
Game :
Learning Space
Done by: Ainsley Chang Qi Jie, Jovan Lim Yu Hang, Lin Zhenming, Varsha Kulkarni, Yeow Dao Xing
....


Learning Space

SOLUTION

TARGET AUDIENCE

Secondary school students

ENGAGING

Captivating and Exciting

EFFECTIVE

Implicit Learning

ENCOURAGING

Motivates to continue exploring and learning

01

Key aspects of Game Engine

Design Pattern

Factory (Scalability, Reusability)

- Scalability: Enemy class
- Reusability: Entity Class, Different Manager Class

Singleton (Single Instance to be globally Accessed)

- Reusability: SceneManager

02

Improvements to Game Engine

Improvements to Game Engine

TMX Map Loader

Previous way of loading map and entities:

PlayScene.java | EntityManager.java

```
25
26      public void initialize() {
27          createPlayer(new Vector2(64, 32));
28
29          createBoss(new Vector2(576, 32));
30          createEnemy(new Vector2(192, 32));
31          createEnemy(new Vector2(384, 32));
32
33          createCoin(new Vector2(256, 32));
34          createCoin(new Vector2(448, 32));
35
36          createTerrain(new Vector2(0, 0), 1056, 32);
37          createTerrain(new Vector2(0, 32), 32, 32);
38          createTerrain(new Vector2(128, 32), 32, 32);
39          createTerrain(new Vector2(320, 32), 32, 32);
40          createTerrain(new Vector2(512, 32), 32, 32);
41          createTerrain(new Vector2(924, 32), 32, 32);
42      }
```

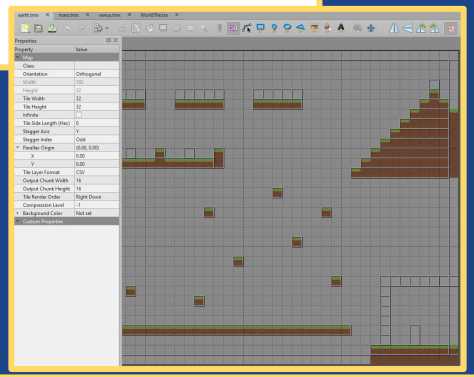
New implementation

PlayScene.java

```
124         mapLoader = new TmxMapLoader();
125         map = mapLoader.load(mapString);
126         renderer = new OrthogonalTiledMapRenderer(map);
```

PlayScene.java | EntityManager.java

```
51
52      public void initialize() {
53  //      Create Boundary
54          for(MapObject object : map.getLayers().get(1).getObjects().getByType(RectangleMapObject.class)){
55              Rectangle rect = ((RectangleMapObject) object).getRectangle();
56
57              Vector2 position = new Vector2(rect.getX(), rect.getY());
58              int width = (int)rect.getWidth();
59              int height = (int)rect.getHeight();
60
61              createBoundary(position, width, height);
62          }
```



Improvements to Game Engine

Animation

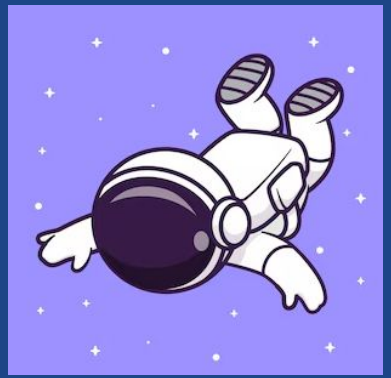
Player Animations

Static Image Animations

Unique Features

Different Worlds and Box2D

Different Worlds



Gravity

Velocity

Unique Features

Educational Aspects

Signboards

Treasure Chests

Unique Features

Win/Lose Condition

Win

Lose

03

Game Engine Implementation

04

Game Demonstration