

```
import pygame
from pygame import mixer
import random

# Initialize pygame and mixer
pygame.mixer.pre_init(44100, -16, 2, 512)
mixer.init()
pygame.init()

# Define fps
clock = pygame.time.Clock()
fps = 60

# Set up the screen dimensions
screen_width = 600
screen_height = 800
screen = pygame.display.set_mode((screen_width, screen_height))
pygame.display.set_caption('Space Invaders')

# Define fonts
font30 = pygame.font.SysFont('Constantia', 30)
font40 = pygame.font.SysFont('Constantia', 40)

# Load sounds
explosion_fx = pygame.mixer.Sound("img_explosion.wav") # Give Path
explosion_fx.set_volume(0.25)

explosion2_fx = pygame.mixer.Sound("C:/Users/eagle/Downloads/explosion2.wav") # Give Path
```

```
explosion2_fx.set_volume(0.25)
```

```
laser_fx = pygame.mixer.Sound("laser.wav") # Give Path
```

```
laser_fx.set_volume(0.25)
```

```
# Define game variables
```

```
rows = 5
```

```
cols = 5
```

```
alien_cooldown = 1000 # Alien bullet cooldown in milliseconds
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```
last_alien_shot = pygame.time.get_ticks()
```

```
countdown = 3
```

```
last_count = pygame.time.get_ticks()
```

```
game_over = 0 # 0: no game over, 1: player has won, -1: player has lost
```

```
# Define colors
```

```
red = (255, 0, 0)
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```
green = (0, 255, 0)
```

```
white = (255, 255, 255)
```

```
# Load background image
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```
bg = pygame.image.load("bg.png") # Give Path
```

```
def draw_bg():
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```
    screen.blit(bg, (0, 0))
```

```
# Function for creating text
```

```
def draw_text(text, font, text_col, x, y):
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```
    img = font.render(text, True, text_col)
```

```
    screen.blit(img, (x, y))
```

```
# Create spaceship class
```

```

class Spaceship(pygame.sprite.Sprite):
    def __init__(self, x, y, health):
        super().__init__()
        self.image = pygame.image.load("spaceship.png") # Give Path
        self.rect = self.image.get_rect()
        self.rect.center = [x, y]
        self.health_start = health
        self.health_remaining = health
        self.last_shot = pygame.time.get_ticks()

    def update(self):
        global game_over
        if self.health_remaining <= 0:
            game_over = -1
            return

        speed = 8
        cooldown = 500 # milliseconds

        key = pygame.key.get_pressed()
        if key[pygame.K_LEFT] and self.rect.left > 0:
            self.rect.x -= speed
        if key[pygame.K_RIGHT] and self.rect.right < screen_width:
            self.rect.x += speed

        time_now = pygame.time.get_ticks()
        if key[pygame.K_SPACE] and time_now - self.last_shot > cooldown:
            laser_fx.play()
            bullet = Bullets(self.rect.centerx, self.rect.top)
            bullet_group.add(bullet)
            self.last_shot = time_now

```

```

self.mask = pygame.mask.from_surface(self.image)

pygame.draw.rect(screen, red, (self.rect.x, (self.rect.bottom + 10), self.rect.width, 15))
if self.health_remaining > 0:
    pygame.draw.rect(screen, green, (self.rect.x, (self.rect.bottom + 10), int(self.rect.width *
(self.health_remaining / self.health_start)), 15))

class Bullets(pygame.sprite.Sprite):
    def __init__(self, x, y):
        super().__init__()
        self.image = pygame.image.load("bullet.png") # Give Path
        self.rect = self.image.get_rect()
        self.rect.center = [x, y]

    def update(self):
        self.rect.y -= 5
        if self.rect.bottom < 0:
            self.kill()
        if pygame.sprite.spritecollide(self, alien_group, True):
            self.kill()
            explosion_fx.play()
            explosion = Explosion(self.rect.centerx, self.rect.centery, 2)
            explosion_group.add(explosion)

class Aliens(pygame.sprite.Sprite):
    def __init__(self, x, y):
        super().__init__()
        self.image = pygame.image.load("C:/Users/eagle/Downloads/alien" + str(random.randint(1, 5)) +
".png")
        self.rect = self.image.get_rect()
        self.rect.center = [x, y]

```

```
self.move_counter = 0  
self.move_direction = 1
```

```
def update(self):  
    self.rect.x += self.move_direction  
    self.move_counter += 1  
    if abs(self.move_counter) > 75:  
        self.move_direction *= -1  
        self.move_counter *= self.move_direction
```

```
class Alien_Bullets(pygame.sprite.Sprite):  
    def __init__(self, x, y):  
        super().__init__()   
        self.image = pygame.image.load("alien_bullet.png") # Give Path  
        self.rect = self.image.get_rect()  
        self.rect.center = [x, y]
```

```
def update(self):  
    global game_over  
    self.rect.y += 2  
    if self.rect.top > screen_height:  
        self.kill()  
    if pygame.sprite.spritecollide(self, spaceship_group, False, pygame.sprite.collide_mask):  
        self.kill()  
        explosion2_fx.play()  
        spaceship.health_remaining -= 1  
        explosion = Explosion(self.rect.centerx, self.rect.centery, 1)  
        explosion_group.add(explosion)
```

```
class Explosion(pygame.sprite.Sprite):  
    def __init__(self, x, y, size):
```

```

super().__init__()
self.images = []
for num in range(1, 6):
    try:
        img = pygame.image.load(f"C:/Users/eagle/Downloads/exp{num}.png")
    except FileNotFoundError:
        print(f"Error: The file C:/Users/eagle/Downloads/exp{num}.png does not exist.")
        continue
    if size == 1:
        img = pygame.transform.scale(img, (20, 20))
    elif size == 2:
        img = pygame.transform.scale(img, (40, 40))
    elif size == 3:
        img = pygame.transform.scale(img, (160, 160))
    self.images.append(img)
self.index = 0
self.image = self.images[self.index]
self.rect = self.image.get_rect()
self.rect.center = [x, y]
self.counter = 0

def update(self):
    explosion_speed = 3
    self.counter += 1
    if self.counter >= explosion_speed and self.index < len(self.images) - 1:
        self.counter = 0
        self.index += 1
        self.image = self.images[self.index]

    if self.index >= len(self.images) - 1 and self.counter >= explosion_speed:
        self.kill()

```

```
spaceship_group = pygame.sprite.Group()
bullet_group = pygame.sprite.Group()
alien_group = pygame.sprite.Group()
alien_bullet_group = pygame.sprite.Group()
explosion_group = pygame.sprite.Group()
```

```
def create.aliens():
    for row in range(rows):
        for item in range(cols):
            alien = Aliens(100 + item * 100, 100 + row * 70)
            alien_group.add(alien)
```

```
create.aliens()
```

```
spaceship = Spaceship(int(screen_width / 2), screen_height - 100, 3)
spaceship_group.add(spaceship)
```

```
def reset_game():
    global game_over, countdown, last_count
    spaceship.health_remaining = spaceship.health_start
    bullet_group.empty()
    alien_group.empty()
    alien_bullet_group.empty()
    explosion_group.empty()
    create.aliens()
    game_over = 0
    countdown = 3
    last_count = pygame.time.get_ticks()
```

```
run = True
```

```

while run:

    clock.tick(fps)

    draw_bg()

    if game_over == 0:

        if countdown == 0:

            time_now = pygame.time.get_ticks()

            if time_now - last_alien_shot > alien_cooldown and len(alien_bullet_group) < 5 and
len(alien_group) > 0:

                attacking_alien = random.choice(alien_group.sprites())

                alien_bullet = Alien_Bullets(attacking_alien.rect.centerx, attacking_alien.rect.bottom)

                alien_bullet_group.add(alien_bullet)

                last_alien_shot = time_now

            if len(alien_group) == 0:

                game_over = 1

            spaceship.update()

            bullet_group.update()

            alien_group.update()

            alien_bullet_group.update()

        else:

            draw_text('GET READY!', font40, white, int(screen_width / 2 - 110), int(screen_height / 2 +
50))

            draw_text(str(countdown), font40, white, int(screen_width / 2 - 10), int(screen_height / 2 +
100))

            count_timer = pygame.time.get_ticks()

            if count_timer - last_count > 1000:

                countdown -= 1

                last_count = count_timer

    elif game_over == -1:

```



```
draw_text('GAME OVER!', font40, white, int(screen_width / 2 - 100), int(screen_height / 2))
draw_text('Press R to Restart', font30, white, int(screen_width / 2 - 100), int(screen_height / 2 +
50))
elif game_over == 1:
    draw_text('YOU WIN!', font40, white, int(screen_width / 2 - 100), int(screen_height / 2))
    draw_text('Press R to Restart', font30, white, int(screen_width / 2 - 100), int(screen_height / 2 +
50))
```

```
explosion_group.update()
spaceship_group.draw(screen)
bullet_group.draw(screen)
alien_group.draw(screen)
alien_bullet_group.draw(screen)
explosion_group.draw(screen)
```

```
for event in pygame.event.get():
    if event.type == pygame.QUIT:
        run = False
    if event.type == pygame.KEYDOWN:
        if event.key == pygame.K_r and game_over != 0:
            reset_game()
```

```
pygame.display.update()
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```
pygame.quit()
```