qualcomm Augmented Reality
 - 4. Editor++
 - 5. Stitchscape

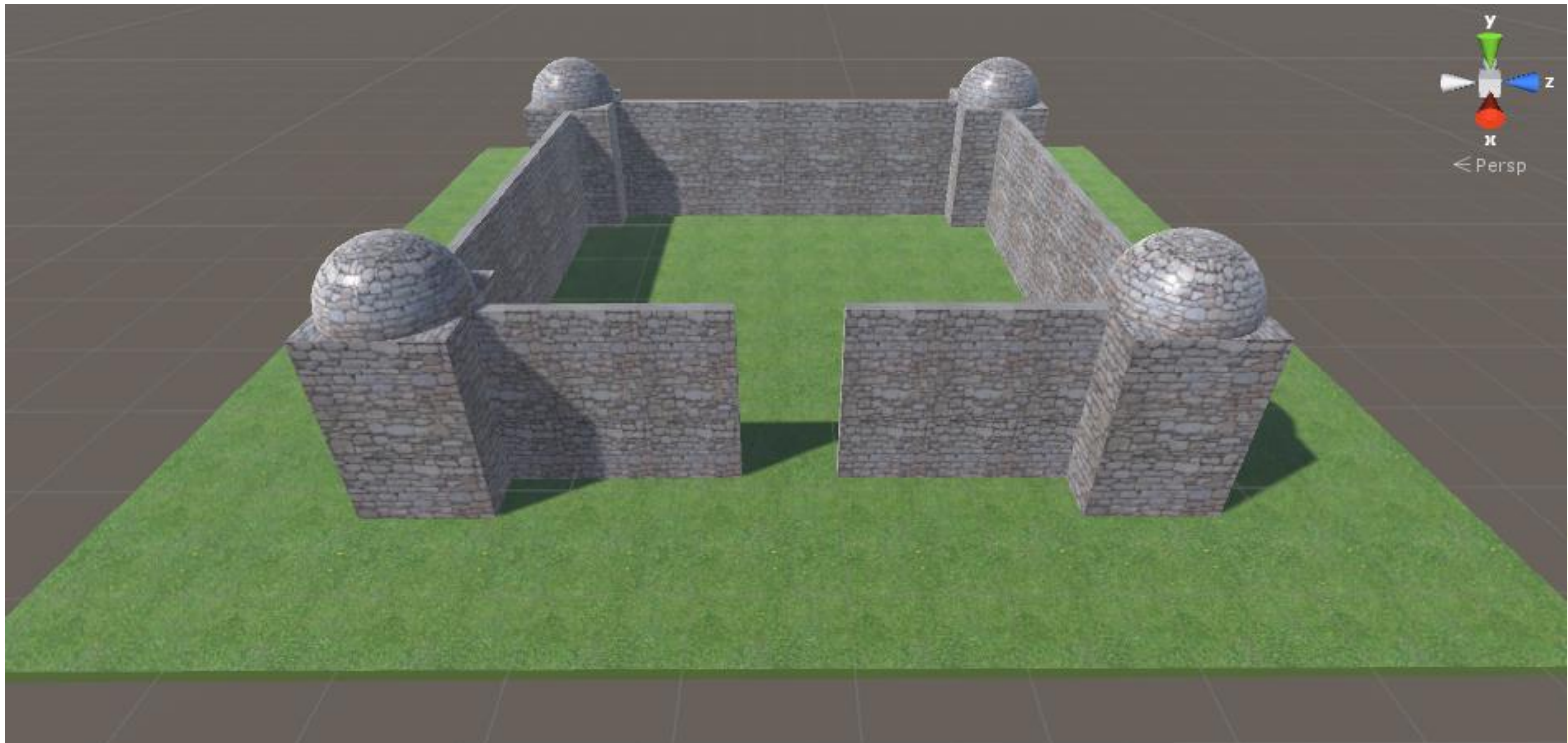
At the bottom, there are four smaller asset cards:

- ProtoPack:** Category: Art Packages, Publisher: Frogames, Rating: ★★★★★.
- Road and Path Tool:** Category: Extensions, Publisher: Six Times Nothing, Rating: ★★★★★.
- Qualcomm AR:** Category: Extensions, Publisher: Qualcomm, Inc., Rating: ★★★★★.
- ShaderFusion:** Category: Extensions, Publisher: Kurt Loeffler, Rating: ★★★★★.

At the bottom right, there is a link to "Download the Asset Store Tools". The bottom left corner shows the email "me@unity3d.com".

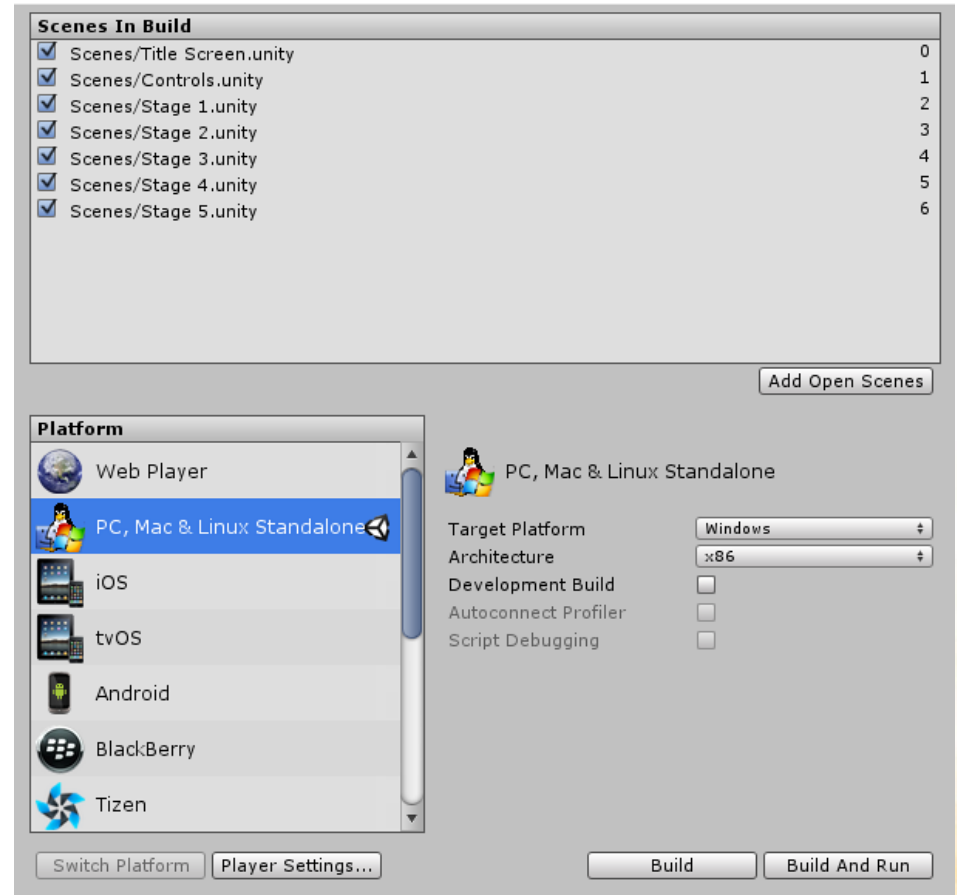
Exercício 02

- Continue a construção da fortaleza do exercício anterior adicionando texturas ao ambiente.
 - Texturas: www.inf.puc-rio.br/~elima/jogos3d/exercicio2_texturas.html



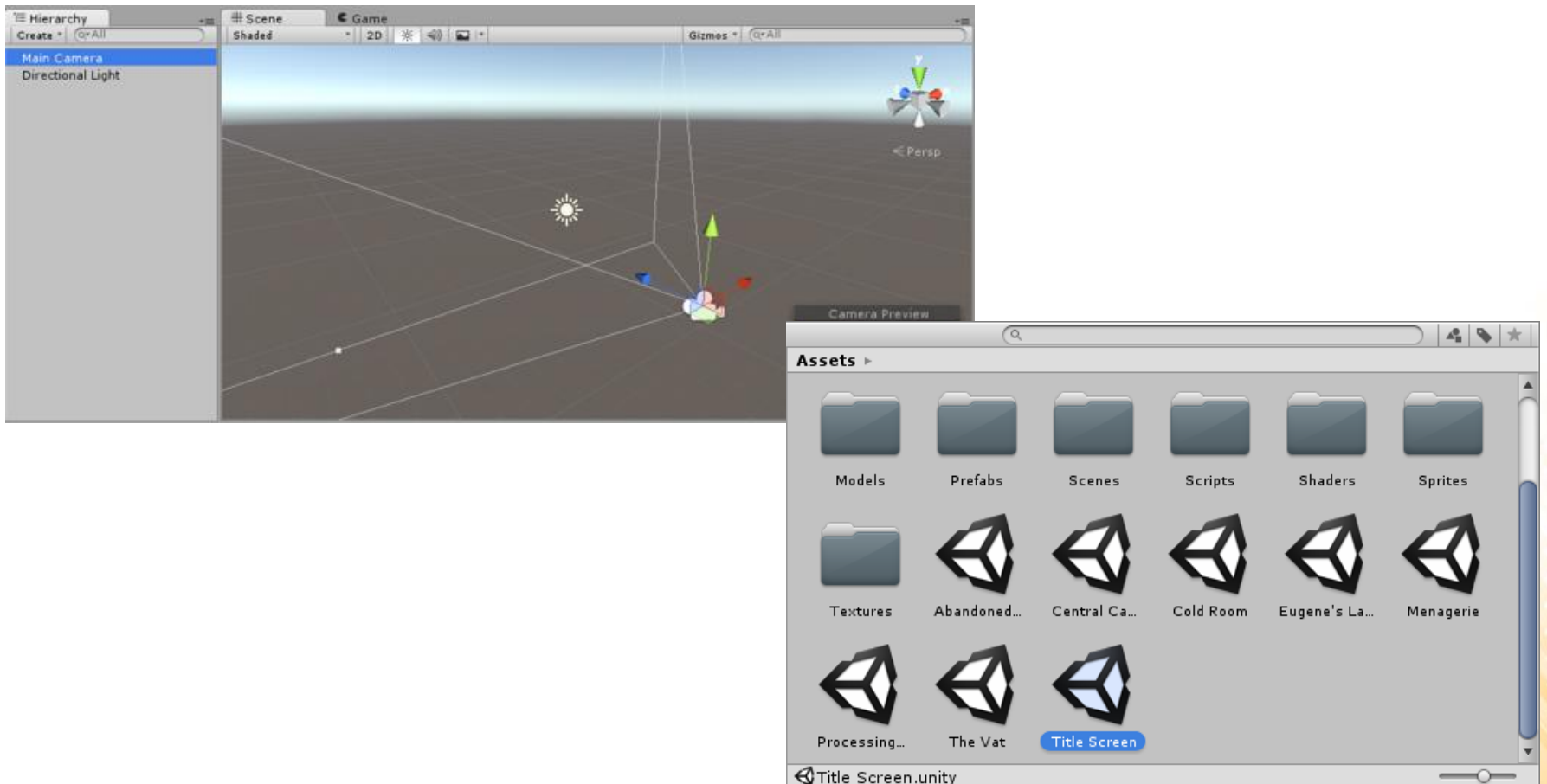
Unity3D – Build

- **Build:**
 - Windows, Mac, Linux
 - Web Player
 - iOS
 - Android
 - BlackBerry
 - Windows Phone
 - Samsung TV
 - Xbox 360, Xbox One
 - PS3, PS4, PSVita



Unity3D – Conceitos Essenciais

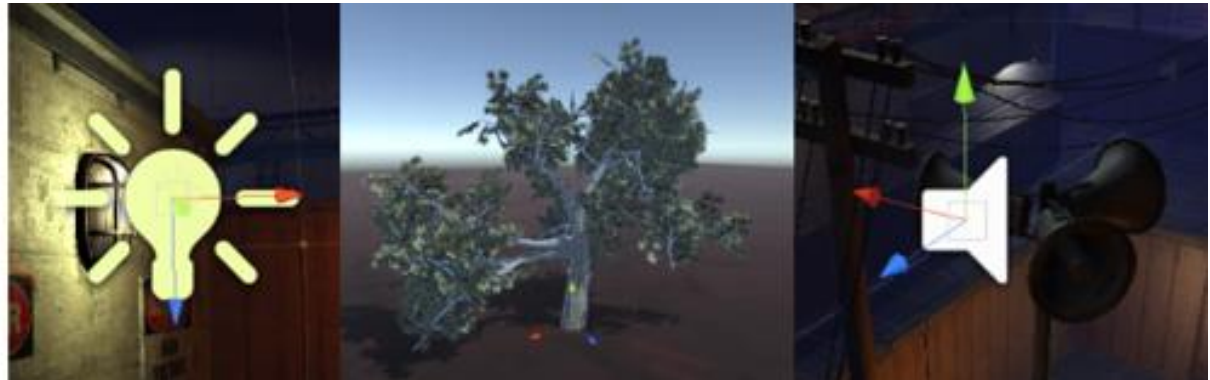
- Scenes



Unity3D – Conceitos Essenciais

- GameObjects

- Na Unity, todos objetos de um jogo são GameObjects



- GameObjects podem ser compostos por inúmeros Components

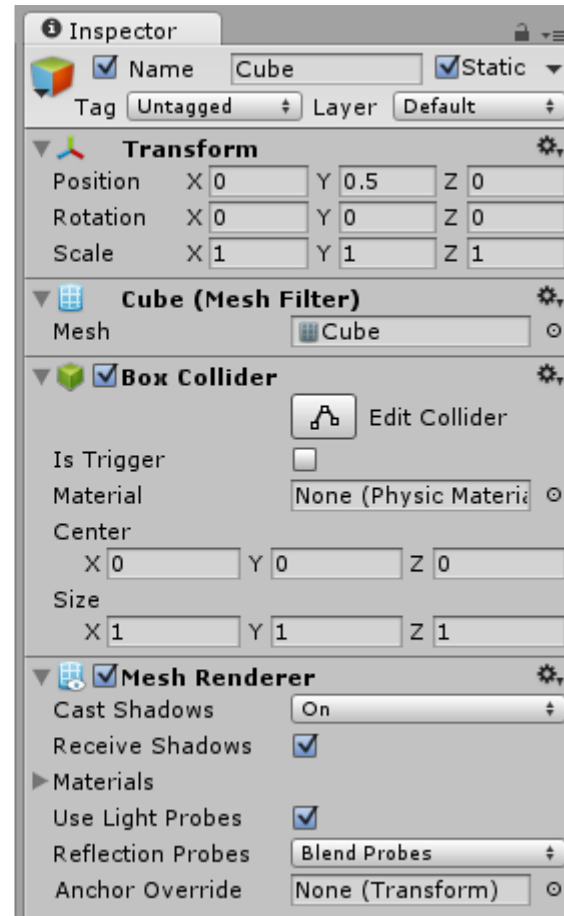
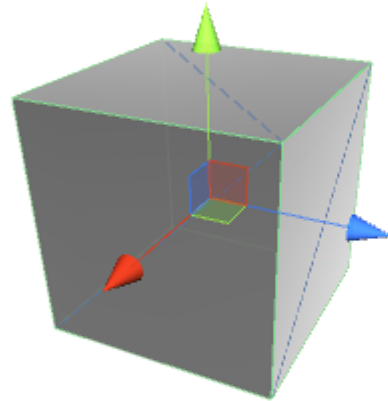
Unity3D – Conceitos Essenciais

- GameObjects e Components



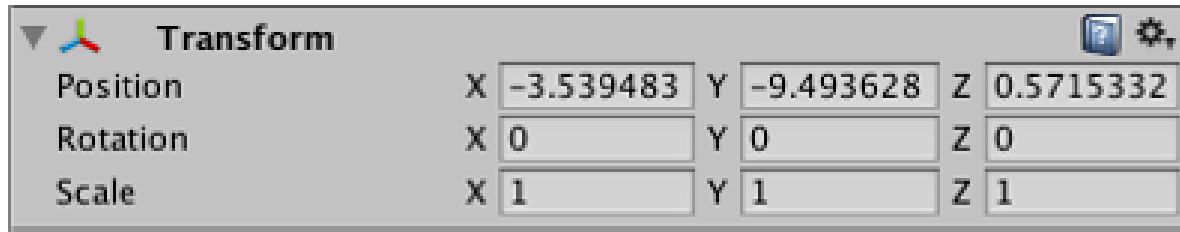
Unity3D – Conceitos Essenciais

- GameObjects e Components

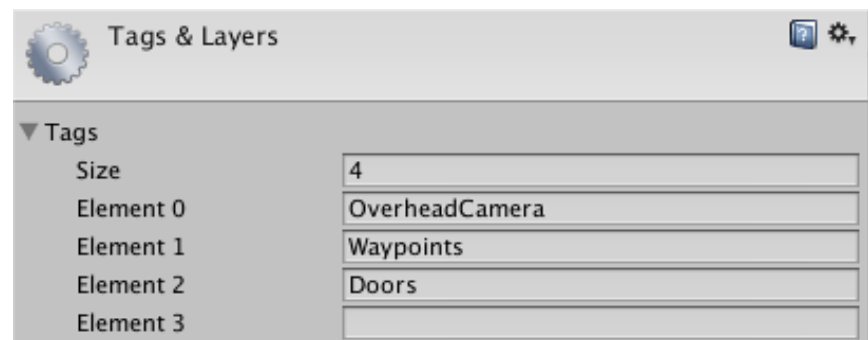
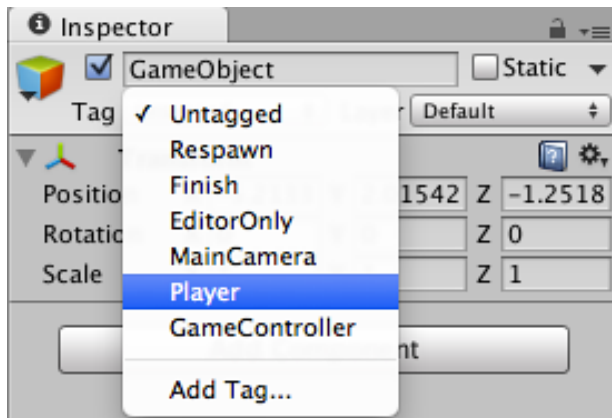


Unity3D – Conceitos Essenciais

- Todo GameObject possui um Component Transform:

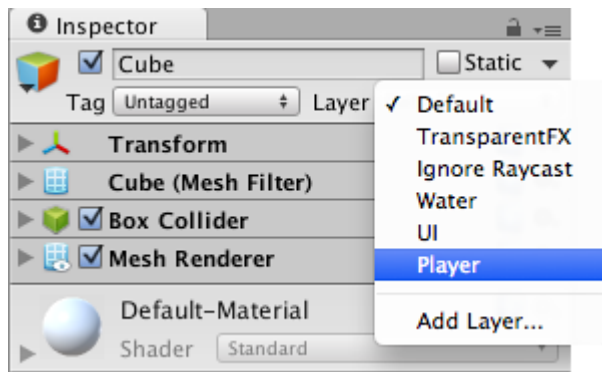


- Todo GameObject possui uma Tag:



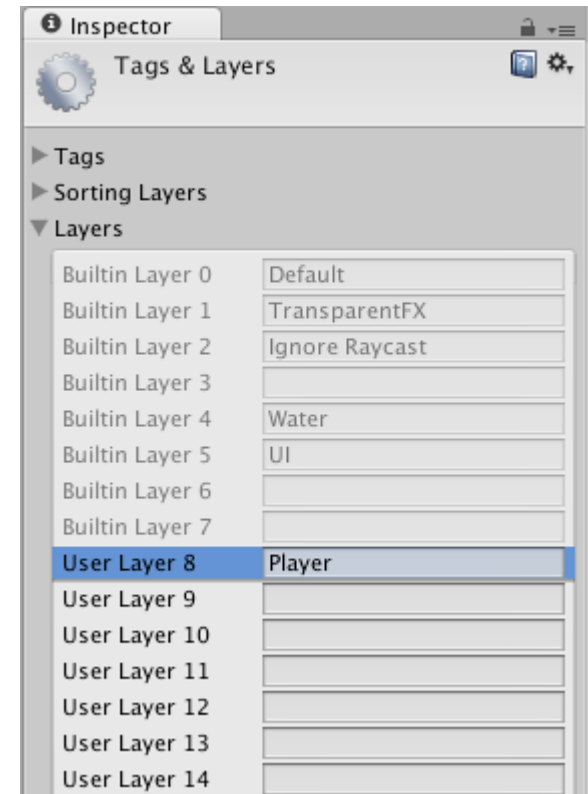
Unity3D – Conceitos Essenciais

- Todo GameObject possui um Layer:



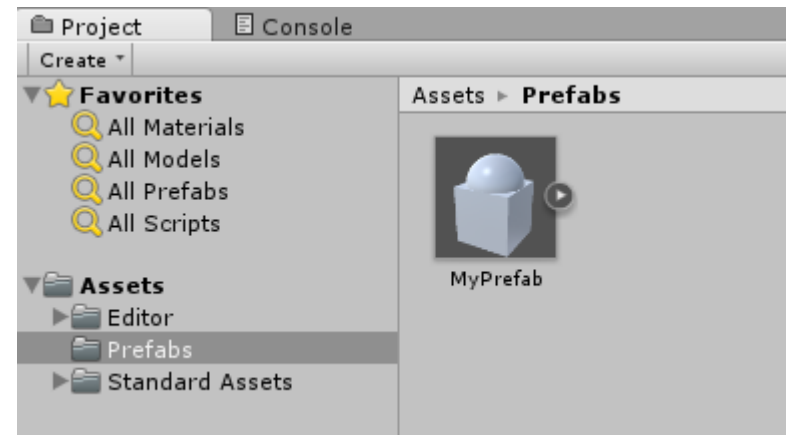
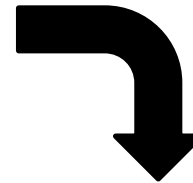
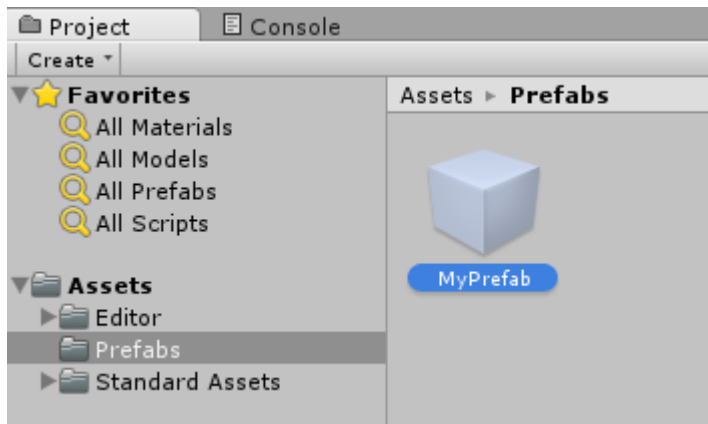
– Possíveis aplicações:

- Renderizar somente parte da cena;
- Iluminar somente uma parte dos objetos;
- Raycasting seletivo;
- Colisões;



Unity3D – Conceitos Essenciais

- Prefab:



Exercício 03

- Crie um prefab baseado na fortaleza elaborada nos exercícios anteriores e construa um conjunto de fortalezas interligadas (como mostrado na figura abaixo).

