Video_A_Count

รูปโปรแกรม Jupyter Notebook

In [ ]:

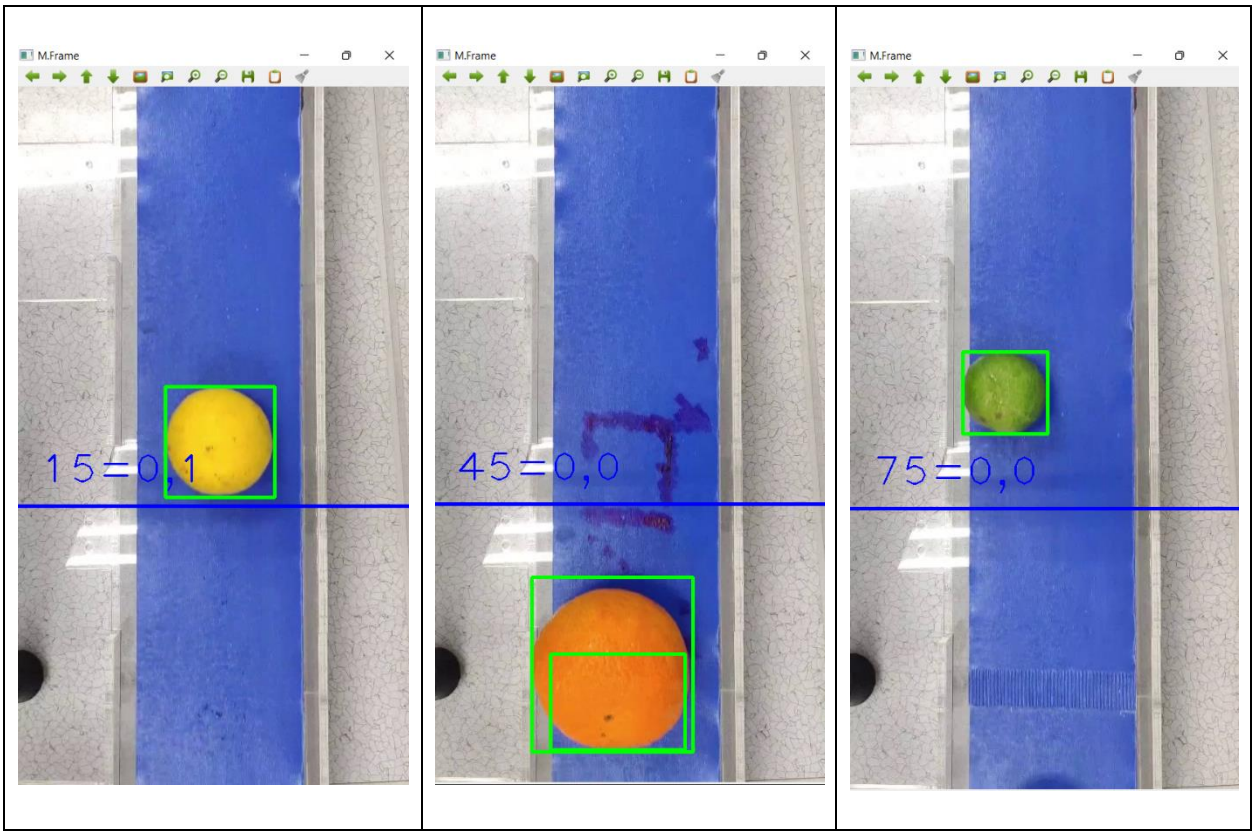
```
#Video_A
#นับจำนวนรวม
import cv2
cap = cv2.VideoCapture("../video/41_Video_A.mp4")

fourcc = cv2.VideoWriter_fourcc(*'MP4V')
out = cv2.VideoWriter('../video/41_Video_A_count.mp4', fourcc, 30, (540,960))

object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.60*height)  # 90%
ImageWidth = width #print(height,width)
positionText = (30,referenceLine-30)
nCar = 0
BoxInline_y = 1
BoxInline_x = 1
while(cap.isOpened()):
    ret, frame = cap.read()
    height, width, _ = frame.shape
    BoxInline_y = BoxInline_x
    BoxInline_x = 0
    roi = frame[0: 960,0: 540]
    mask = object_detector.apply(roi)
    _, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
    contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)
    for cnt in contours:
        area = cv2.contourArea(cnt)
        if area > 9000:
            x, y, w, h = cv2.boundingRect(cnt)
            cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
            if y < referenceLine and (y+h) > referenceLine:
                BoxInline_x = 1
    if BoxInline_y==0 and BoxInline_x==1:
        nCar = nCar + 1
    textShow = str(nCar)+'='+str(BoxInline_x)+','+str(BoxInline_y)
    cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
    cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)
    cv2.imshow("M.Frame", frame)
    #cv2.imshow("Contours", roi)
    key = cv2.waitKey(30)
    out.write(frame)
    if cv2.waitKey(1) & 0xFF == 27:  # ESC Key
        break

cap.release()
cv2.destroyAllWindows()
```

Code Python3

```
#Video_A
#นับจำนวนรวม
import cv2
cap = cv2.VideoCapture("../video/41_Video_A.mp4")

fourcc = cv2.VideoWriter_fourcc(*'MP4V')
out = cv2.VideoWriter('../video/41_Video_A_count.mp4', fourcc, 30, (540,960))

object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.60*height)  # 90%
ImageWidth = width #print(height,width)
positionText = (30,referenceLine-30)
nCar = 0
BoxInline_y = 1
BoxInline_x = 1
while(cap.isOpened()):
    ret, frame = cap.read()
    height, width, _ = frame.shape
    BoxInline_y = BoxInline_x
    BoxInline_x = 0
    roi = frame[0: 960,0: 540]
    mask = object_detector.apply(roi)
    _, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
    contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)
    for cnt in contours:
        area = cv2.contourArea(cnt)
```

```
        if area > 9000:
            x, y, w, h = cv2.boundingRect(cnt)
            cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
            if y < referenceLine and (y+h) > referenceLine:
                BoxInline_x = 1
    if BoxInline_y==0 and BoxInline_x==1:
        nCar = nCar + 1
    textShow = str(nCar)+'='+str(BoxInline_x)+','+str(BoxInline_y)
    cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
    cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)
    cv2.imshow("M.Frame", frame)
    #cv2.imshow("Contours", roi)
    key = cv2.waitKey(30)
    out.write(frame)
    if cv2.waitKey(1) & 0xFF == 27:  # ESC Key
        break

cap.release()
cv2.destroyAllWindows()
```

ผลการทำงาน



วิดีโอผลการทำงาน

https://youtu.be/lKVkur6cUm0

บันทึกผลในตาราง

รายการ	จำนวนชิ้นงานจริง	ผลการนับด้วยโปรแกรม	ผลต่าง	ถูกต้อง(%)
Video_A	77	77	0	100%

Video_B_Count

รูปโปรแกรม Jupyter Notebook

In [2]:

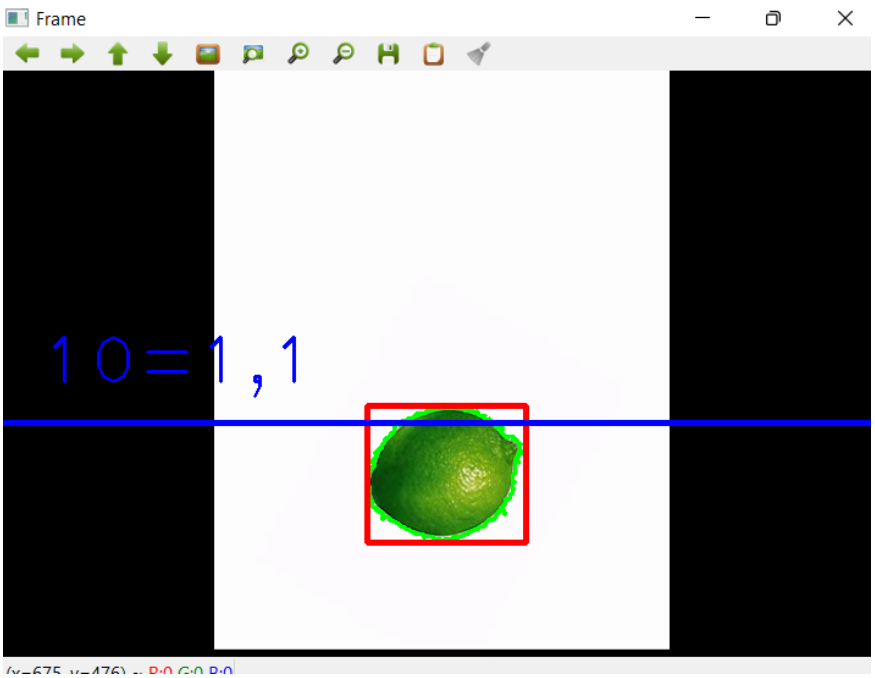
```python
#Video_B #นับจำนวนรวม
import cv2
cap = cv2.VideoCapture("../video/42_Video_B.mp4")
fourcc = cv2.VideoWriter_fourcc(*'MP4V')
frame_width = int(cap.get(cv2.CAP_PROP_FRAME_WIDTH))
frame_height = int(cap.get(cv2.CAP_PROP_FRAME_HEIGHT))
out = cv2.VideoWriter('../video/42_Video_B_Count.avi', fourcc, 30, (frame_width, frame_height))
object_detector = cv2.createBackgroundSubtractorMOG2()

ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.60*height) # 90%
ImageWidth = width
#print(height,width)
positionText = (30,referenceLine-30)
nCar = 0
BoxInline_y = 1
BoxInline_x = 1

while(cap.isOpened()):
    ret, frame = cap.read()
    if frame is None:
         break
    BoxInline_y = BoxInline_x
    BoxInline_x = 0

    mask = object_detector.apply(frame)
    contours, _ = cv2.findContours(mask, cv2.RETR_EXTERNAL, cv2.CHAIN_APPROX_SIMPLE)
    for cnt in contours:
         # Calculate area and remove small elements
        area = cv2.contourArea(cnt)
        if area > 1000:
            cv2.drawContours(frame, [cnt], -1, (0, 255, 0), 2)
            x, y, w, h = cv2.boundingRect(cnt)
            cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 0, 255), 3)

            if y < referenceLine and (y+h) > referenceLine:
                BoxInline_x = 1

    if BoxInline_y==0 and BoxInline_x==1:
        nCar = nCar + 1

    textShow = str(nCar)+'='+str(BoxInline_x)+','+str(BoxInline_y)
    cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
    cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)

    cv2.imshow("Mask", mask)
    cv2.imshow("Frame", frame)
    out.write(frame)
    if cv2.waitKey(1) & 0xFF == 27: # ESC Key
        break
cap.release()
cv2.destroyAllWindows()
```

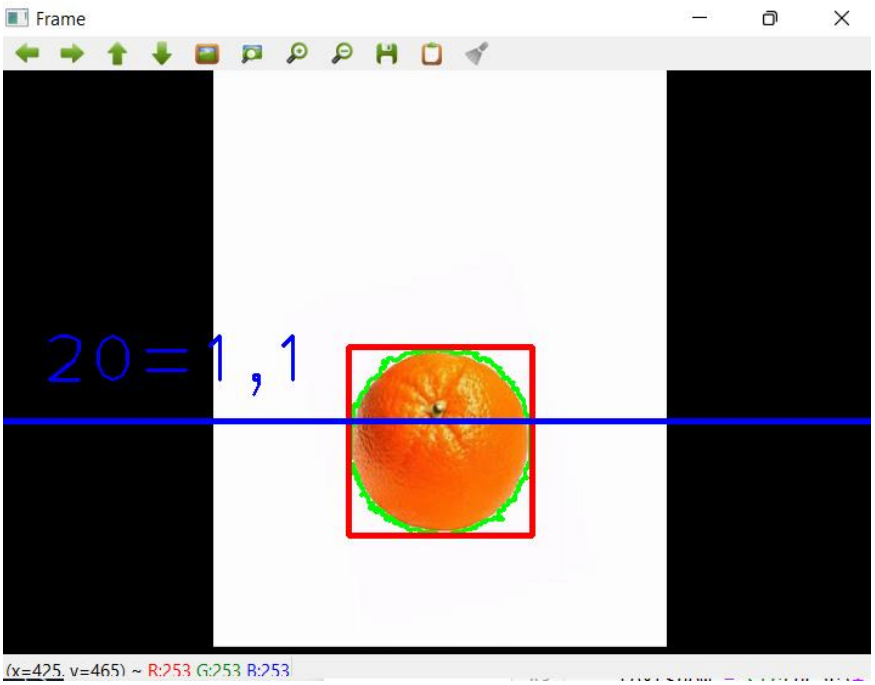
Code Python3

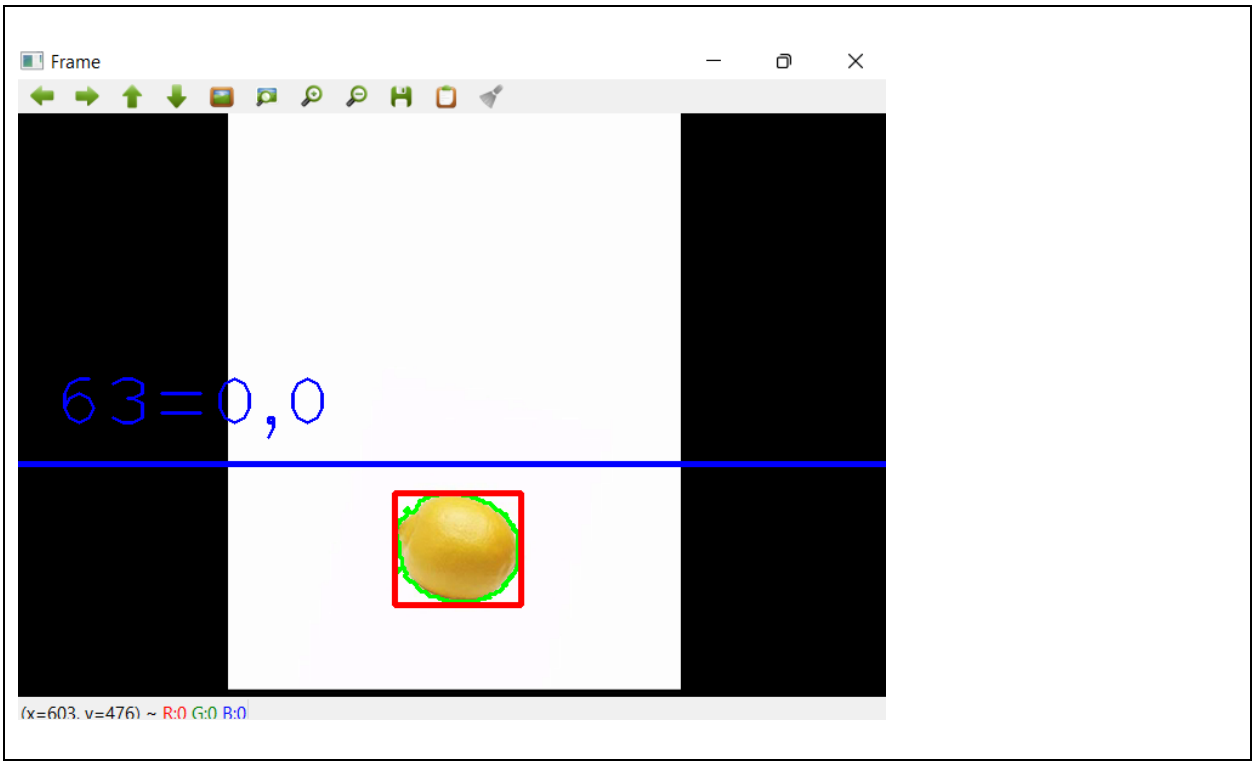
```
#Video_B #นับจำนวนรวม
import cv2
cap = cv2.VideoCapture("../video/42_Video_B.mp4")
fourcc = cv2.VideoWriter_fourcc(*'MP4V')
frame_width = int(cap.get(cv2.CAP_PROP_FRAME_WIDTH))
frame_height = int(cap.get(cv2.CAP_PROP_FRAME_HEIGHT))
out = cv2.VideoWriter('../video/42_Video_B_Count.avi', fourcc, 30, (frame_width,
frame_height))
object_detector = cv2.createBackgroundSubtractorMOG2()

ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.60*height) # 90%
ImageWidth = width
#print(height,width)
positionText = (30,referenceLine-30)
nCar = 0
BoxInline_y = 1
BoxInline_x = 1

while(cap.isOpened()):
    ret, frame = cap.read()
    if frame is None:
        break
    BoxInline_y = BoxInline_x
    BoxInline_x = 0

    mask = object_detector.apply(frame)
```

```
    contours, _ = cv2.findContours(mask, cv2.RETR_EXTERNAL, cv2.CHAIN_APPROX_SIMPLE)
    for cnt in contours:
         # Calculate area and remove small elements
        area = cv2.contourArea(cnt)
        if area > 1000:
            cv2.drawContours(frame, [cnt], -1, (0, 255, 0), 2)
            x, y, w, h = cv2.boundingRect(cnt)
            cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 0, 255), 3)

            if y < referenceLine and (y+h) > referenceLine:
                BoxInline_x = 1

    if BoxInline_y==0 and BoxInline_x==1:
        nCar = nCar + 1

    textShow = str(nCar)+'='+str(BoxInline_x)+','+str(BoxInline_y)
    cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
    cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)

    cv2.imshow("Mask", mask)
    cv2.imshow("Frame", frame)
    out.write(frame)
    if cv2.waitKey(1) & 0xFF == 27: # ESC Key
        break
cap.release()
cv2.destroyAllWindows()
```

ผลการทำงาน







วิดีโอผลการทำงาน

https://youtu.be/gRJxLdb8ZNs

บันทึกผลในตาราง

รายการ	จำนวนชิ้นงานจริง	ผลการนับด้วยโปรแกรม	ผลต่าง	ถูกต้อง(%)
Video_B	80	80	0	100%

Video_C_Count

รูปโปรแกรม Jupyter Notebook

In [*]:

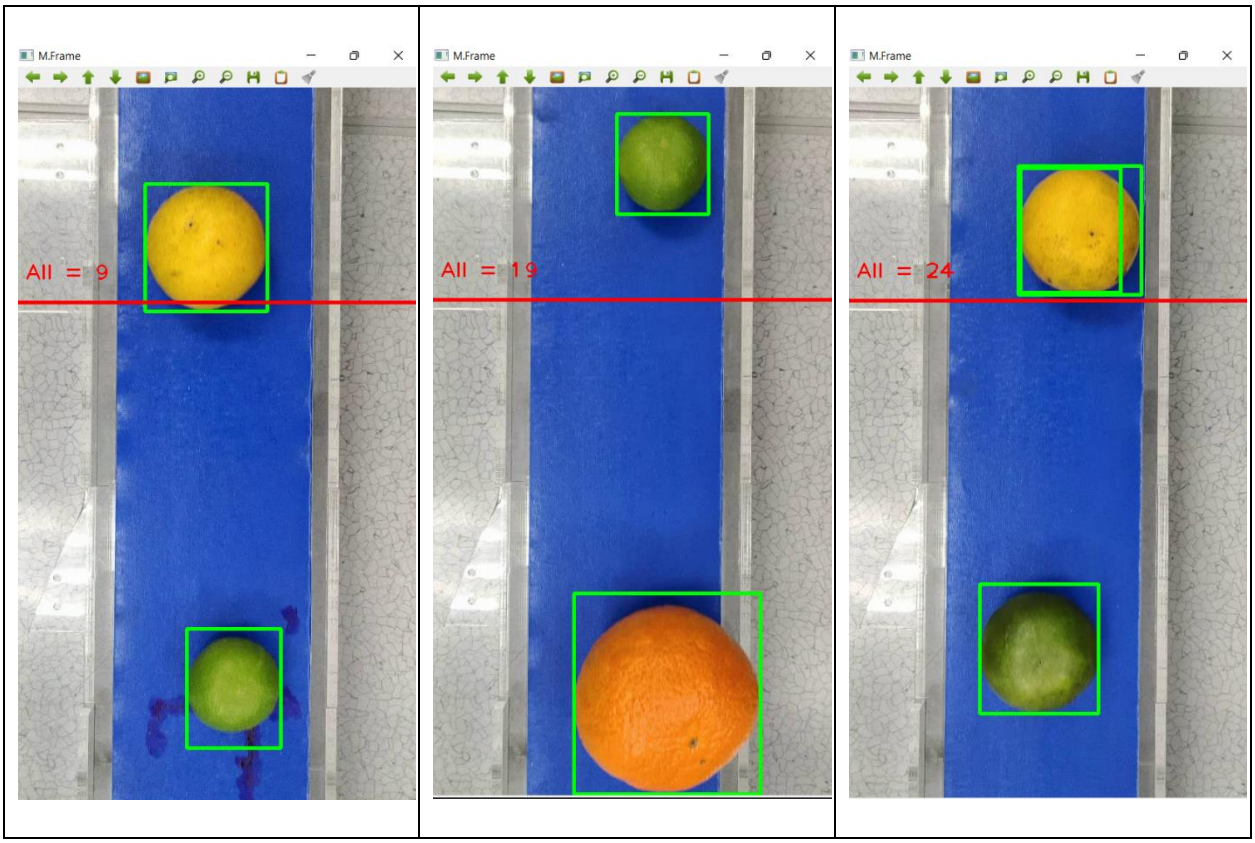
```python
#Video_C นับรวม
import cv2
cap = cv2.VideoCapture("../video/43_Video_C.avi")
fourcc = cv2.VideoWriter_fourcc(*'XVID')
out = cv2.VideoWriter('../video/video_C3.avi', fourcc, 30, (540,960))

object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.30*height)  # 90%
positionText = (10,referenceLine-30)
ImageWidth = width
All = 0
BoxInline_y = 1
BoxInline_x = 1
while(cap.isOpened()):
    ret, frame = cap.read()
    height, width, _ = frame.shape
    BoxInline_y = BoxInline_x
    BoxInline_x = 0
    roi = frame[0: 960,50: 490]
    mask = object_detector.apply(roi)
    _, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
    contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)

    for cnt in contours:
        area = cv2.contourArea(cnt)
        if area > 9000:
            x, y, w, h = cv2.boundingRect(cnt)
            cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
            if y < referenceLine and (y+h) > referenceLine:
                BoxInline_x = 1
    if BoxInline_y==0 and BoxInline_x==1:
        All = All + 1

    #textShow = str(All)+'='+str(BoxInline_x)+','+str(BoxInline_y)
    textShow = 'All = ' + str(All)

    cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(0, 0, 255), 3)
    cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 2, (0, 0, 255), 2)
    cv2.imshow("M.Frame", frame)
    cv2.imshow("Contours", mask)
    key = cv2.waitKey(30)
    #out.write(frame)
    if cv2.waitKey(1) & 0xFF == 27:  # ESC Key
        break

cap.release()
cv2.destroyAllWindows()
```

Code Python3

```
#Video_C นับรวม
import cv2
cap = cv2.VideoCapture("../video/43_Video_C.avi")

fourcc = cv2.VideoWriter_fourcc(*'XVID')
out = cv2.VideoWriter('../video/video_C3.avi', fourcc, 30, (540,960))



object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.30*height)  # 90%
positionText = (10,referenceLine-30)

ImageWidth = width
All = 0

BoxInline_y = 1
BoxInline_x = 1

while(cap.isOpened()):
    ret, frame = cap.read()
    height, width, _ = frame.shape

    BoxInline_y = BoxInline_x
    BoxInline_x = 0

    roi = frame[0: 960,50: 490]
```

```
    mask = object_detector.apply(roi)
    _, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
    contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)

    for cnt in contours:
        area = cv2.contourArea(cnt)
        if area > 9000:
            x, y, w, h = cv2.boundingRect(cnt)
            cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
            if y < referenceLine and (y+h) > referenceLine:
                BoxInline_x = 1
    if BoxInline_y==0 and BoxInline_x==1:
        All = All + 1

    #textShow = str(All)+'='+str(BoxInline_x)+','+str(BoxInline_y)
    textShow = 'All = ' + str(All)

    cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(0, 0, 255), 3)
    cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 2, (0, 0, 255), 2)

    cv2.imshow("M.Frame", frame)
    cv2.imshow("Contours", mask)
    key = cv2.waitKey(30)
    #out.write(frame)
    if cv2.waitKey(1) & 0xFF == 27:  # ESC Key
        break

cap.release()
cv2.destroyAllWindows()
```

ผลการทำงาน



วิดีโอผลการทำงาน

https://youtu.be/NezJAL54ES0

บันทึกผลในตาราง

รายการ	จำนวนชิ้นงานจริง	ผลการนับด้วยโปรแกรม	ผลต่าง	ถูกต้อง(%)
Video_C	100	103	-3	97%