Barnyard Defenders

Overview:

  Barnyard Defenders is a farm themed rouge-lite tower defense hybrid game. The main objective is to harness the unique abilities of your various farm animals and crop styled weaponry, to defend a barn from invading enemies. This is complimented by a randomized choice upgrade system, where players select from a set of randomly presented upgrades, each drawn from a vast pool of available upgrades. There are 3 waves, a wave of short range enemies, a range of long range enemies, and a final boss with both short and long range attacks.

  The core gameplay structure is paired alongside various key features. Noteworthy additions include the ability to adjust difficulty through various pickers, in-game currency shop notifications showcasing limited-time deals, and local and cloud storage. All of these elements are seamlessly integrated into a clear navigation system that guides players between their statistics, the main game, the cosmetic store, and the upgrade screens.

Group Members:

- Olly Love - gituser1034
- Chris Chen - ChrisKHChen
- .Mohammad-mohammad0104,
- Omed Zerghune

Responsibilities:

  Proposal:

  Brainstorm: Everyone

  Formal Writeup of Notes: Chris

  Writeup Revisions: Chris, Olly

  Code Design UML: Mohammad, Olly

  UML Revisions: Everyone

  Sketch: Chris, Omed

  Sketch Feedback: Everyone

  Coding:

  Defenders + enemies: Olly, Mohammad

  Attack Class: Olly

  Main game layout: Chris

Screen setup: Omed

Login form: Mohammad

Settings: Omed

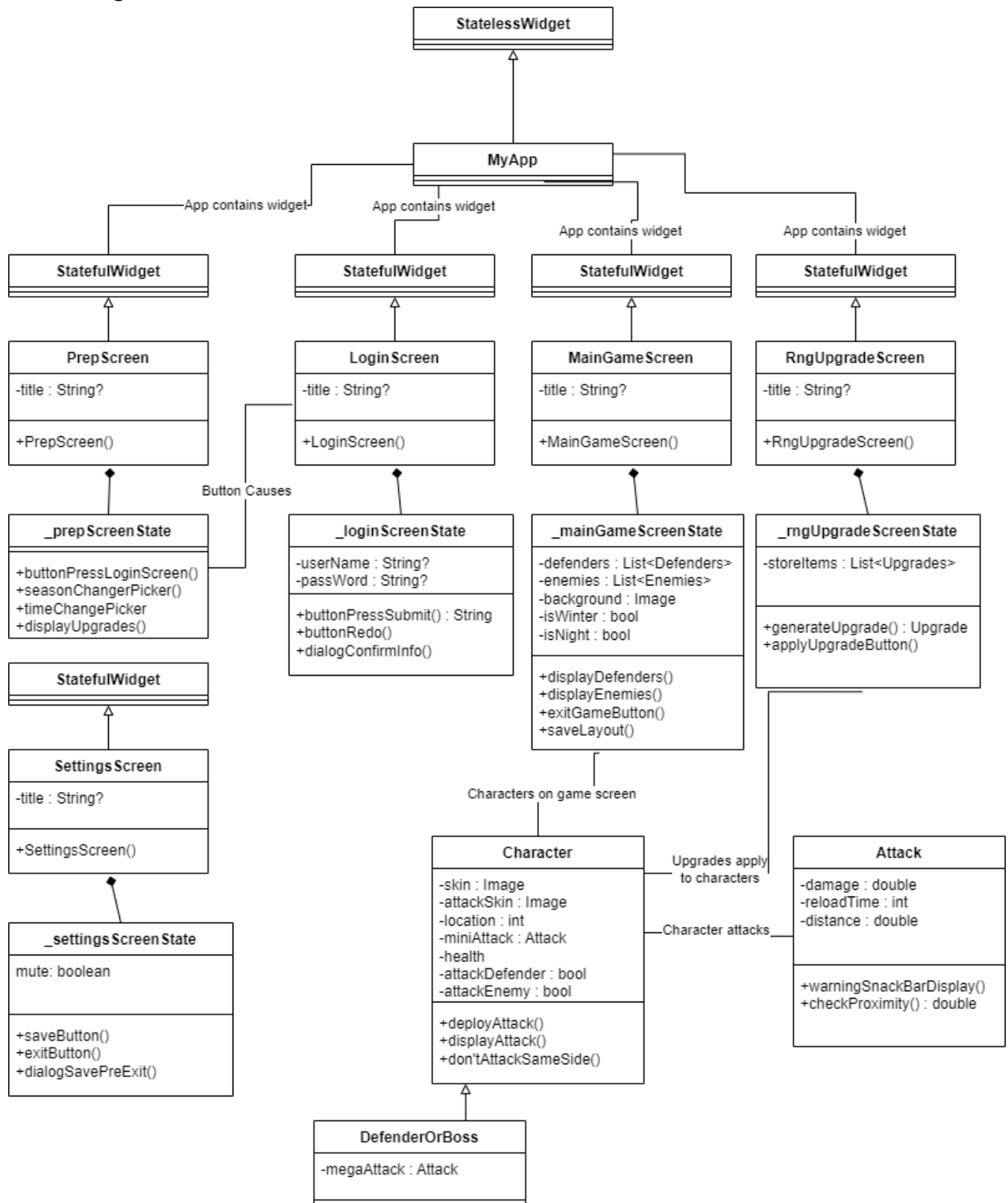**First upgrade prep screen/shop:** Chris, Olly

Rng upgrade system: Chris

Features and Functional Requirements:

- **Multiple Screens:**
  - A simple navigation system that streamlines access to different parts of the game. Starting at a login screen, the user is then taken to the tower defense map screen. Additional screens are available from there, including the store, the user's game account information, the settings, and an rng upgrade screen that enhances various aspects of the tower defense portion of the game.

- **Pickers:**
  - Pickers allow the user to change the time and date that the game will play in. Depending on the choices, the game's difficulty will alter accordingly.
    - Time Picker: The enemies become tankier the closer it is to midnight.
    - Date Picker: The enemies are tankier in the winter, regenerate health in the spring, faster in the summer, and are default in the fall.

- **Snack Bars:**
  - Snack bars allow the game to alert and inform the user that specific actions are unable to be performed at that time. This comes in the form of not having enough currency to purchase an item from the upgrade screens or the cosmetic store, as well as tapping on an animal's ability when it is still on cooldown.

- **Notifications:**
  - Notifications will be used to inform the user about ongoing events in the game, as well as acting as a reminder for the user to perform specific actions. A notification will be sent under any of the following conditions: a wave has been started, a deal is in the shop.

- **Local Storage:**
  - Local storage allows the game to store data directly on the user's device. In addition to saving the game's progress, the user's preferences in volume and notifications are locally stored.

- **Cloud Storage:**

- ○ Cloud storage allows the game to store data remotely, via the internet. This allows the user to synchronize their game data across multiple devices, and can also act as a backup for their progress and data. An account is required for cloud storage.
- **Leaderboards:**
  - ○ Leaderboards encourage competition among users. When the user has been defeated, a score that is calculated based on difficulty, waves survived, and quality of upgrades taken.
- **Challenges:**
  - ○ Challenges are a way to introduce users to towers, by locking completion behind number of takedowns by a specific tower, under specific difficulty sliders. More advanced challenges will also be implemented, which encourages the user to play under conditions that may be outside of their comfort zone.

Code Design:

```
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                            │   StatelessWidget    │
                            ├─────────────────────┤
                            ├─────────────────────┤
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                            │        MyApp         │
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                            ├─────────────────────┤
                            └─────────────────────┘
```

App contains widget — App contains widget — App contains widget — App contains widget

StatefulWidget	StatefulWidget	StatefulWidget	StatefulWidget

△ △ △ △

PrepScreen
-title : String?

+PrepScreen()

LoginScreen
-title : String?

+LoginScreen()

MainGameScreen
-title : String?

+MainGameScreen()

RngUpgradeScreen
-title : String?

+RngUpgradeScreen()

_prepScreenState
+buttonPressLoginScreen()
+seasonChangerPicker()
+timeChangePicker
+displayUpgrades()

Button Causes

_loginScreenState
-userName : String?
-passWord : String?

+buttonPressSubmit() : String
+buttonRedo()
+dialogConfirmInfo()

_mainGameScreenState
-defenders : List<Defenders>
-enemies : List<Enemies>
-background : Image
-isWinter : bool
-isNight : bool

+displayDefenders()
+displayEnemies()
+exitGameButton()
+saveLayout()

_rngUpgradeScreenState
-storeItems : List<Upgrades>

+generateUpgrade() : Upgrade
+applyUpgradeButton()

StatefulWidget

△

SettingsScreen
-title : String?

+SettingsScreen()

_settingsScreenState
mute : boolean

+saveButton()
+exitButton()
+dialogSavePreExit()

Characters on game screen

Character
-skin : Image
-attackSkin : Image
-location : int
-miniAttack : Attack
-health
-attackDefender : bool
-attackEnemy : bool

+deployAttack()
+displayAttack()
+don'tAttackSameSide()

Upgrades apply to characters

Character attacks

Attack
-damage : double
-reloadTime : int
-distance : double

+warningSnackBarDisplay()
+checkProximity() : double

DefenderOrBoss
-megaAttack : Attack

User Interface:

Randomized Choice Based Upgrade

Choose an Upgrade

Upgrade Name 1	Upgrade Name 1	Upgrade Name 1
Upgrade Description 1	Upgrade Description 1	Upgrade Description 1

Accept   Skip Selection

Tower Defense Map

Small Tower

Large Tower

Small Tower

Small Tower

Small Tower

Large Tower

Large Tower

Artillery Tower

Artillery Tower

Small Tower

Small Tower

Large Tower

Large Tower

Barn
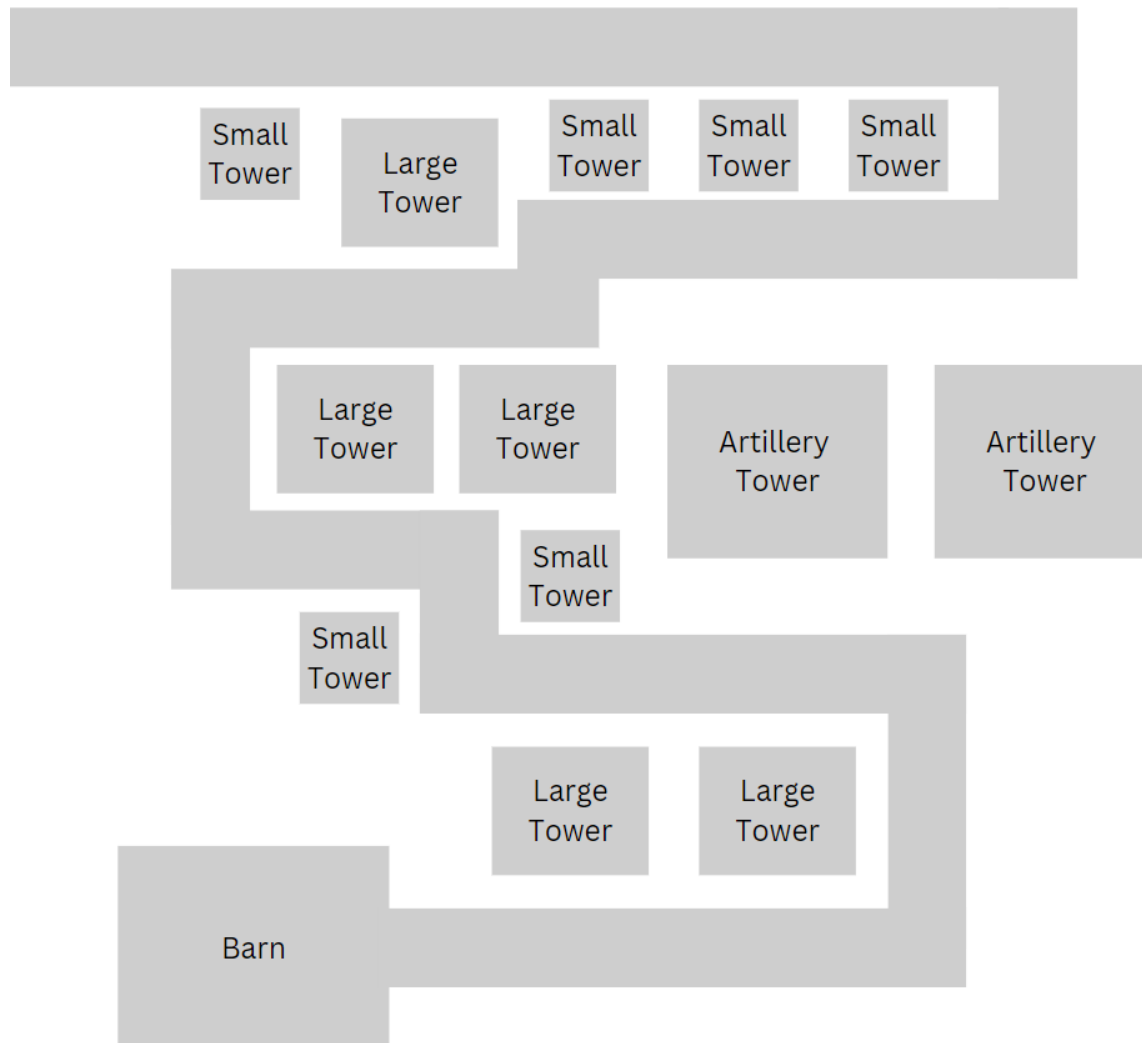
Settings

Volume: ───────────────────

Notifications: Yes   No

Account

| Account | Upgrades | Defend | Shop | Settings |

User Banner

Name:

Games Played:

Games Won:

Highest Round:

Highest Score:

View
Leaderboard

Log Out

Upgrades

| Upgrade | Upgrade | Upgrade | Upgrade |

| Upgrade | Upgrade | Upgrade |

| Upgrade | Upgrade |

| Upgrade |
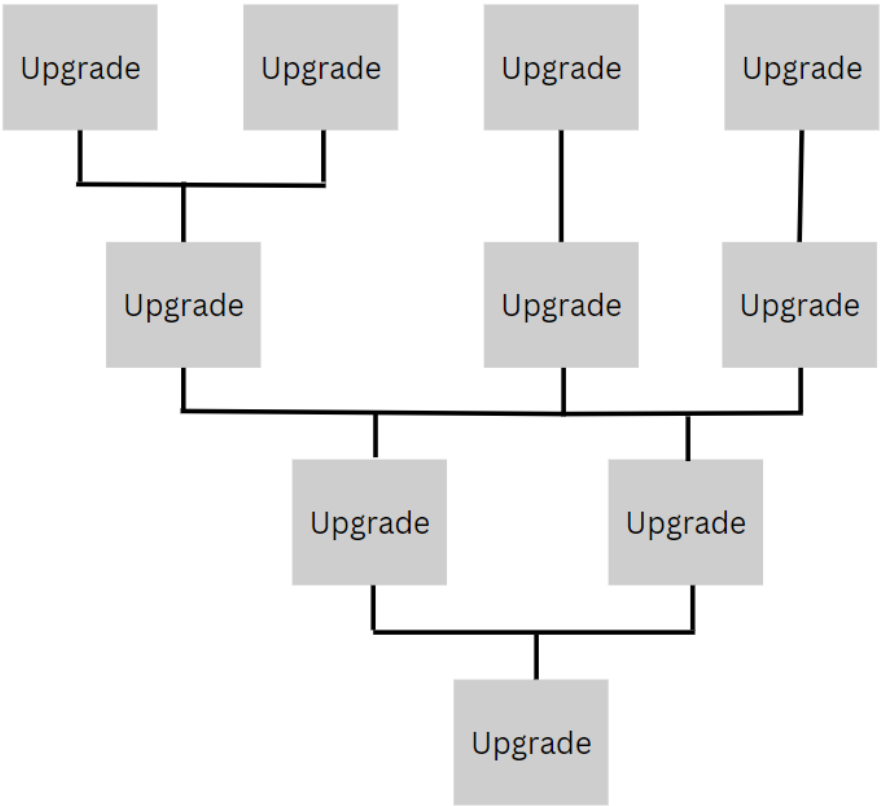
Shop

Account	Upgrades	Defend	Shop	Settings

Skins

Skin	Skin	Skin

Cost: Cost: Cost:
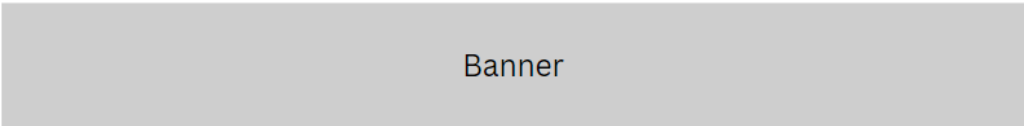
Banners

Banner

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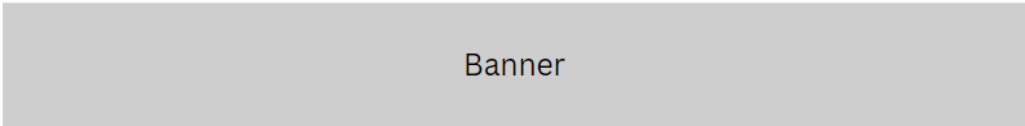
Banner

Cost:

Login

Barnyard Defenders

Username: _____

Password: _____