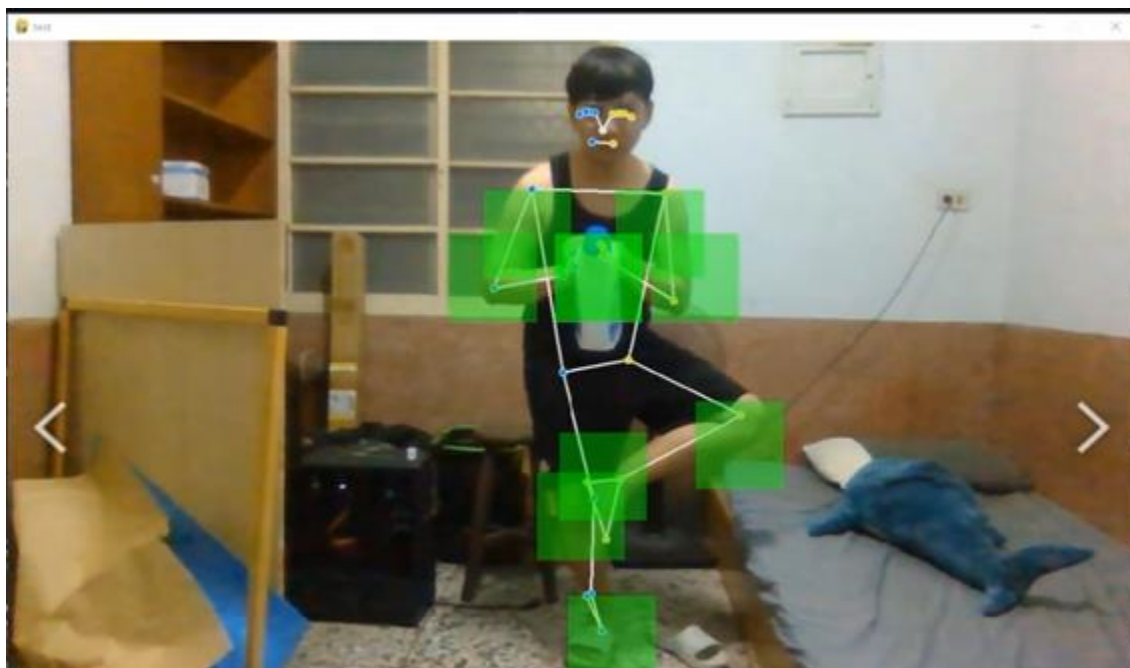


資料結構期末作業 指導老師：謝文川 學生：葉桔良

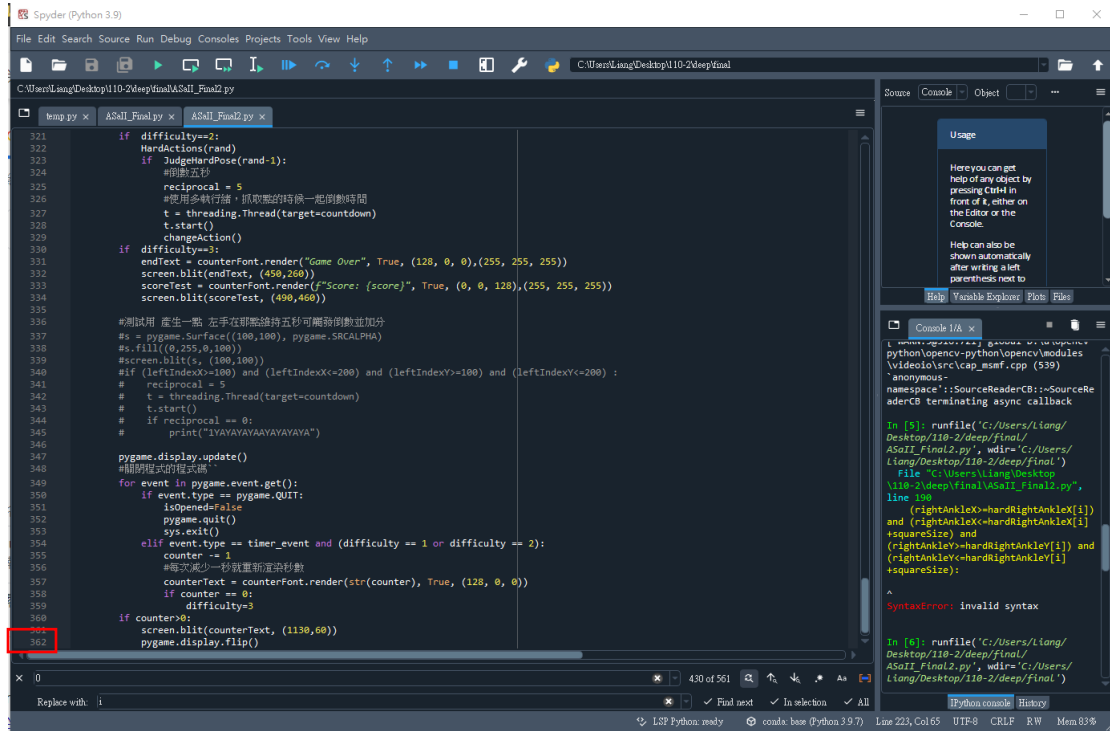
作業說明：



使用相機抓取人體框架，讓人體框架在綠色方框的範圍內，可達到訓練平衡力的效果。

```
1025         changeAction()
1026     if difficulty==3:
1027         endText = counterFont.render("Game Over", True, (128, 0, 0),(255, 255, 255))
1028         screen.blit(endText, (450,260))
1029         scoreTest = counterFont.render(f"Score: {score}", True, (0, 0, 128),(255, 255, 255))
1030         screen.blit(scoreTest, (490,460))
1031
1032     #測試用 產生一點 左手在那點維持五秒可觸發倒數並加分
1033     # s = pygame.Surface((100,100), pygame.SRCALPHA)
1034     # s.fill((0,255,0,100))
1035     # screen.blit(s, (100,100))
1036     #if (leftIndexX>=100 and (leftIndexX<=200 and (leftIndexY>=100 and (leftIndexY<=200) :
1037     #     reciprocal = 5
1038     #     t = threading.Thread(target=countdown)
1039     #     t.start()
1040     #     if reciprocal == 0:
1041     #         print("1YAYAYAYAYAYAYAYA")
1042
1043     pygame.display.update()
1044     #關閉程式的程式碼~`
1045     for event in pygame.event.get():
1046         if event.type == pygame.QUIT:
1047             isOpened=False
1048             pygame.quit()
1049             sys.exit()
1050         elif event.type == timer_event and (difficulty == 1 or difficulty == 2):
1051             counter -= 1
1052             #每次減少一秒就重新渲染秒數
1053             counterText = counterFont.render(str(counter), True, (128, 0, 0))
1054             if counter == 0:
1055                 difficulty=3
1056             if counter>0:
1057                 screen.blit(counterText, (1130,60))
1058                 pygame.display.flip()
```

原先有許多累贅程式碼，共有 1058；省略累贅程式碼後僅剩下 362 行程式碼，如下圖。



使用方法是累贅程式碼寫成 function 型態，增加重複性。

```
def EasyActions(i):
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyLeftHandX[i],easyLeftHandY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyLeftElbowX[i],easyLeftElbowY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyLeftShoulderX[i],easyLeftShoulderY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyLeftKneeX[i],easyLeftKneeY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyLeftAnkleX[i],easyLeftAnkleY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyRightHandX[i],easyRightHandY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyRightElbowX[i],easyRightElbowY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyRightShoulderX[i],easyRightShoulderY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyRightKneeX[i],easyRightKneeY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (easyRightAnkleX[i],easyRightAnkleY[i]))
```

```
def HardActions(i):
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardLeftHandX[i],hardLeftHandY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardLeftElbowX[i],hardLeftElbowY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardLeftShoulderX[i],hardLeftShoulderY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardLeftKneeX[i],hardLeftKneeY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardLeftAnkleX[i],hardLeftAnkleY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardRightHandX[i],hardRightHandY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardRightElbowX[i],hardRightElbowY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardRightShoulderX[i],hardRightShoulderY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardRightKneeX[i],hardRightKneeY[i]))
    s = pygame.Surface((squareSize,squareSize), pygame.SRCALPHA)
    s.fill((0,255,0,100))
    screen.blit(s, (hardRightAnkleX[i],hardRightAnkleY[i]))
```

```
def JudgeHardPose(i):
    (leftIndexX<hardLeftHandX[i]) and (leftIndexX<hardLeftHandX[i]+squareSize) and (leftIndexY<hardLeftHandY[i]) and (leftIndexY<hardLeftHandY[i]+squareSize) and \
    (leftElbowX<hardLeftElbowX[i]) and (leftElbowX<hardLeftElbowX[i]+squareSize) and (leftElbowY<hardLeftElbowY[i]) and (leftElbowY<hardLeftElbowY[i]+squareSize) and \
    (leftShoulderX<hardLeftShoulderX[i]) and (leftShoulderX<hardLeftShoulderX[i]+squareSize) and (leftShoulderY<hardLeftShoulderY[i]) and (leftShoulderY<hardLeftShoulderY[i]+squareSize) and \
    (leftKneeX<hardLeftKneeX[i]) and (leftKneeX<hardLeftKneeX[i]+squareSize) and (leftKneeY<hardLeftKneeY[i]) and (leftKneeY<hardLeftKneeY[i]+squareSize) and \
    (leftAnkleX<hardLeftAnkleX[i]) and (leftAnkleX<hardLeftAnkleX[i]+squareSize) and (leftAnkleY<hardLeftAnkleY[i]) and (leftAnkleY<hardLeftAnkleY[i]+squareSize) and \
    (rightIndexX<hardRightHandX[i]) and (rightIndexX<hardRightHandX[i]+squareSize) and (rightIndexY<hardRightHandY[i]) and (rightIndexY<hardRightHandY[i]+squareSize) and \
    (rightElbowX<hardRightElbowX[i]) and (rightElbowX<hardRightElbowX[i]+squareSize) and (rightElbowY<hardRightElbowY[i]) and (rightElbowY<hardRightElbowY[i]+squareSize) and \
    (rightShoulderX<hardRightShoulderX[i]) and (rightShoulderX<hardRightShoulderX[i]+squareSize) and (rightShoulderY<hardRightShoulderY[i]) and (rightShoulderY<hardRightShoulderY[i]+squareSize) and \
    (rightKneeX<hardRightKneeX[i]) and (rightKneeX<hardRightKneeX[i]+squareSize) and (rightKneeY<hardRightKneeY[i]) and (rightKneeY<hardRightKneeY[i]+squareSize) and \
    (rightAnkleX<hardRightAnkleX[i]) and (rightAnkleX<hardRightAnkleX[i]+squareSize) and (rightAnkleY<hardRightAnkleY[i]) and (rightAnkleY<hardRightAnkleY[i]+squareSize)

def JudgeEasyPose(i):
    (leftIndexX<easyLeftHandX[i]) and (leftIndexX<easyLeftHandX[i]+squareSize) and (leftIndexY<easyLeftHandY[i]) and (leftIndexY<easyLeftHandY[i]+squareSize) and \
    (leftElbowX<easyLeftElbowX[i]) and (leftElbowX<easyLeftElbowX[i]+squareSize) and (leftElbowY<easyLeftElbowY[i]) and (leftElbowY<easyLeftElbowY[i]+squareSize) and \
    (leftShoulderX<easyLeftShoulderX[i]) and (leftShoulderX<easyLeftShoulderX[i]+squareSize) and (leftShoulderY<easyLeftShoulderY[i]) and (leftShoulderY<easyLeftShoulderY[i]+squareSize) and \
    (leftKneeX<easyLeftKneeX[i]) and (leftKneeX<easyLeftKneeX[i]+squareSize) and (leftKneeY<easyLeftKneeY[i]) and (leftKneeY<easyLeftKneeY[i]+squareSize) and \
    (leftAnkleX<easyLeftAnkleX[i]) and (leftAnkleX<easyLeftAnkleX[i]+squareSize) and (leftAnkleY<easyLeftAnkleY[i]) and (leftAnkleY<easyLeftAnkleY[i]+squareSize) and \
    (rightIndexX<easyRightHandX[i]) and (rightIndexX<easyRightHandX[i]+squareSize) and (rightIndexY<easyRightHandY[i]) and (rightIndexY<easyRightHandY[i]+squareSize) and \
    (rightElbowX<easyRightElbowX[i]) and (rightElbowX<easyRightElbowX[i]+squareSize) and (rightElbowY<easyRightElbowY[i]) and (rightElbowY<easyRightElbowY[i]+squareSize) and \
    (rightShoulderX<easyRightShoulderX[i]) and (rightShoulderX<easyRightShoulderX[i]+squareSize) and (rightShoulderY<easyRightShoulderY[i]) and (rightShoulderY<easyRightShoulderY[i]+squareSize) and \
    (rightKneeX<easyRightKneeX[i]) and (rightKneeX<easyRightKneeX[i]+squareSize) and (rightKneeY<easyRightKneeY[i]) and (rightKneeY<easyRightKneeY[i]+squareSize) and \
    (rightAnkleX<easyRightAnkleX[i]) and (rightAnkleX<easyRightAnkleX[i]+squareSize) and (rightAnkleY<easyRightAnkleY[i]) and (rightAnkleY<easyRightAnkleY[i]+squareSize)
```