**Main and subroutines**Copy-paste solo whale: <https://github.com/gentimouton/swarch/blob/master/main-and-subroutines/whale.py>

Q1 – Change the color of the pellets, background, borders, and player box. Modify only one subroutine. Which subroutine did you change, and how? (20 points)

**CHANGED TO:**  
 screen.fill((0, 250, 100)) # dark blue

[pygame.draw.rect(screen, (0, 0, 0), b) for b in borders] # # Deep Sky Blue

[pygame.draw.rect(screen, (100, 100, 100-), p) for p in pellets] # pink

pygame.draw.rect(screen, (20, 90, 100), mybox) # Deep Sky Blue

pygame.display.update()--*changed the colors for pellets, background, borders, and player box*

*--only needed to change the color parameters being passed in (subroutine = drawEverything)*

Q2 – Change the control keys: Replace up-left-down-right arrows by WASD. Modify only one subroutine. Which subroutine did you change, and how? (20 points)

**ORIGINAL:**

from pygame.locals import KEYDOWN, QUIT, K\_ESCAPE, K\_UP, K\_DOWN, K\_LEFT, K\_RIGHT

if event.type == KEYDOWN:

key = event.key

if key == K\_ESCAPE:

game\_status = 0

elif key == pygame.K\_UP:

direction = (0, -1)

elif key == pygame.K\_LEFT:

direction = (0, 1)

elif key == pygame.K\_RIGHT:

direction = (-1, 0)

elif key == pygame.K\_DOWN:

direction = (1, 0)

elif key == pygame.K\_SPACE:

paused = not paused*--changed key controls, needed to import K\_w, K\_a, K\_s, and K\_d*

**CHANGED TO:**

from pygame.locals import KEYDOWN, QUIT, K\_ESCAPE, K\_UP, K\_DOWN, K\_LEFT, K\_RIGHT, K\_w, K\_a, K\_s, K\_d

if event.type == KEYDOWN:

key = event.key

if key == K\_ESCAPE:

game\_status = 0

elif key == pygame.K\_w:

direction = (0, -1)

elif key == pygame.K\_s:

direction = (0, 1)

elif key == pygame.K\_a:

direction = (-1, 0)

elif key == pygame.K\_d:

direction = (1, 0)

elif key == pygame.K\_SPACE:

paused = not paused

Q3a – The speed of the player box is currently 50px per second. Make it 100px per second while keeping the frame rate at 50 frames per second. Modify only one subroutine. Which subroutine did you change, and how? (20 points)

**CHANGED TO:**

if event.type == KEYDOWN:

key = event.key

if key == K\_ESCAPE:

game\_status = 0

elif key == pygame.K\_w:

direction = (0, -1)

elif key == pygame.K\_s:

direction = (0, 1)

elif key == pygame.K\_a:

direction = (-1, 0)

elif key == pygame.K\_d:

direction = (1, 0)

elif key == pygame.K\_SPACE:

paused = not paused

Q3b – The movebox and collide subroutines have only one line of code each. They are not very substantial, but they keep box.collidelist and box.move outside of the main loop. Why is it a good idea to keep collidelist and move outside of the main loop? (20 points)

*It abstracts the logic from the game loop (separates pygame from main loop). The logic for collidelist*

*and moveBox could change without having to change the code in the main loop.*

Q4 – Add two obstacles in the middle of the screen. The exact positions do not matter, but keep their thickness at 2px so it is still possible for the player to collect the pellets. The player’s box should die when it collides with a border. Do not create any new subroutine. Modify only one subroutine. Which subroutine did you change, and how? (20 points)

Here is an example:

**CHANGED TO:**

def create\_borders(dims, thickness=2):

w, h = dims

return [pygame.Rect(0, 0, thickness, h),

pygame.Rect(0, 0, w, thickness),

pygame.Rect(w - thickness, 0, thickness, h),

pygame.Rect(0, h - thickness, w, thickness),

pygame.Rect(w-200, h-20, thickness, 50),

pygame.Rect(w - 50, h -100, thickness, 30)]

*--added last two rects*

Q5 – Extra credit: pause the game when the player presses the space key. When the game is paused, resume the game if the player presses the space key again. The game should still exit by pressing the escape key or closing the window, whether the game is paused or not. Modify only the main loop and the process\_input subroutine. Describe your changes. (Hints: half a dozen lines of the main loop, half a dozen lines of process\_input. You may have to change the signature of process\_input). (20 points)