

# . FOOP Final Report

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## Team Info

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Team Name: 四個人的OO小日子

- 熊育霆 B07902119
- 陳柏諺 B09902061
- 陳翰生 B06902121
- 簡謙益 B08705029

## Job Distribution

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- 熊育霆 B07902119
  - Distributing jobs
  - Program & system structure
  - Implementation of fundamental functions
  - Import BGM & background
- 陳柏諺 B09902061
  - Implementation of many classes
  - Fixing miscellaneous issues
- 陳翰生 B06902121
  - Implementation of a few classes
  - Icon selection
- 簡謙益 B08705029
  - Implementation of a few classes
  - This report
  - Improve game experience & difficulty

## Relations between Classes

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### **TowerDefenseApp**

Our main function. It contains gameflow, most of game logic, UI and input.

### **TowerDefenseFactory**

Handle the construction of each entity in the game, such as enemies, towers, bullets, background.

### **TowerDefenseType**

A simple enum class which contains the types of entity.  
The type is used in collision handlers.

## components

The `Component` class is a special class in FXGL, which is attached to an entity. Then we can do something with component, such as get information in of a tower (damage, attacking radius, etc.) or call a method which should belong to some entity.

In the `component` folder, we define a few child class of `component` to make the game development flow simpler.

## collision

Defines some collision handler when a bullet hits an enemy.

## event

Defines some events.

# Advantages of Our Design

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## Open for Extension

In our design, it can be quite handy to add new tower types and features simply by implementing new components, new collision handlers and adding them into factory.

We can also easily implement new types of enemy in the future by revising game factory.

## Properly Designed Difficulty

In our design, we have well adjusted the parameters for the towers and the enemies so that the game comes quite challenging but passable.

## Disadvantage of Our Design

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### Incapable of Handling Game Timer Well (Yet)

When implementing one of the tower classes, the poison tower, we found ourselves incapable of handling time-dependent tag on the enemy. This makes maintaining poisoned state redundant in the aspect of implementation.

### Crude User Interface

The current user interface is not aesthetic enough. Nevertheless, this disadvantage can be easily conquered by a talented artist since we have made the insertion of image an adjustable template.

## References & Packages We have Used

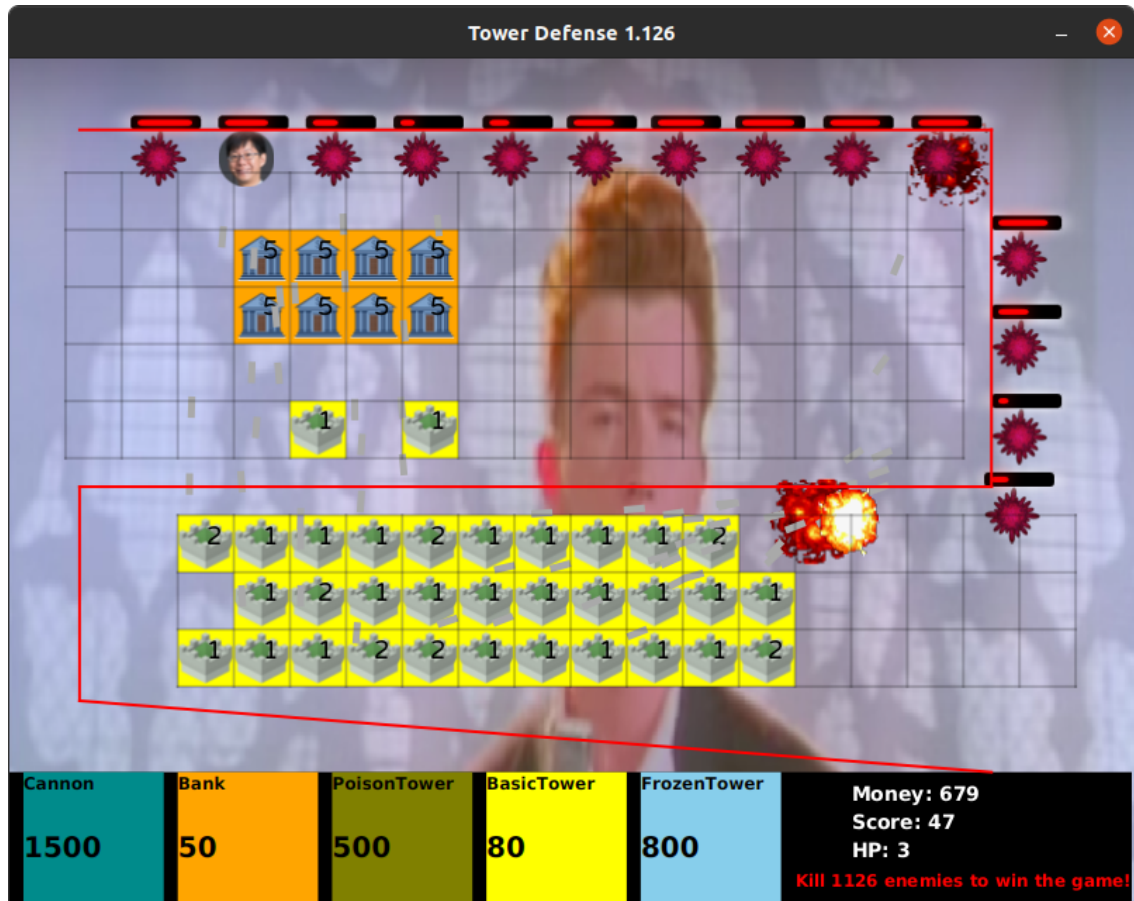
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- [GitHub Open-source Package: java FXGL framework](#)
- [YouTube: Rick Astley - Never Gonna Give You Up \(Official Music Video\)](#)
- [Appier Team Member Intro](#) for a handsome man's mug shot

## How to Play Our Game?

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To increase readability for player, we decide to write the following part in Chinese.



## 主要操作

玩家一開始具備10點生命值以及100 dollars，藉由以下操作執行相對應的動作：

滑鼠左鍵：將城塔放置在方格中、將城塔升級

滑鼠右鍵：將城塔拋售

左鍵點擊下方的城塔類別可以選擇要放置的塔的種類：

## 城塔類型

### 銀行（Bank）

- 費用：50 dollars
- 技能：生產錢
- 能力基值：5 dollars / second

### 普攻塔（BasicTower）

- 費用：80 dollars
- 技能：對敵人造成單體攻擊
- 能力基值：45 HP / shot
- 射程：500
- 彈速：600
- 蓄彈時間：0.25秒

## 毒藥塔 (PoisonTower)

- 費用：500 dollars
- 技能：對敵人造成單體毒性攻擊，持續3秒，傷害隨時間倍化，效果可疊加
- 能力基值：20 HP / shot / second
- 射程：300
- 彈速：300
- 蓄彈時間：1秒

## 冰凍塔 (ForzenTower)

- 費用：800 dollars
- 技能：對敵人造成單體冰凍攻擊，減緩敵人移動速度，持續1秒，效果可疊加
- 能力基值：5 HP / shot
- 緩速幅度：0.5倍
- 射程：300
- 彈速：300
- 蓄彈時間：1秒

## 加農砲 (Cannon)

- 費用：1500 dollars
- 技能：對敵人造成範圍爆炸性攻擊
- 能力基值：200 HP / shot
- 爆炸範圍：200
- 射程：200
- 彈速：300
- 蓄彈時間：5秒

## 敵人類型

### COVID-19

- 移動速度：60
- 技能：自爆並對玩家造成1點傷害

### Assignment Summoner: LHT

- 移動速度：60
- 技能：自爆並對玩家造成5點傷害

## 勝利條件

擊倒1126個敵人！