Alien Invasion Pygame Master Document

# Abstract

In Alien Invasion, the player controls a rocket ship that appears at the bottom center of the screen.  
The player can move the ship right and left using the arrow keys and shoot bullets using the spacebar.  
When the game begins, a fleet of aliens fills the sky and moves across and down the screen.  
The player shoots and destroys the aliens.  
If the player shoots all the aliens, a new fleet appears that moves faster than the previous fleet.  
If any alien hits the player’s ship or reaches the bottom of the screen, the player loses a ship.  
If the player loses three ships, the game ends.

# 1.0 Directory Hierarchy & Structure

XXX

# 2.0 Game flow

XXX

# 3.0 Functions

XXX

# 4.0 Objects

This chapter includes all the objects involved throughout the whole Alien Invasion project

## 4.1 Rocket Ship

A rocket ship is an object controllable by the player. It has the ability to move left or right and shoot bullets that deals damage to aliens.

### 4.1.1 Structure

A class needs to be created for the object rocket ship, it must be initialized by the conditions as per below:

|  |  |  |
| --- | --- | --- |
| **Class Name** | RocketShip | |
| **Variables** | self.lives = 3 | If the rocket ship is hit by alien’s projectile or any alien has reached the bottom of the screen this variable will be subtracted by 1. This variable represents that the ship has total three lives. |
| **Methods** | ship\_move | To move the ship left or right on the bottom of the sea. |
| ship\_shoot\_bullet | To shoot bullets from the ship. Each bullet has a fixed amount of damage if it hits the aliens. |
| ship\_damage\_taking | If the rocket ship is hit by alien’s projectile or any alien has reached the bottom of the screen, this method shall be invoked and will perform a subtraction on the self.damage variable by 1. |
| ship\_one\_up | If the alien dies and triggers a random life drop, this method shall be invoked and will perform an addition on the self.damage variable by 1. |

## 4.2 Aliens

An alien is an object that will shoot projectile and hit the rocket ship, it must be initialized (spawned) by the conditions as per below:

|  |  |  |
| --- | --- | --- |
| **Class Name** | Alien | |
| **Variables** | self.hp | If the alien is hit by the rocket ship’s projectile, this variable will be subtracted by the projectile’s damage. This variable represents that the alien’s health points.  Different alien can have different hp, making up fleet of strong and weak aliens. |
| **Methods** | alien\_shoot\_bullet | To shoot bullets from the alien. Each bullet has a fixed amount of damage if it hits the aliens. Different aliens can have different amount of damage, making up fleet of strong and weak aliens. |
| ship\_shoot\_bullet | To shoot bullets from the ship. |
| alien\_damage\_taking | If the alien is hit by rocket ship’s projectile, this method shall be invoked and will perform a subtraction on the self.hp variable by the damage of the rocket ship’s projectile. |

# 5.0 Logics

This chapter describes the logics and conditions for the following scenarios:

* Conditions to continue in higher difficulty
* Conditions to win
* Conditions to lose

## 5.1 Conditions to continue in higher difficulty

XXX

## 5.2 Conditions to win

XXX

## 5.3 Conditions to lose

XXX

# 6.0 Data Storing

This chapter describes how to store, what to be stored and where to store the data generated by the game.

## 6.1 What to be stored

High scores will be stored in a dictionary as JSON format.

|  |  |  |  |
| --- | --- | --- | --- |
| **Dictionaries** | **Variables** | **Data Type** | **Description** |
| high\_scores | player\_name | String | Player Name |
| player\_score | Integer | High Score |
| aliens\_killed | Integer | This refers to the number of aliens killed for each playthrough from start to end |
| playtime | String | This refers to the timespan for each playthrough from start to end |

## 6.2 Where to store

*Directory pending update…*