

Terceros Encuentros de Programadores Java

Taller: jMonkeyEngine



Primero de todo...

1. Descargar e instalar:

- **Eclipse Ganymede:**

herramienta de desarrollo [<http://www.eclipse.org>]

- **jMonkeyEngine:**

motor de juegos openSource [[http:// www.jmonkeyengine.com](http://www.jmonkeyengine.com)]

Dos opciones:

1. Desarrollar con las librerías .jar
2. Desarrollar con el código fuente

2. Configurar eclipse*



Arquitectura

java.lang.Object

└ com.jme.app.AbstractGame

└ com.jme.app.BaseGame

└ com.jme.app.BaseSimpleGame

└ com.jme.app.SimpleGame



Arquitectura

AbstractGame	BaseGame	BaseSimpleGame	SimpleGame
Display Finished settings	throwableHandler	alphaBits Cam depthBits graphNode Input lightState Pause rootNode Samples showBounds showDepth showGraphs showNormals statNode stencilBits Timer Tpf wireState	
assertDisplayCreated finish getAttributes getVersion setConfigshowMode	getNewSettings getThrowableHandler setThrowableHandler start	cameraParallel cameraPerspective Cleanup initGame setupStatGraphs setupStats simpleInitGame simpleRender Quit simpleUpdate Reinit updateInput initSystem	doDebug render update



Primer contacto

```
public class Leccion01 extends SimpleGame {  
    public static void main(String[] args) {  
        // Crea la aplicación  
        Leccion01 app = new Leccion01();  
  
        // Inicia el programa  
        app.start();  
    }  
}
```











Ejecución de
la Clase

Creamos e
inicializamos
los objetos
de la escena

```
protected void simpleInitGame() {  
    // Creamos un caja  
    Box b = new Box("Mybox", new Vector3f(0, 0, 0), new Vector3f(1, 1, 1));  
    b.getLocalTranslation().addLocal(new Vector3f(5, 0, 0));  
    //para la geometria  
    b.setModelBound(new BoundingBox());  
    b.updateModelBound();  
  
    // La añadimos al grafo de escena  
    rootNode.attachChild(b);  
}  
}
```



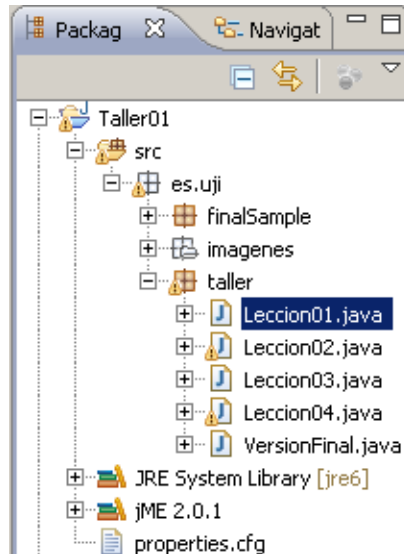
Teclas básicas

 W	avanzar	 T	mostrar la malla
 S	retroceder	 L	luces
 D	desplazarnos a la derecha	 N	mostrar las normales
 A	desplazarnos a la izquierda	 B	mostrar el BoundingBox
 Q	desplazarnos hacia arriba	ratón	rotaciones de la cámara
 Z	desplazarnos hacia abajo		



Lección 1

En la Clase “Leccion01”...



...añadir nuevos objetos a la escena



Objetos básicos:

AbstractBox: An eight sided box.

Arrow :A cylinder with a pyramid at one end.

AxisRods: Three coloured arrows, one pointing along each axis.

Box: A box with solid (filled) faces.

Capsule: A capsule is a cylindrical section capped with a dome at either end.

Cone: **Deprecated.** use [Cylinder](#).

Cylinder: A simple cylinder, defined by it's height and radius.

Disk: A flat discus, defined by it's radius.

Dodecahedron: A regular polyhedron with 12 faces.

Dome: A hemisphere.

Extrusion: An extrusion of a 2D object ([Line](#)) along a path (List of Vector3f).

GeoSphere: A polygon mesh approximating a sphere by recursive subdivision. [GeoSphere.Triangle](#)

Hexagon: Hexagon provides an extension of TriMesh.

Icosahedron: A regular polyhedron with 20 faces.

MultiFaceBox: The used Texture is 1 Unit wide and 8 Units high.

Octahedron: A regular polyhedron with 8 faces.

OrientedBox: This primitive represents a box that has options to orient it according to its X/Y/Z axis.

PQTorus: A parameterized torus, also known as a *pq* torus.

Pyramid: A four sided pyramid.

Quad: A four sided, two dimensional shape (a quadrilateral).

RegularPolyhedron: A polyhedron whose faces and edges are all identical.

RoundedBox

Sphere: Sphere represents a 3D object with all points equidistant from a center point.

StripBox: A box made from a strip mode tri-mesh.

Teapot: Teapot is the classical teapot model ready for you to use in jME! If you plan to texture this shape, use wrapmode WM_WRAP_S_WRAP_T.

Torus: An ordinary (single holed) torus.

Tube: A hollow cylindrical shape (the cylinder wall can have width).



Anotación

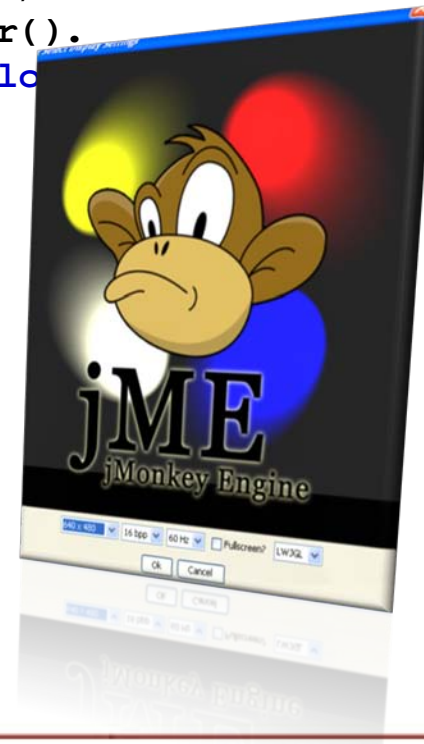
¿Cómo trasladamos los objetos creados?

```
b.getLocalTranslation().addLocal(new Vector3f(5, 0, 0));
```



Anotación

```
app.setConfigShowMode(ConfigShowMode.AlwaysShow,  
    Legion01.class.getClassLoader().  
    getResources().getURL("jme/legion01.jar"));
```



Anotación

```
Box b = new Box("Mybox", new Vector3f(0, 0, 0), new Vector3f(1, 1, 1));  
b.getLocalTranslation().addLocal(new Vector3f(5, 0, 0));
```

```
b.setModelBound(new BoundingBox());  
b.updateModelBound();
```



Lección 2

Crear el escenario del juego:

- Terreno
- Cielo



Lección 2

```
private void buildTerrain() {  
  
    // genera datos de terreno aleatorios  
    MidPointHeightMap heightMap = new MidPointHeightMap(64, 1f);  
  
    // crea el terrainblock  
    tb = new TerrainBlock("Terreno", heightMap.getSize(),  
        new Vector3f(50f, 1f, 50), heightMap.getHeightMap(),  
        new Vector3f(0, 0, 0));  
  
    tb.setModelBound(new BoundingBox());  
    tb.updateModelBound();  
  
    ...  
}
```



Lección 2

...

```
// texturas
ProceduralTextureGenerator pt = new ProceduralTextureGenerator(heightMap);
pt.addTexture(new ImageIcon(Leccion02.class.getClassLoader()
    .getResource("es/uji/imagenes/grassb.png")), -128, 0, 128);
pt.addTexture(new ImageIcon(Leccion02.class.getClassLoader()
    .getResource("es/uji/imagenes/dirt.jpg")), 0, 128, 255);
pt.addTexture(new ImageIcon(Leccion02.class.getClassLoader()
    .getResource("es/uji/imagenes/highest.jpg")), 128, 255, 384);
pt.createTexture(32);

// assign the texture to the terrain
TextureState ts = display.getRenderer().createTextureState();
ts.setEnabled(true);
Texture t1 = TextureManager.loadTexture(pt.getImageIcon().getImage(),
    Texture.MinificationFilter.Trilinear,
    Texture.MagnificationFilter.Bilinear, true);
ts.setTexture(t1, 0);
tb.setRenderState(ts);
scene.attachChild(tb);
}
```



Lección 2

```
private void buildSkyBox() {
    Skybox skybox = new Skybox("skybox", 1000, 1000, 1000);

    Texture north = TextureManager.loadTexture(Leccion02.class
        .getClassLoader().getResource("es/uji/imagenes/1.jpg"),
        Texture.MinificationFilter.BilinearNearestMipMap,
        Texture.MagnificationFilter.Bilinear);
    Texture south = TextureManager.loadTexture(Leccion02.class
        .getClassLoader().getResource("es/uji/imagenes/3.jpg"),
        Texture.MinificationFilter.BilinearNearestMipMap,
        Texture.MagnificationFilter.Bilinear);
    Texture east = TextureManager.loadTexture(Leccion02.class
        .getClassLoader().getResource("es/uji/imagenes/2.jpg"),
        Texture.MinificationFilter.BilinearNearestMipMap,
        Texture.MagnificationFilter.Bilinear);
    Texture west = TextureManager.loadTexture(Leccion02.class
        .getClassLoader().getResource("es/uji/imagenes/4.jpg"),
        Texture.MinificationFilter.BilinearNearestMipMap,
        Texture.MagnificationFilter.Bilinear);
```

...



Lección 2

...

```
Texture up = TextureManager.loadTexture(Leccion02.class
    .getClassLoader().getResource("es/uji/imagenes/6.jpg"),
Texture.MinificationFilter.BilinearNearestMipMap,
Texture.MagnificationFilter.Bilinear);
Texture down = TextureManager.loadTexture(Leccion02.class
    .getClassLoader().getResource("es/uji/imagenes/5.jpg"),
Texture.MinificationFilter.BilinearNearestMipMap,
Texture.MagnificationFilter.Bilinear);
```

```
skybox.setTexture(Skybox.Face.North, north);
skybox.setTexture(Skybox.Face.West, west);
skybox.setTexture(Skybox.Face.South, south);
skybox.setTexture(Skybox.Face.East, east);
skybox.setTexture(Skybox.Face.Up, up);
skybox.setTexture(Skybox.Face.Down, down);
skybox.preloadTextures();
skybox.setLocalTranslation(new Vector3f(1000,0,1000));
scene.attachChild(skybox);
```

```
}
```



Lección 2

```
private void buildLighting() {  
    DirectionalLight light = new DirectionalLight();  
    light.setDiffuse(new ColorRGBA(1.0f, 1.0f, 1.0f, 1.0f));  
    light.setAmbient(new ColorRGBA(0.5f, 0.5f, 0.5f, 1.0f));  
    light.setDirection(new Vector3f(1, -1, 0));  
    light.setEnabled(true);  
    lightState.attach(light);  
}
```



Lección 2 - Tareas

1. Descomentar las funciones
2. Añadir el código necesario a...

```
protected void simpleInitGame() {  
  
    ...  
  
}
```



Lección 2 - Solución

```
protected void simpleInitGame() {  
  
    rootNode.attachChild(scene);  
  
    buildTerrain();  
    buildSkyBox();  
    buildLighting();  
  
    scene.updateGeometricState(0.0f, true);  
    scene.updateRenderState();  
  
    cam.getLocation().set(500, 200, 500);  
    cam.setFrustumFar(5000);  
    cam.update();  
  
}
```



Lección 3

Crear el “Player”:

- Un jugador
- Asociar la cámara al jugador



Lección 3 – Paso 1

Construimos el “player”

```
private void buildPlayer() {  
  
    // Construimos la geometria del jugador  
    Box b = new Box("box", new Vector3f(), 0.35f, 0.25f, 0.5f);  
    b.setModelBound(new BoundingBox());  
    b.updateModelBound();  
  
    player.attachChild(b);  
    player.setLocalTranslation(new Vector3f(100, 0, 100));  
    player.updateWorldBound();  
  
    scene.attachChild(player);  
  
}
```



Lección 3 – Paso 2

1. Descomentamos la función:

```
buildChaseCamera
```

2. Realizamos la llamada desde la función:

```
simpleInitGame
```



Lección 4

Dar movimiento al jugador



Lección 4 – Paso 1

Creamos los manejadores...

```
private void buildInput() {  
  
    KeyBindingManager.getKeyBindingManager().set("avanza", KeyInput.KEY_UP);  
    KeyBindingManager.getKeyBindingManager().set("retrocede", KeyInput.KEY_DOWN);  
    KeyBindingManager.getKeyBindingManager().set("derecha", KeyInput.KEY_RIGHT);  
    KeyBindingManager.getKeyBindingManager().set("izquierda", KeyInput.KEY_LEFT);  
  
}
```



Lección 4 – Paso 2

En la función `simpleUpdate` se recogen los manejadores y se realiza las acciones oportunas

```
...
if(KeyBindingManager.getKeyBindingManager().isValidCommand("avanza")){
    player.getLocalTranslation().addLocal(.1f, 0, 0);
}else if (KeyBindingManager.getKeyBindingManager().isValidCommand("retrocede")){
    player.getLocalTranslation().addLocal(-.1f, 0, 0);
}

if (KeyBindingManager.getKeyBindingManager().isValidCommand("derecha")){
    player.getLocalTranslation().addLocal(0, 0, .1f);
}else if (KeyBindingManager.getKeyBindingManager().isValidCommand("izquierda")){
    player.getLocalTranslation().addLocal(0, 0, -.1f);
}
...
```



Ejemplo final

