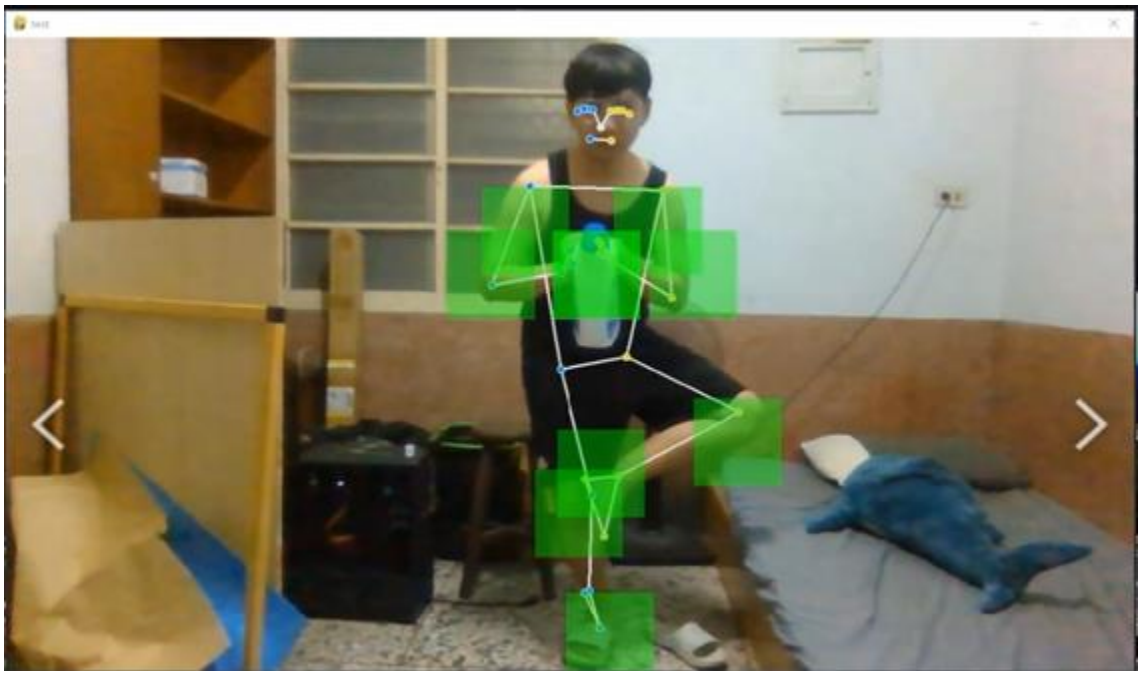
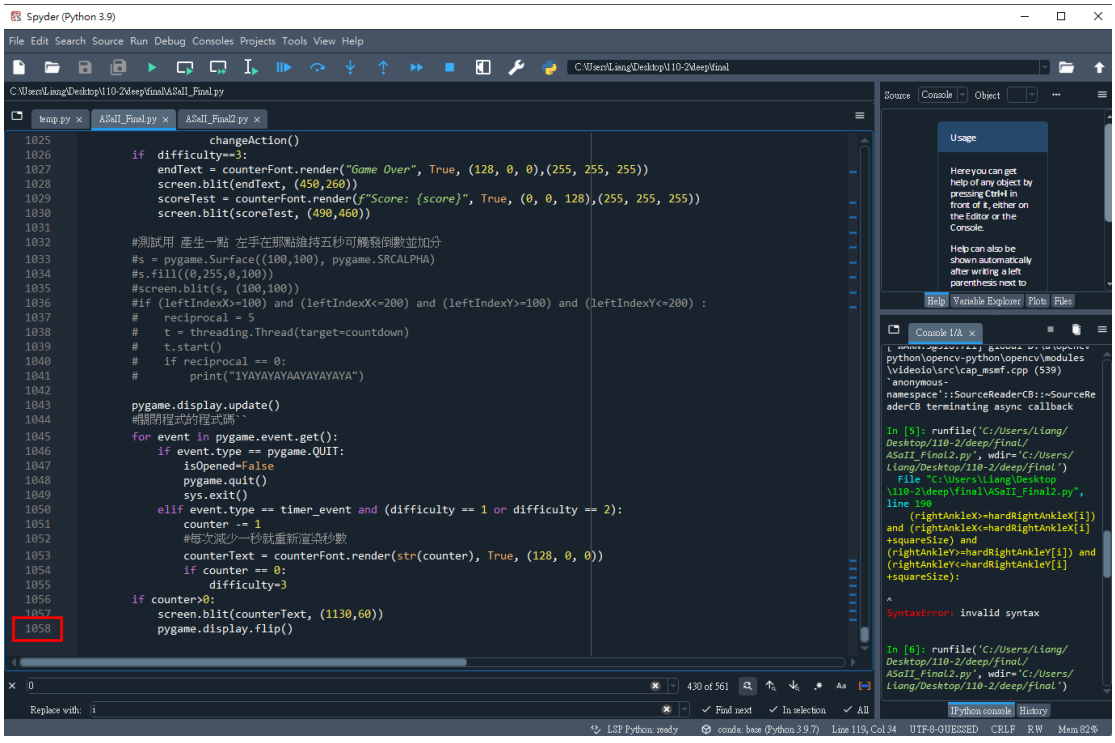
資料結構期末作業　　指導老師：謝文川　　學生：葉桔良

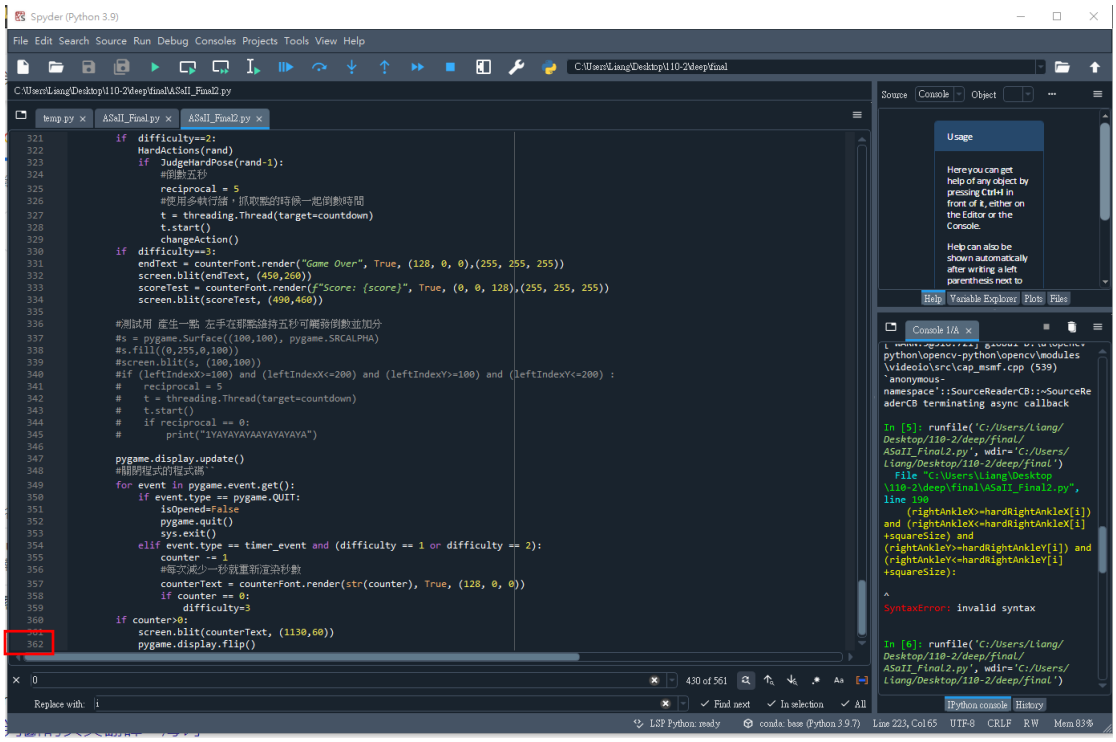
作業說明：



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。



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)
```