Castle Defense Game Design Document

Junseo Yang

Computer Programmer/Analyst OC, Conestoga College

PROG2370 - Game Programming with Data Structures

Sabbir Ahmed

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Castle Defense is a game that displays 2D graphics, runs on Windows 10, comes with simple castle icon, and one click installer.

Description & features of the game

Purpose

You need to defense a Castle with your archer from the invasion of enemies.

Starting Game

In the beginning of the game, you need to enter a unique player name that you are going to use for the high score record.

Play Sound and Music

After you enter a player name, the background music Eldon - Pink cheeks will be played and continuously repeated. Each time you shoot an arrow or use a bomb, the sound effect of arrow shooting sound and bomb explosion sound will be played.

Screens

In a game you have 5 screens, Start screen with menu, Game screen, Help, High Score, and Credit. You can select menu by using keyboard arrow keys and hit enter. In the help scene, you can see the description how to play the game. In the Credit Scene

Game Control

While you are playing game, you can control your archer to aim and shoot arrows by mouse and use bombs by keyboard button B. You can pause while you are playing game with keyboard button P. You can go back to the start screen by ESC key from Game, Help, High Score, Credit Screen. You can quit the game by select Quit menu and hit enter.

Level and Score System

Your level start with level 1. Each time you kill an enemy by shooting an arrow, your score increases by one. If you collect 20 points at each level, you can clear a level and move on to the next level.

Save Game & Load Game

Player name, level, and score are saved automatically to the file CastleDefenseSave.txt. You will start with Level 1 and Score 0, and you can check on the high score screen if you are the first player. You can stop playing game anytime you want with press ESC. But, if you want to keep playing with your saved level and score, you need to hit enter on the load game. If you hit the enter on the start new game or lose a game and start a new game, then the saved level and score will be initialized and overridden. If you lost the previous game, you can't load game and a new game will start.

High Score Screen

You can see the top 5 high scores in the High Score Screen. If game save file is contaminated, it will be deleted and exit the game.

Credit Screen

You can see the game creator of castle defense.

Archer & Arrow

Archer's shooting speed and arrow speed will be increased according to the level.

Enemies

In each level, enemies are generated randomly according to the level you are in. In level 1, an enemy 'red bat' will come out. In level 2, an enemy 'Samurai' will be added. In level 3, an enemy 'Normal Zombie' will be added. In level 4, an enemy 'Mad Zombie' will be added. Enemies moving speed will be increased randomly according to the level you are in.

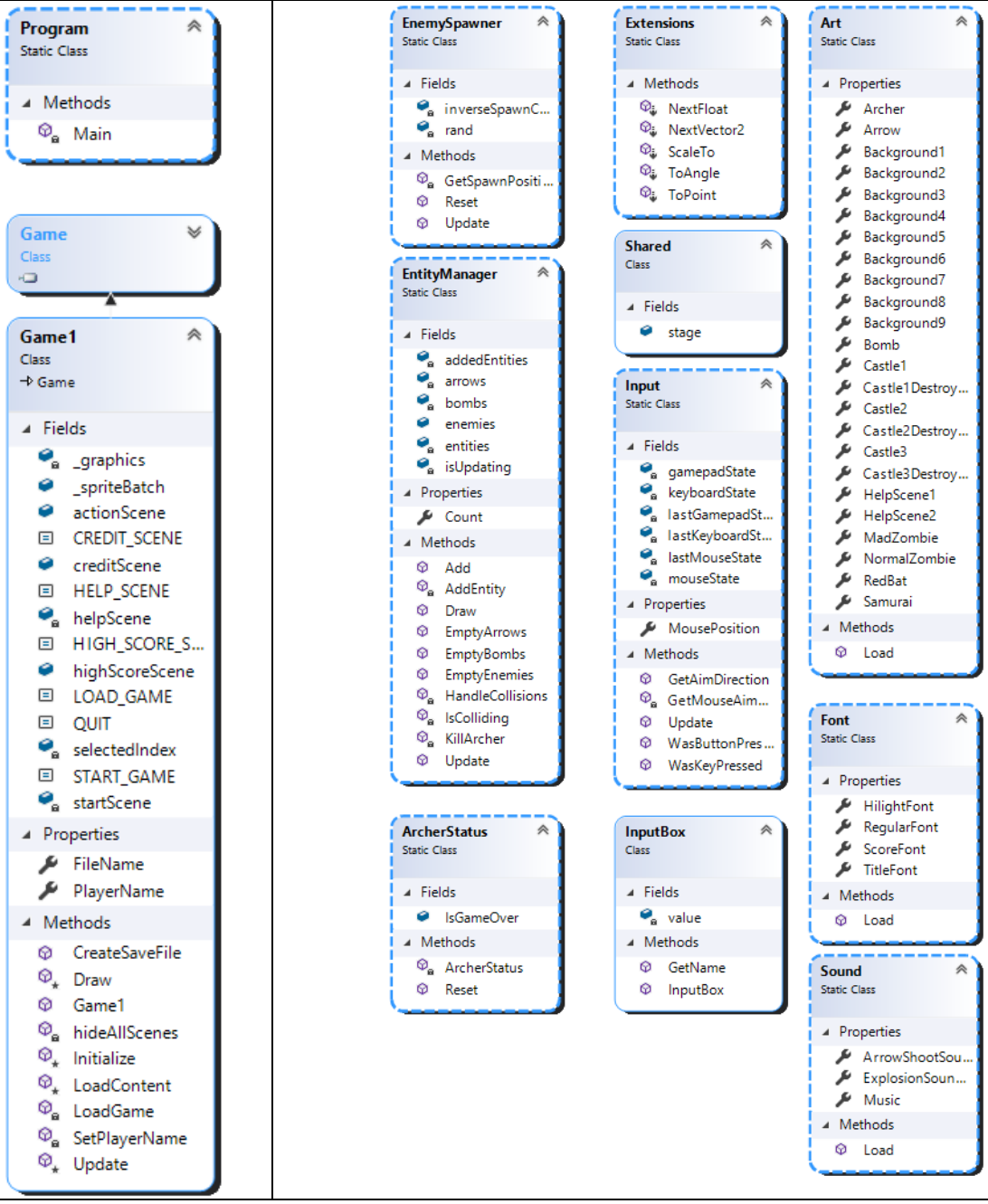
Red Bat	Samurai	Normal Zombie	Mad Zombie

Special Feature – Bomb

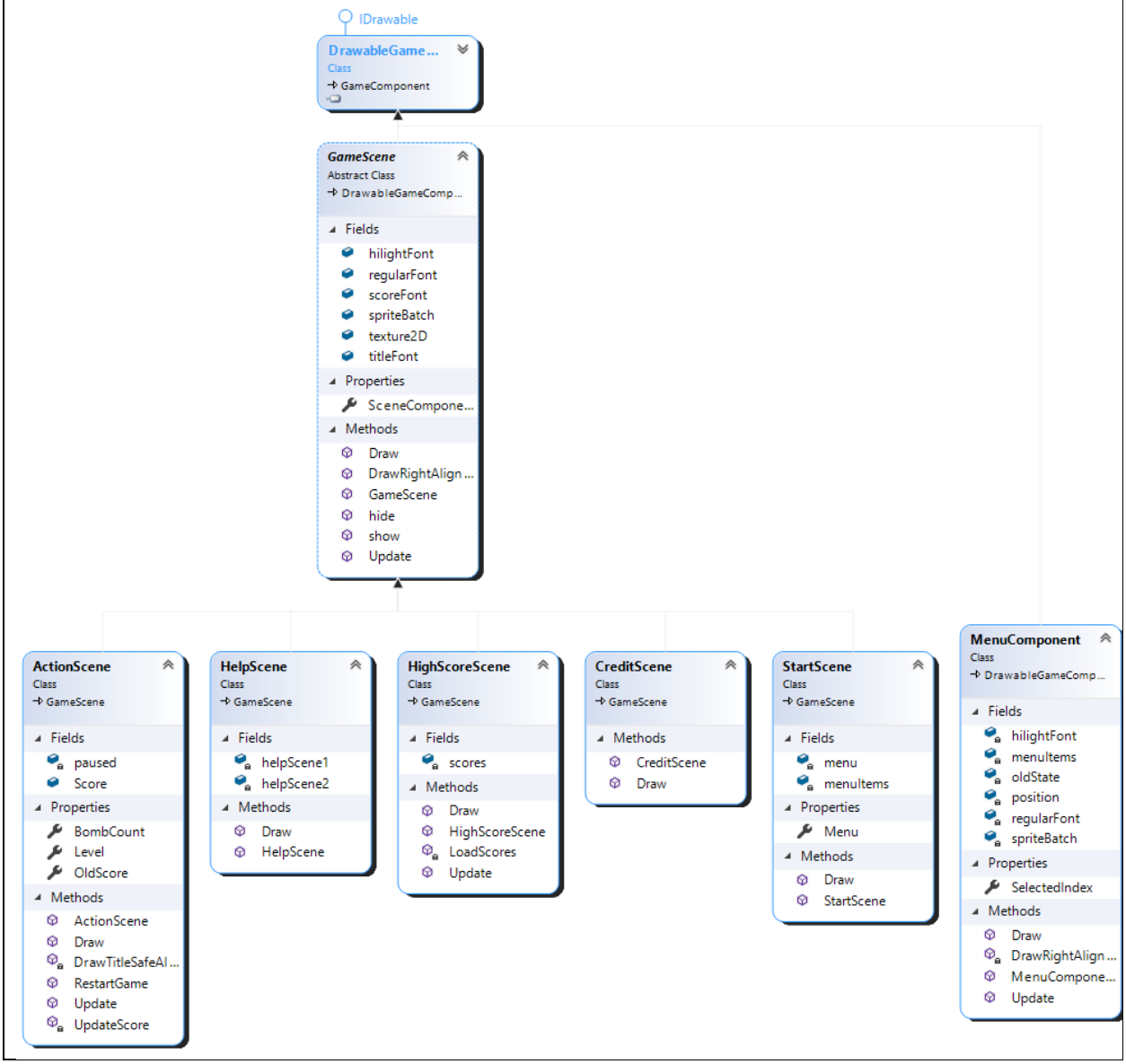
The number of Bomb you can use depends on the level. In the level 1~4, you can't use bomb. If you clear 5 levels or more levels, you can get certain chance of using bomb so that you can clear the enemies on the field, but the score will not be increased.

Class Diagram

Program & Game and Game1	Manager Classes, Extensions, and Static Resources



Scenes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scoreFont
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Methods
Draw
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GameScene
hide
show
Update
ActionScene
Class
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Fields
paused
Score
Properties
BombCount
Level
OldScore
Methods
ActionScene
Draw
DrawTitleSafeAl...
RestartGame
Update
UpdateScore
HelpScene
Class
GameScene
Fields
helpScene1
helpScene2
Methods
Draw
HelpScene
HighScoreScene
Class
GameScene
Fields
scores
Methods
Draw
HighScoreScene
LoadScores
Update
CreditScene
Class
GameScene
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StartScene
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menu
menuItems
Properties
Menu
Methods
Draw
StartScene
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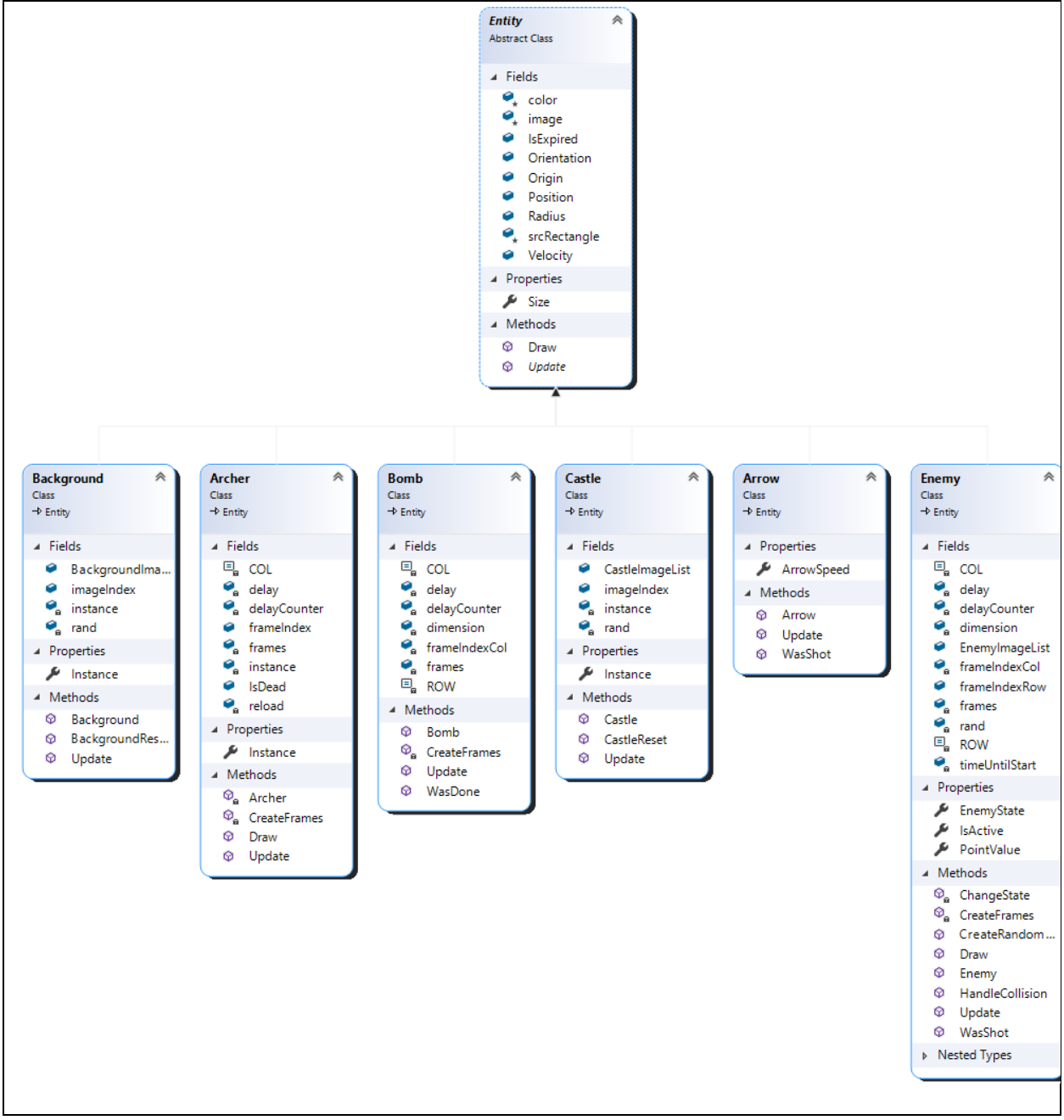
position
regularFont
spriteBatch
Properties
SelectedIndex
Methods
Draw
DrawRightAlign...
MenuCompone...
Update

Entity


Entity
Abstract Class
Fields
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IsExpired
Orientation
Origin
Position
Radius
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Properties
Size
Methods
Draw
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Background
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Entity
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Background
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Archer
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IsDead
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Methods
Archer
CreateFrames
Draw
Update
Bomb
Class
Entity
Fields
COL
delay
delayCounter
dimension
frameIndexCol
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Methods
Bomb
CreateFrames
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WasDone
Castle
Class
Entity
Fields
CastleImageList
imageIndex
instance
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Properties
Instance
Methods
Castle
CastleReset
Update
Arrow
Class
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Properties
ArrowSpeed
Methods
Arrow
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WasShot
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COL
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dimension
EnemyImageList
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frames
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ROW
timeUntilStart
Properties
EnemyState
IsActive
PointValue
Methods
ChangeState
CreateFrames
CreateRandom...
Draw
Enemy
HandleCollision
Update
WasShot
Nested Types

References

Image Resources

https://craftpix.net/

http://opengameart.org

Sound Resources

https://www.freesoundeffects.com/free-sounds/explosion-10070/

Icon Resources

https://www.pngrepo.com/

Online Material

https://www.youtube.com/watch?v=nLExEJJqA2s&ab_channel=LuckyGoodrich