DragonBall Pac-Man Game

https://pacman-team-dragonball.herokuapp.com/

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Contents

- Design Decisions
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- UML Diagram and Design Pattern
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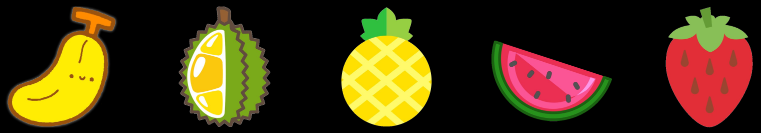
Implementation

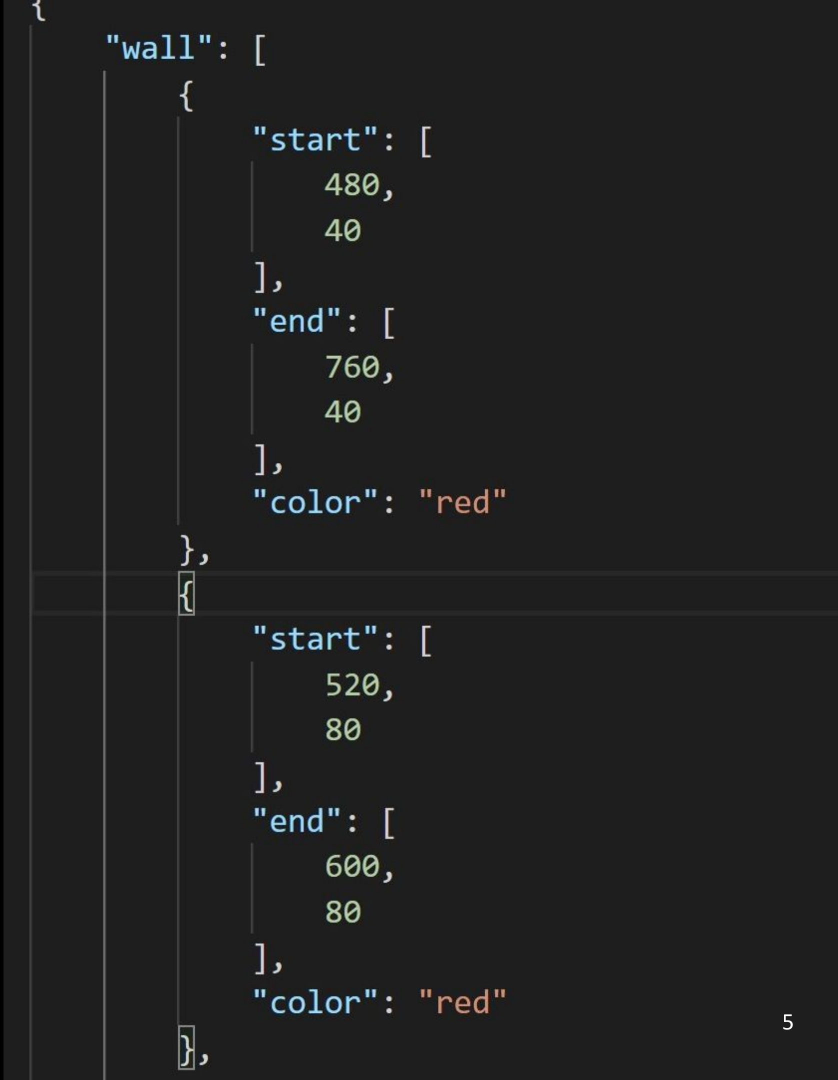
User Extensibility

Design Decisions

Design decisions

- Use JSON file to describe the game map.
- Use token to allow multiple users to play game simultaneously.
- 5 Kinds of Fruits: Banana, Durian, Pineapple, Watermelon and Strawberry.





```
{
    "wall": [
        {
            "start": [
                480,
                40
            ],
            "end": [
                760,
                40
            ],
            "color": "red"
        },
        {
            "start": [
                520,
                80
            ],
            "end": [
                600,
                80
            ],
            "color": "red"
        },
```

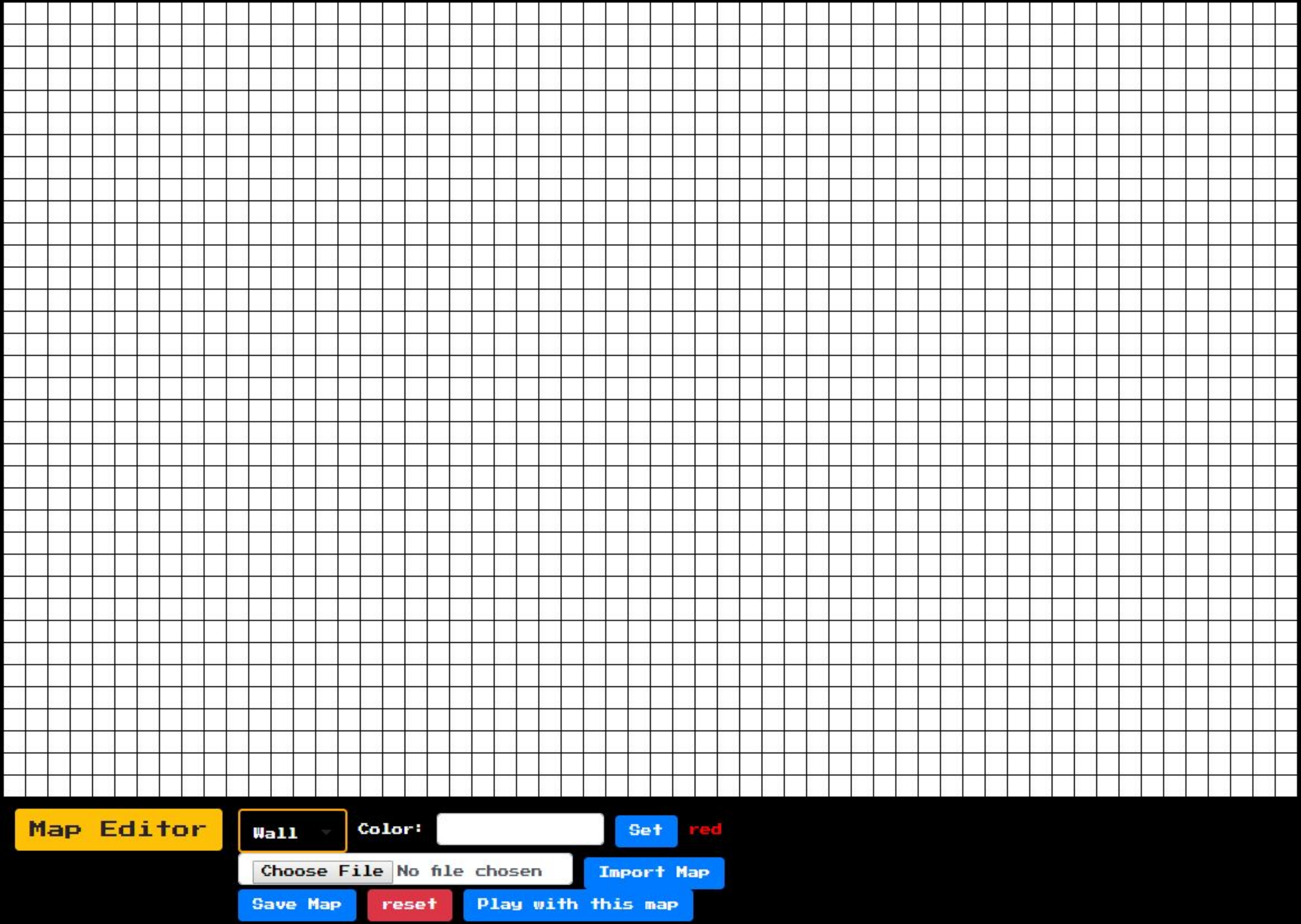
User extensibility

Map Editor

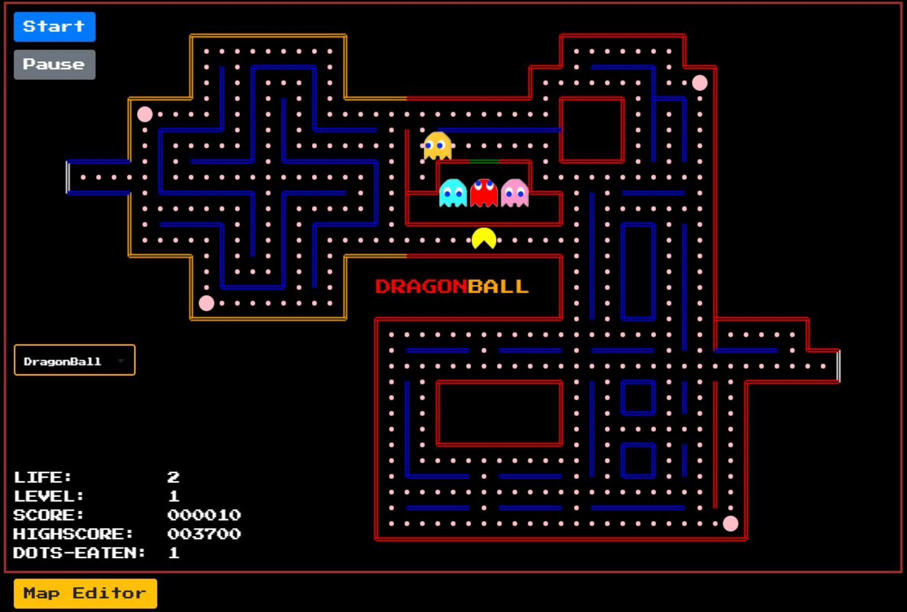
- Draw walls, pac-dots, energizers, tunnels
- Download map as JSON file
- Import local JSON file and continue working on it!
- Play your own map at any time

Choices

- User can choose different built in maps, Dragonball or Basketball, etc.

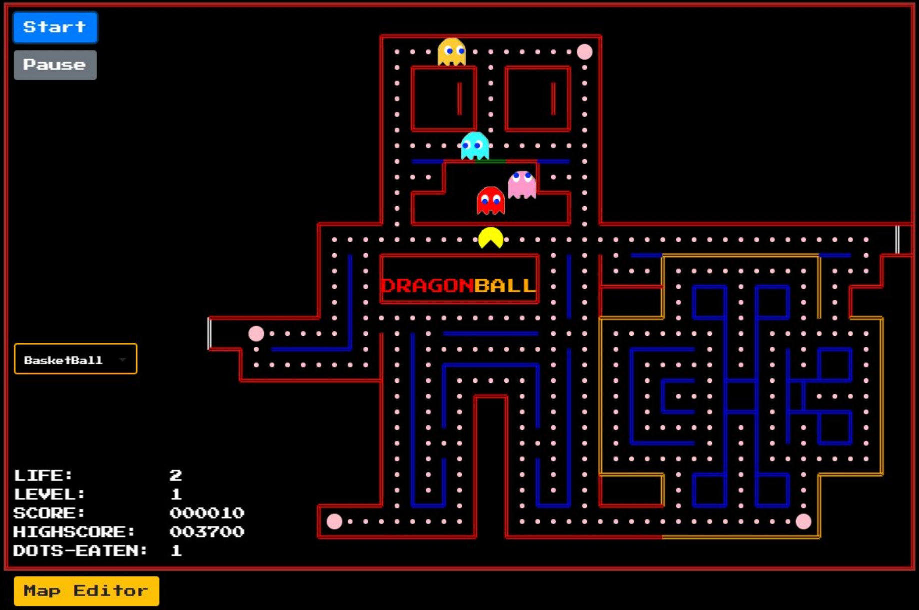

Map Editor
Wall
Color:
Set
red
Choose File
No file chosen
Import Map
Save Map
reset
Play with this map

DragonBall



LIFE: 2
LEVEL: 1
SCORE: 000010
HIGHSCORE: 003700
DOTS-EATEN: 1

Basketball



LIFE: 2
LEVEL: 1
SCORE: 000010
HIGHSCORE: 003700
DOTS-EATEN: 1

Controller

Requests

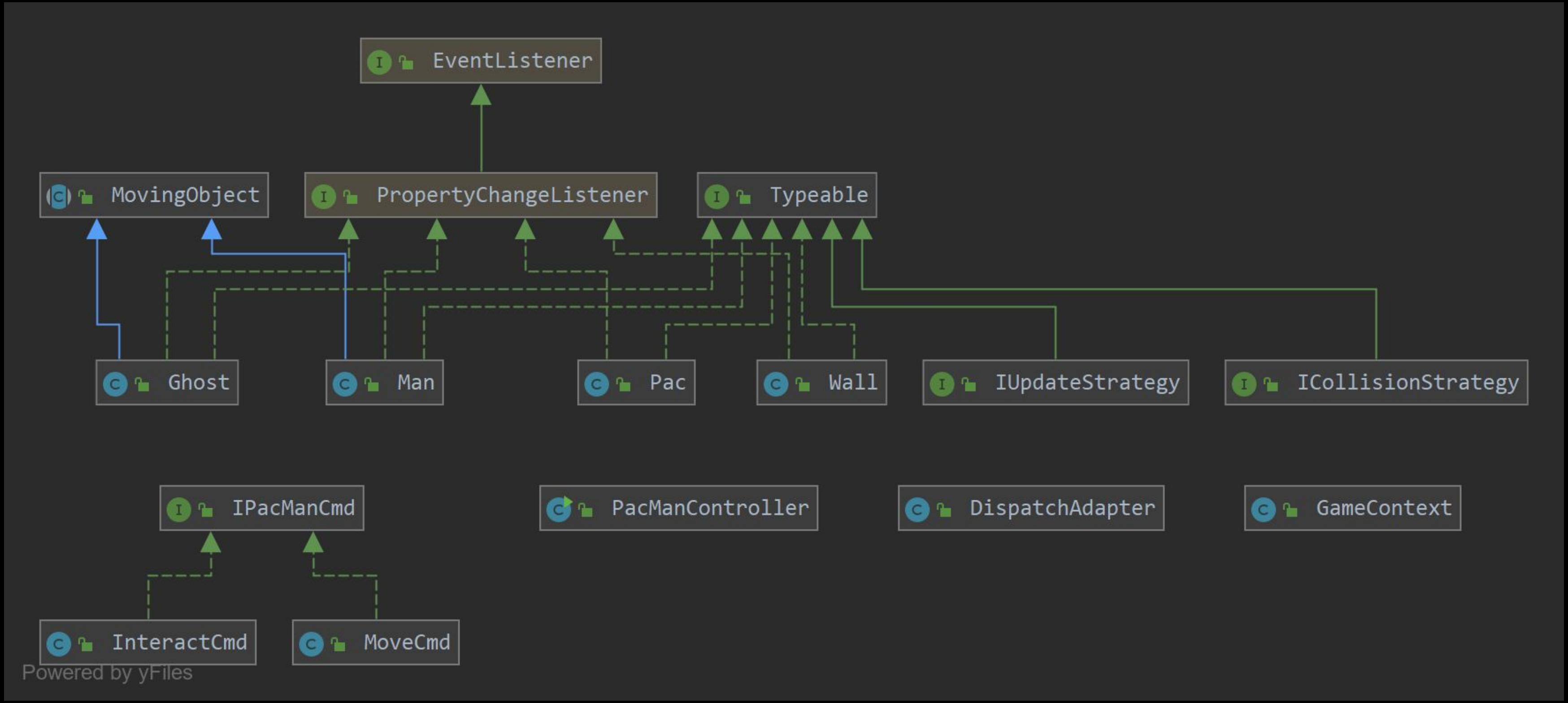
- Get requests from front end

Mapping

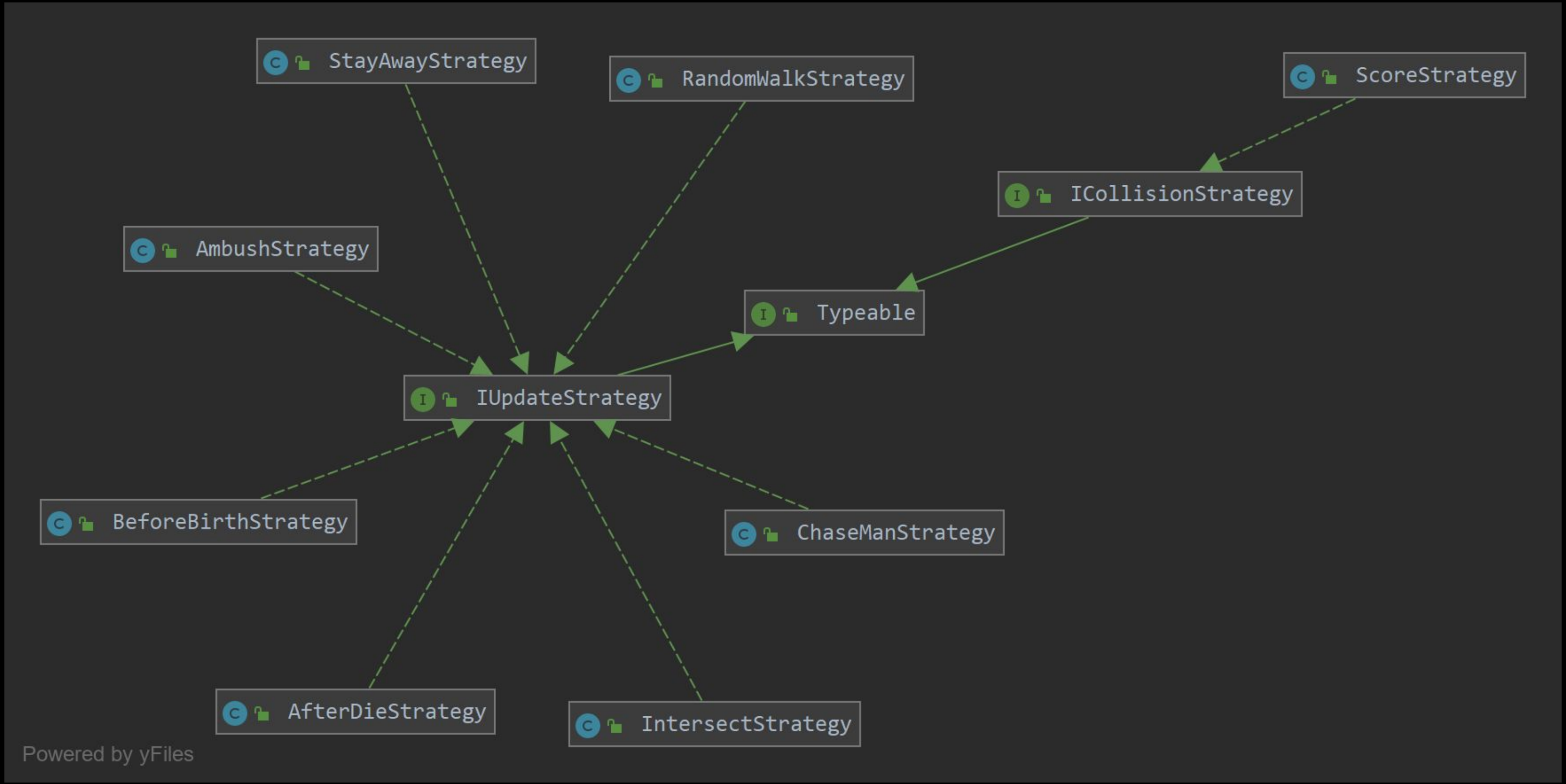
- Map to different Dispatch Adapters according to IDs in the response

Multiple users

- Token keys are used to instantiate multiple Dispatch Adapters.


EventListener
MovingObject
PropertyChangeListener
Typeable
Ghost
Man
Pac
Wall
IUpdateStrategy
ICollisionStrategy
IPacManCmd
PacManController
DispatchAdapter
GameContext
InteractCmd
MoveCmd
Powered by yFiles

UML Diagram


StayAwayStrategy
RandomWalkStrategy
ScoreStrategy
ICollisionStrategy
AmbushStrategy
Typeable
IUpdateStrategy
BeforeBirthStrategy
ChaseManStrategy
AfterDieStrategy
IntersectStrategy
Powered by yFiles

UML Diagram

MVC Design Pattern

Strategy Design Pattern

Command Design Pattern

Singleton Design Pattern

Design Patterns

MVC Design Pattern

Model

- DispatchAdaptor…

View

- view.js

Controller

- PacManController.java

Strategy Design Pattern

MovingObject

- Move ghost and pacman with MovingObject’s move method, it manages movement information

IUpdateStrategy

- decides what the ghost should do

ICollisionStrategy

- decides what should happen if pac-dots and ghost collide with pacman

Command Design Pattern

IPacManCmd

InteractCmd

- tells all the object with IInteractStrategy to perform interaction

MoveCmd

- tells the ghost to move according to its IUpdateStrategy

Singleton Design Pattern

- ScoreStrategy
- AfterDieStrategy
- AmbushStrategy
- BeforeBirthStrategy
- ChaseManStrategy
- IntersectStrategy
- RandomWalkStrategy

Model Implementation

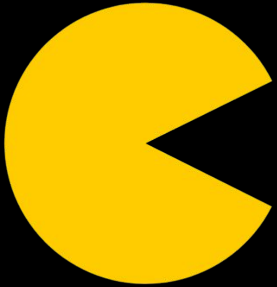
Pacman

Ghost

Fruit

Game Score and Level

Pacman



MovingObject

Collision detection

- Binary search

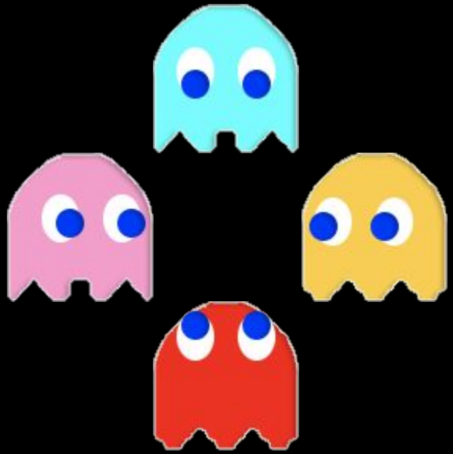
Interaction

Eat energizer

3 lives

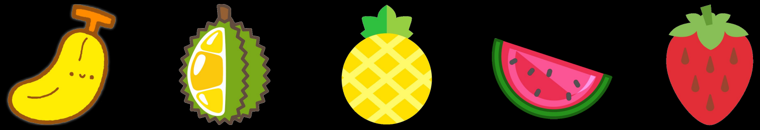
Ghost

Preprocess all the shortest paths using BFS algorithm, which will be utilized later.



- Random Walk Strategy
- Chase Man Strategy
- Ambush Strategy
- Intersect Strategy

Fruit



Counter

Update

Add

Remove

Game Score
Game Level

- Score
- Highest Score
- Level
- Ghost velocity

View Implementation

Paint according to data from backend

Pac-Man

- Walk animation
- Death animation

Ghosts

- Walk animation
- Eyes directions
- Death animation

Buttons and information board

Map selection and overlay map editor

To Meet Other Requirements

Comments

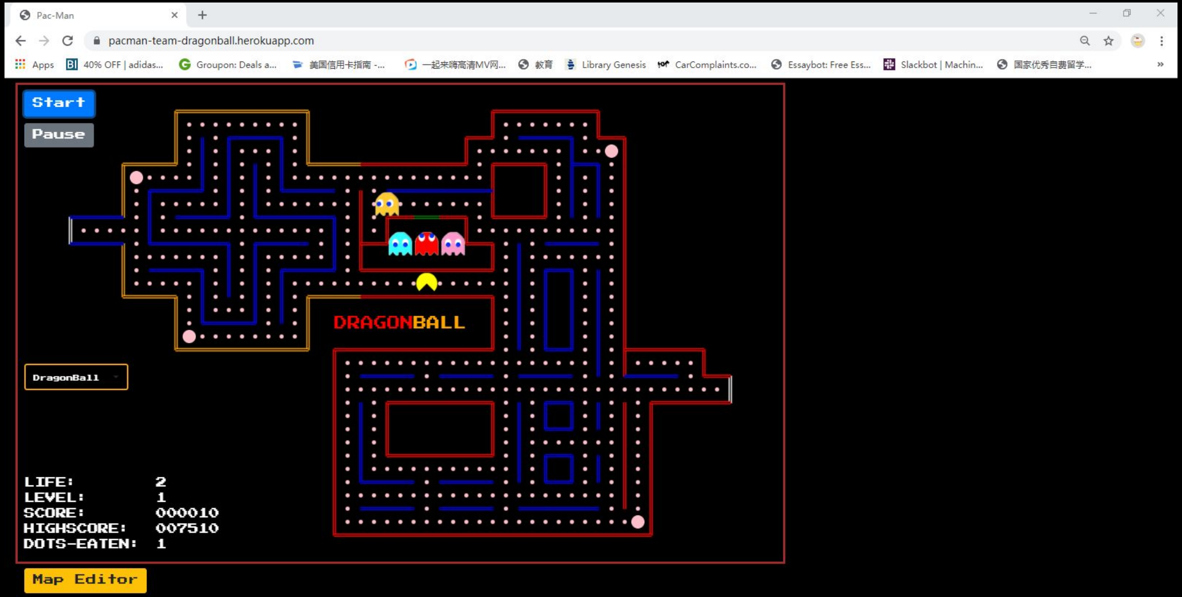
- For all classes and member functions

Unit Test

- Test cases for all possible states of the game
- Code coverage of 93%

Host on Heroku

- Host default map profiles on S3
- Test to ensure it runs well online



```
LIFE:        2
LEVEL:       1
SCORE:       000010
HIGHSCORE:   007510
DOTS-EATEN:  1
```

Demo

Thank you.