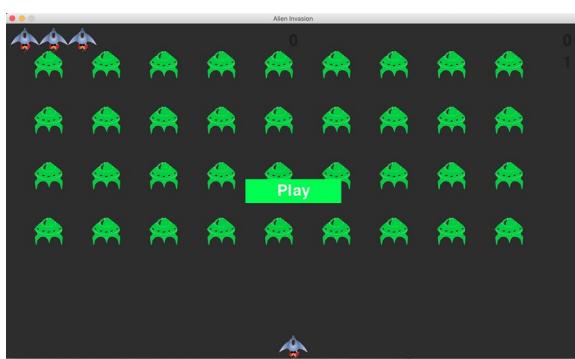


CPSC 386 – Fall 2019
Introduction to Game Design & Production
Project Two: ALIEN INVASIONS

due at beginning of class – 386-01: 25 Sep (W)
386-02: 27 Sep (F)

In this assignment, you will create a simplified version of the classic game Space Invaders, based on the first project (Alien Invasions) from Eric Matthes's book CRASH COURSE in PYTHON. This project is harder than it looks: it has the following features:



- A ship that moves and shoots lasers.
 - A fleet of aliens that is trying to collide with the ship and destroy it.
 - Multiple copies of ships so the player can have more than one chance to win.
 - Multiple levels, with the speed (and point value) of the aliens increasing with each new level.
 - A scoreboard to track of your score, and your high score.
 - A menu button that allows the game to start, or to play again if you lose, or just like winning again.

Object-oriented python classes to model the aliens, the ship, the lasers, the scoreboard, and the game settings. Python code that is separated into multiple files and functions, to give practice in writing more complex Python. A linter to help PEP-8 correct Python code, and a debugger that catches run-time errors.



Although most of the code is provided as a scaffold for our next project (Space Invaders), you are free to add your own touches to your project. Be warned, there is much more code than the projects we have done so far. It will take quite a while to write this project. Do not wait until the last minute to try and get it written, debugged, and tested.

The screenshot shows the PyCharm IDE interface with the following details:

- Project Tree:** Shows files like alien_invaders, alien.py, button.py, game_functions.py, ship.py, settings.py, and laser.py.
- Code Editor:** The file `laser.py` is open, displaying Python code for a `Laser` class.
- Code Content:**

```
import pygame
from pygame.sprite import Sprite

class Laser(Sprite):
    def __init__(self, settings, screen, ship):
        super().__init__()
        self.screen = screen
        self.width = settings.laser_width
        self.height = settings.laser_height
        self.color = settings.laser_color
        self.speed = settings.laser_speed

        self.rect = pygame.Rect(0, 0, self.width, self.height)
        self.rect.centerx = ship.rect.centerx
        self.rect.top = ship.rect.top

        self.y = float(self.rect.y)

    def update(self):
        self.y -= self.speed
        self.rect.y = self.y

    def draw_laser(self):
        pygame.draw.rect(self.screen, self.color, self.rect)
```
- Status Bar:** Shows "Laser : __init__()
- Bottom Navigation:** Run, Python Console, Terminal, Run, Debug, TODO.

Here is a description of the project...

Use Python and PyGame to build the Alien Invasions application from the book Python Crash Course, by Eric Matthes. The code is developed in three chapters (ch. 12, 13, and 14) of the book.

Chapter 12 installs Pygame, creates the project, and adds the ship image, programs it to move, then adds bullets (or lasers if you prefer) to shoot at the aliens.

Chapter 13 adds aliens to the game: first one alien, then a row of them, and then a fleet of aliens. It then adds the ability for the aliens to move as a group, then change directions and drop down when they hit the edge of the screen. Laser/alien collisions, and collisions between the aliens and the ship are then added, causing aliens to be blown up, or the ship to be destroyed.

Chapter 14 adds a play button to start the game, hides the mouse, and creates a scoreboard that shows the score, the level, the high score, and the number of ships that remain.

As you develop the code, it will be refactored several times to add more classes, more class methods, more files, more functions, and more function arguments. Failing to match the arguments passed to the methods or functions will cause the program to crash.

Students who wish to change the icons for the ship or the aliens may do so, for example, using Gimp, Inkscape, or your favorite graphics editor (available online for free).

Note: the code used in this project will be the basis for a future Space Invaders project, with multiple types of aliens and ufo's, aliens that shoot back, bunkers to hide behind, pixel manipulations that destroy the bunkers bit by bit (by both the aliens and the ship), background music and sound effects.

Submission

Turn in the code for this homework by uploading all of the Python source files you created, the images directory, and the sounds directory to a single public repository on GitHub. While you may discuss this homework assignment with other students. Work you submit must have been completed on your own.

Push the contents of your project to a new GitHub repository using a git client. Do not submit files using drag-and- drop onto the repository web page, and do not push this assignment to the same repository as your previous homework assignments.

To complete your submission, print the following sheet, fill out the spaces below, and submit it to the professor in class by the deadline. Failure to follow the instructions exactly will incur a **10%** penalty on the grade for this assignment.

CPSC 386 Project One: Pong w/o walls:
 due 25 Sep (-01), 27 Sep (-02) at beginning of class

Your name Lambert Liu

Repository: <https://github.com/OsirisLambert/CPSC386---Proj2---AlienInvasion.git>

Finished	Not Finished	Verify each of the following items and place a checkmark in the correct column. Each item incorrectly marked will incur a 5% penalty on the assignment's grade.
<input type="checkbox"/>	<input type="checkbox"/>	The Alien Invaders screen has layout shown on first page of this project specification, with a high score, score, multiple ships, a fleet of aliens, lasers that can be fired from the ship.
<input type="checkbox"/>	<input type="checkbox"/>	A fleet of aliens moves together back and forth, coming closer to the ship each time they hit the left or right wall.
<input type="checkbox"/>	<input type="checkbox"/>	The ship at the bottom can be moved left or right, and can fire lasers at the aliens. Each time a laser hits an alien, it disappears and the player's score is incremented.
<input type="checkbox"/>	<input type="checkbox"/>	If all of the aliens are destroyed, a new level begins, with the aliens moving faster, and their point value is increased.
<input type="checkbox"/>	<input type="checkbox"/>	A Play button begins the game (when the mouse clicks on it), and restarts the game if the player wants to play again.
<input type="checkbox"/>	<input type="checkbox"/>	The Python code is object-oriented, with classes being created for the Ship, the Laser, the Alien, the Scoreboard, and the Settings.
<input type="checkbox"/>	<input type="checkbox"/>	No issues are shown in PyCharm (all source code screens show a green checkmark at the top right hand corner).
<input type="checkbox"/>	<input type="checkbox"/>	Image files edited in an image editor (such as Gimp or Inkscape), or downloaded and attributed to their source.
<input type="checkbox"/>	<input type="checkbox"/>	Sound files edited in an audio editor (such as Audacity), or are downloaded and attributed to their source.
<input type="checkbox"/>	<input type="checkbox"/>	Project directory pushed to new GitHub repository listed above
<input type="checkbox"/>	<input type="checkbox"/>	Project directory has been pushed using a GitHub client, not by manually dragging-and-dropping files onto the GitHub web page.
Comments:		