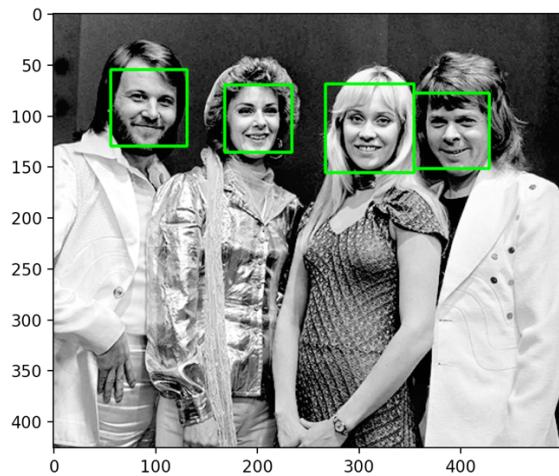


Task 4.2P

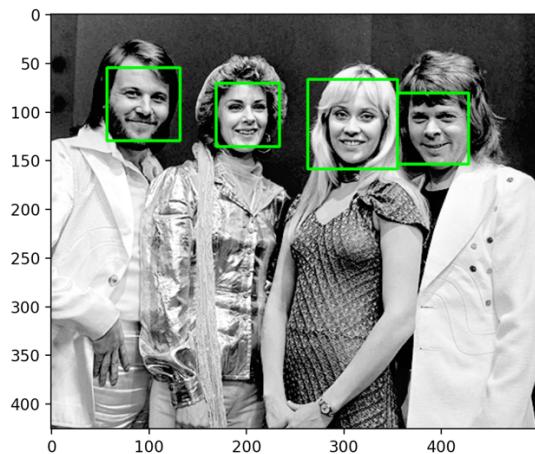
Scale factor 1.1



Time taken: 0.0984s

Face detected: 4

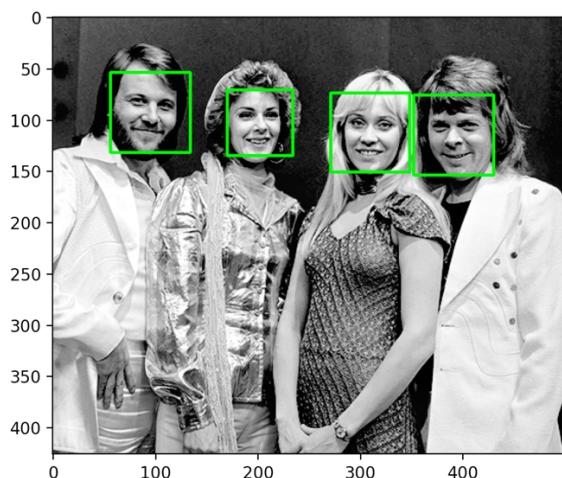
Scale factor 1.2



Time taken: 0.08089s

Face detected: 4

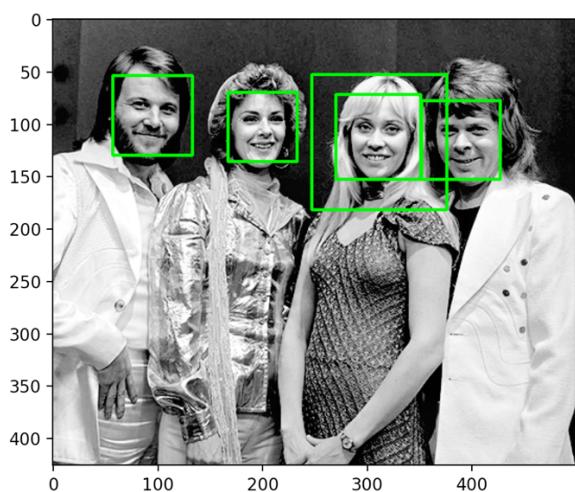
Scale factor 1.3



Time taken: 0.05888s

Face detected: 4

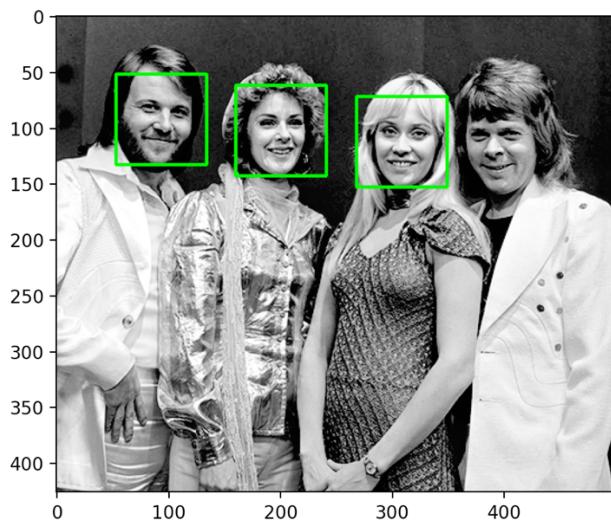
Scale factor 1.4



Time taken: 0.07455s

Face detected: 5

Scale factor 1.5



Time taken: 0.06522s

Face detected: 3

Conclusion: As the scale factor increases, the time to process the image decreases, however, the accuracy for the detection of faces decreases. When the scale increases, it increases the input image, which is the integral image, for the face detection model to detect a face. This means that there might be an overlapping of actual face detected so the face is detected more than once, or it will not detect the face at all the next integral image as the scale is too large.

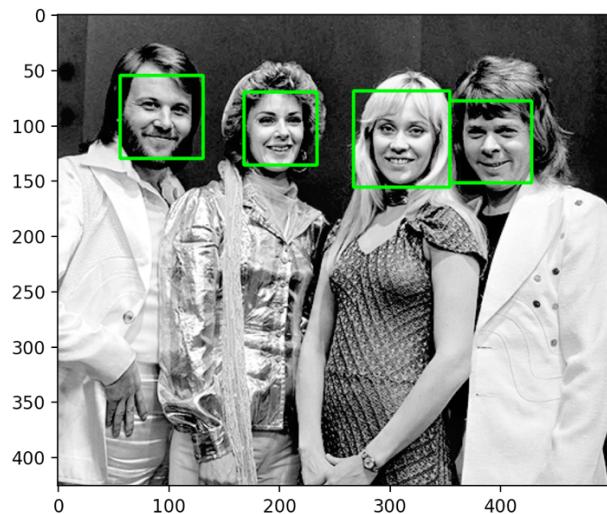
minNeighbours: 0



Time taken: 0.0909s

Face detected: 298

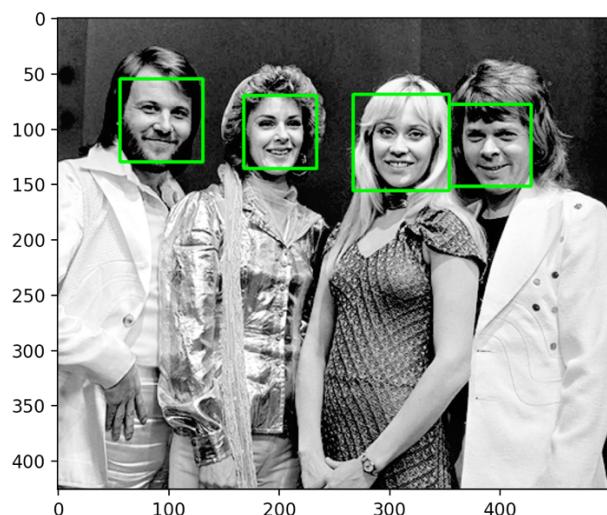
minNeighbours: 5



Time taken: 0.0856s

Face detected: 4

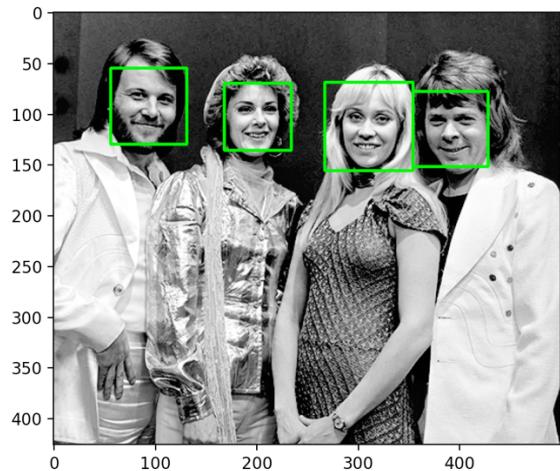
minNeighbours: 10



Time taken: 0.0842s

Face detected: 4

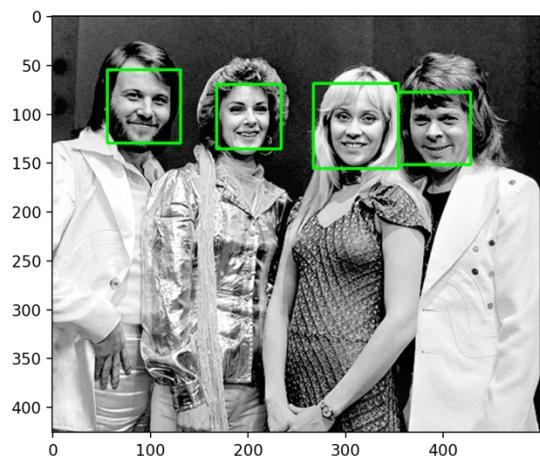
minNeighbours: 15



Time taken: 0.0849s

Face detected: 4

minNeighbours: 20

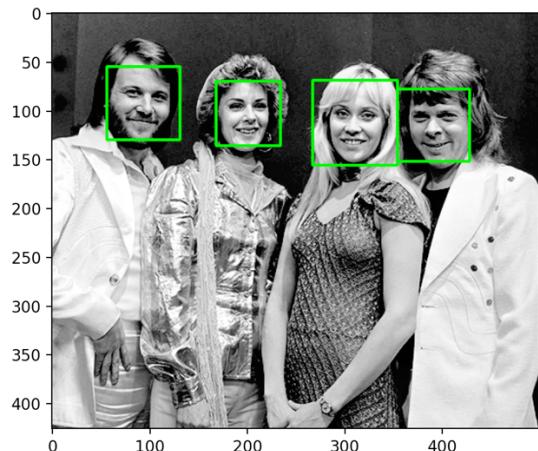


Time taken: 0.0776s

Face detected: 4

Conclusion: As the minNeighbour increases, the time to process the image decreases, but there is no decrease in the accuracy for the detection of faces. However, a too large increase in minNeighbours will result in the face detector not detecting any faces.

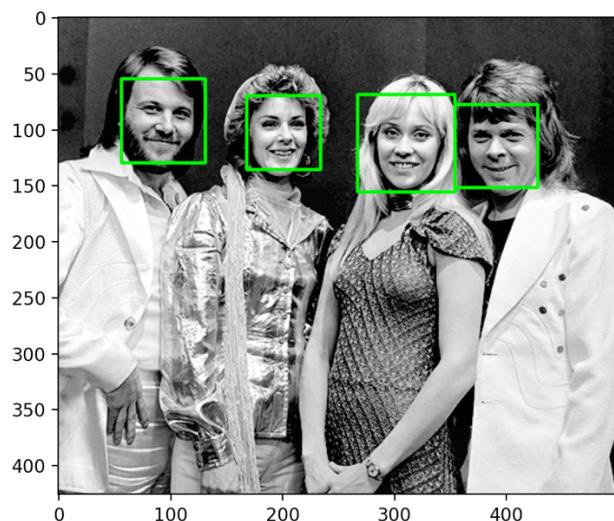
minSize: (10,10)



Time taken: 0.0827s

Face detected: 4

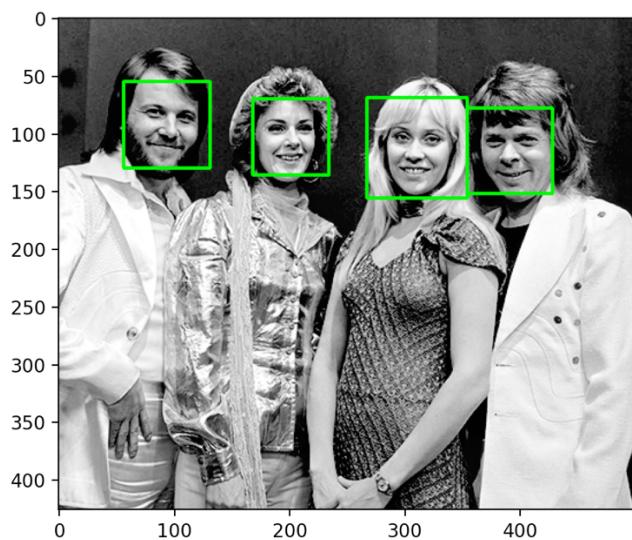
minSize: (20,20)



Time taken: 0.0840s

Face detected: 4

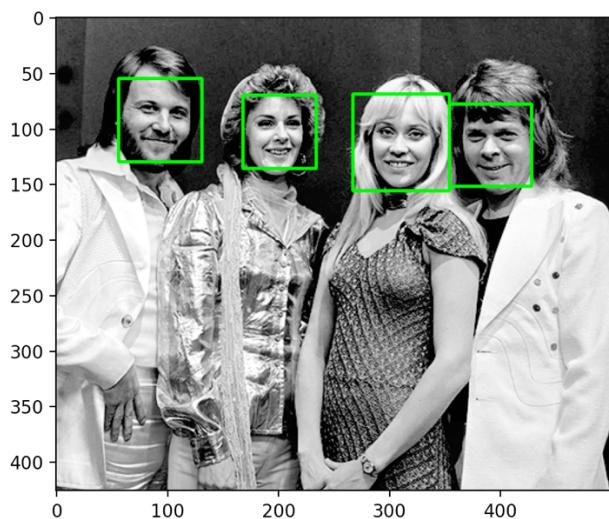
minSize: (30,30)



Time taken: 0.0904s

Face detected: 4

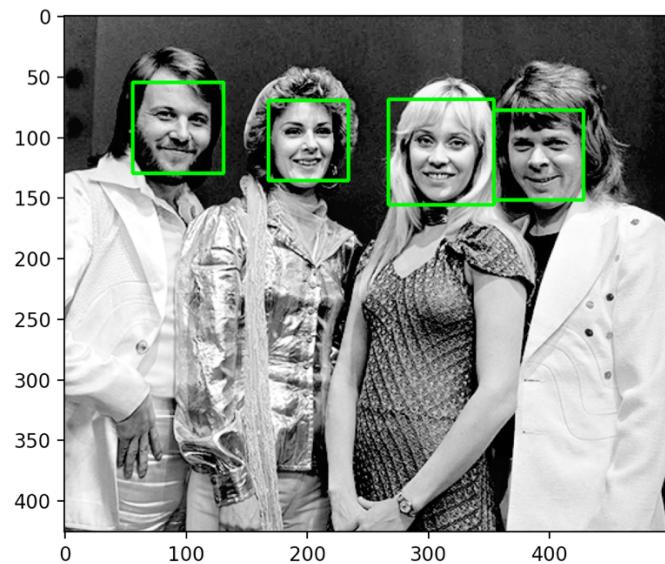
minSize: (40,40)



Time taken: 0.0794s

Face detected: 4

minSize: (50,50)

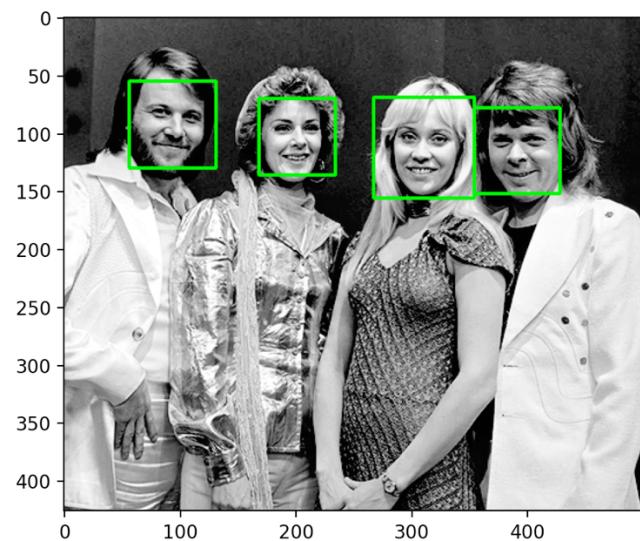


Time taken: 0.0884s

Face detected: 4

Conclusion: When the minSize increases, more area of the face is detected by the face detector.

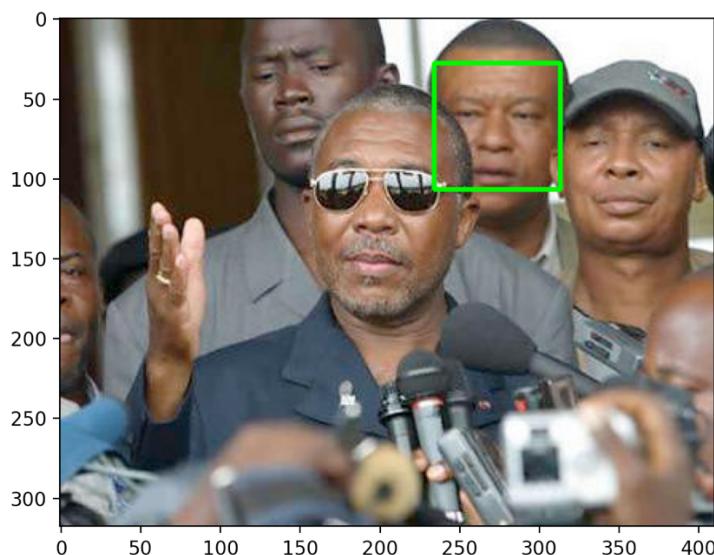
No Flags



Img_1014

Best parameters:

- scale factor: 1.2
- minNeighbours: 20
- minSize: (50,50)
- flags: cv.CASCADE_SCALE_IMAGE

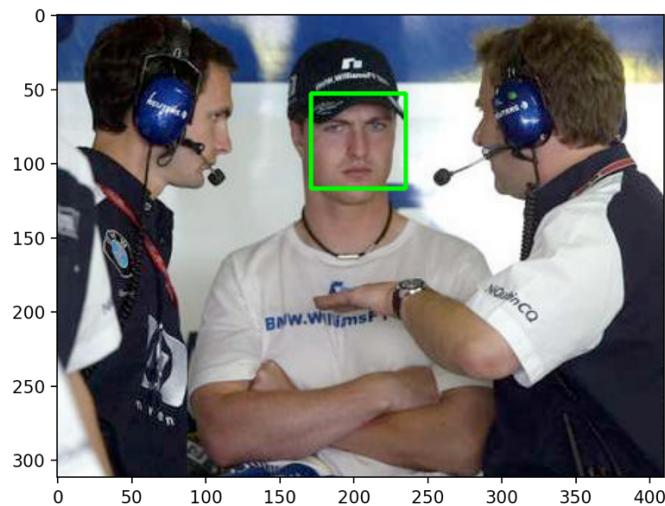


It is only able to capture one face due to the overlapping faces which the face detector is not able to capture as all the parameters are too large despite the processing is faster.

Img_1123

Best parameters:

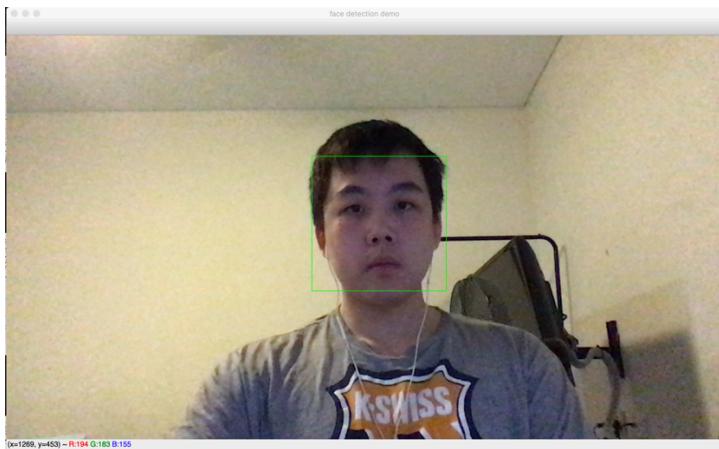
- scale factor: 1.2
- minNeighbours: 20
- minSize: (50,50)
- flags: cv.CASCADE_SCALE_IMAGE



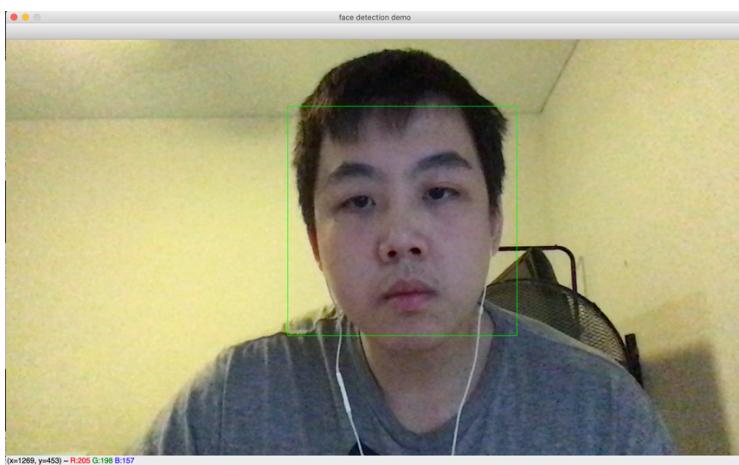
It is only able to capture one as some of the faces are not frontal and the face detector is not able to detect that.

Video Camera Detection

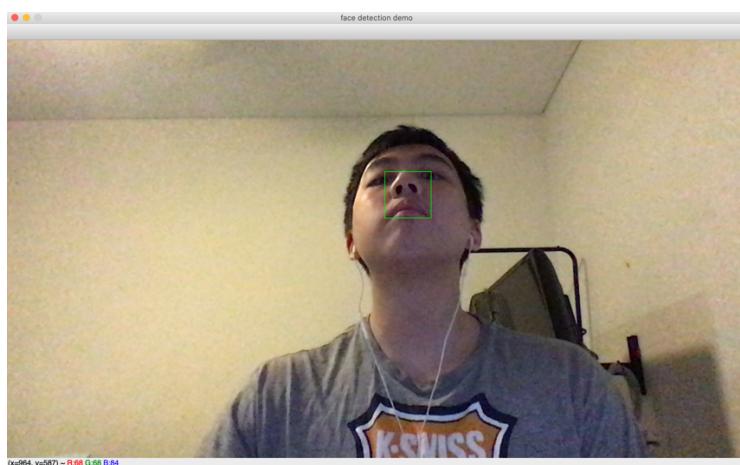
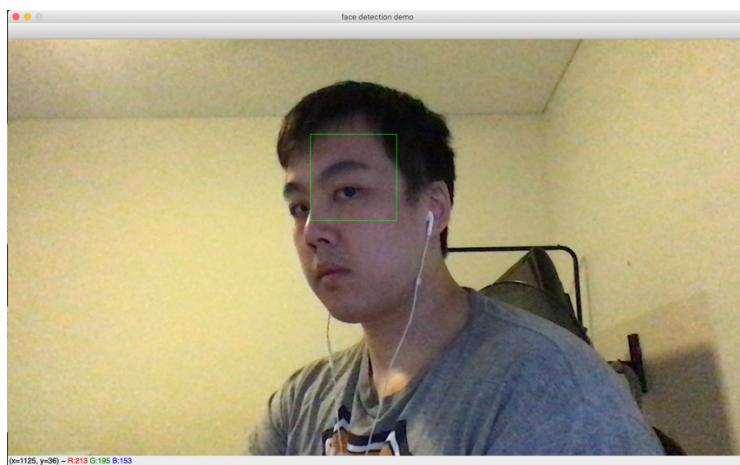
Far from camera:



Near to camera:



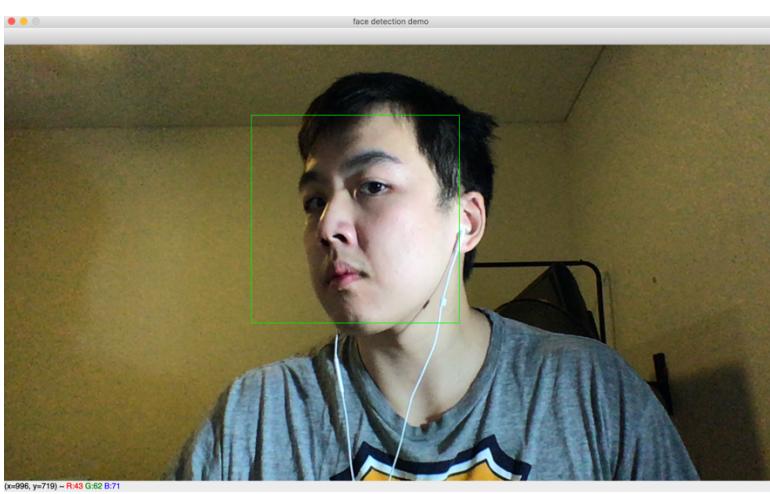
Different angles of face:



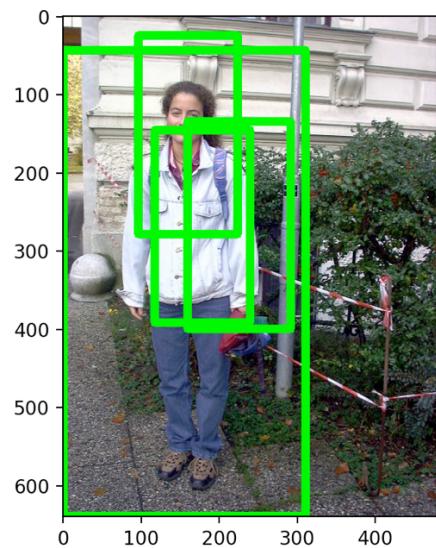
Covering facial features:



Brighter lighting environment:



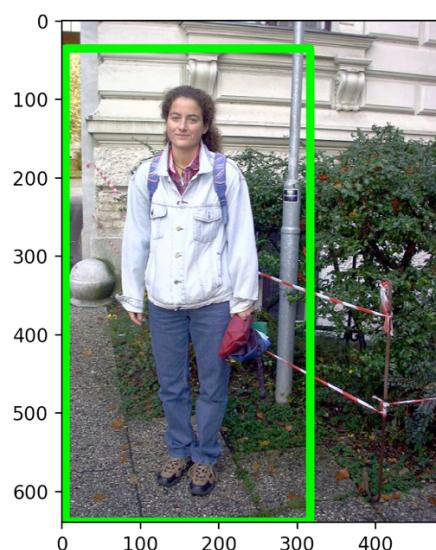
Comment out boxes = nms(boxes)



Time taken: 0.0803s

Pedestrian detected: 4

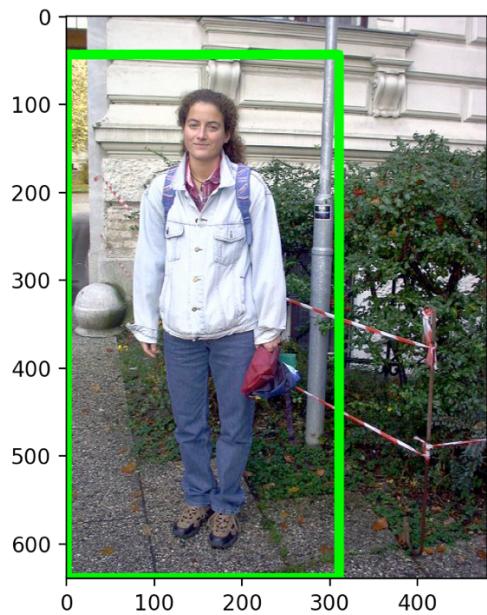
winStride: (2,2)



Time taken: 0.0884s

Pedestrian detected: 1

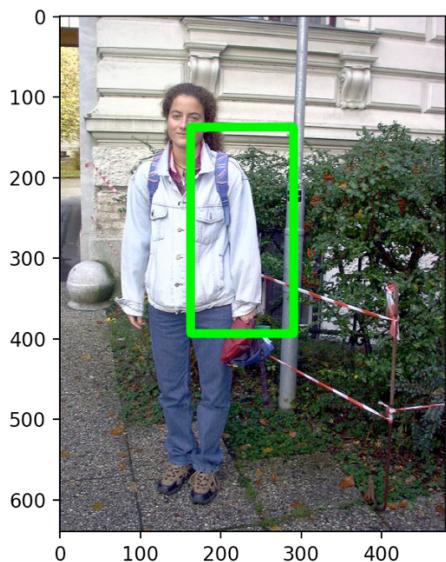
winStride: (4,4)



Time taken: 0.0727s

Pedestrian detected: 1

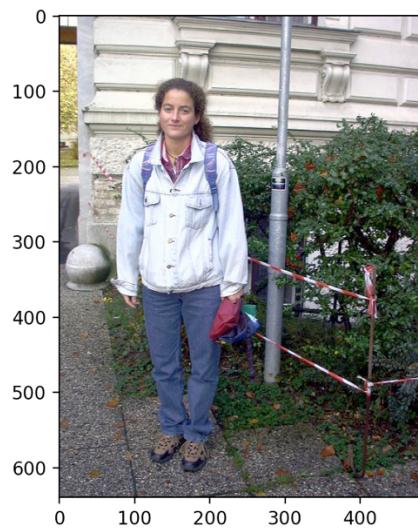
winStride: (6,6)



Time taken: 0.0984s

Pedestrian detected: 1

winStride: (8,8)

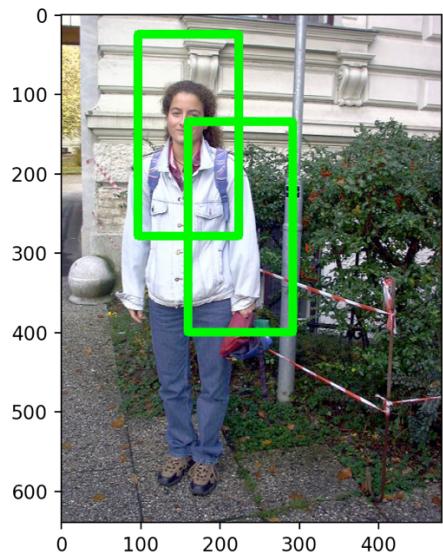


Time taken: 0.0396s

Pedestrian detected: 0

Conclusion: When the winStride increases, the accuracy to detect the pedestrian decreases. However, this is dependent on the image size. If the winStride is too big, the pedestrian will not be detected.

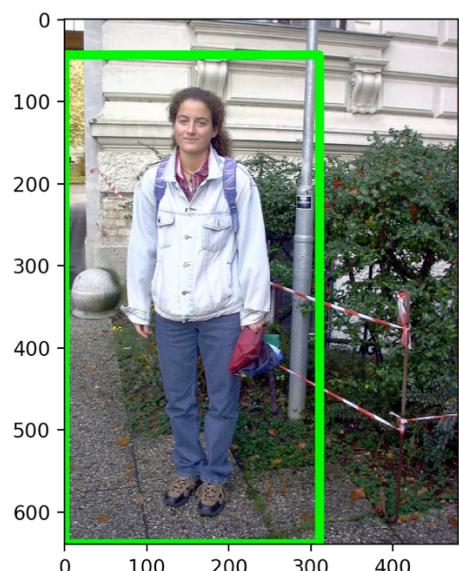
padding: (4,4)



Time taken: 0.0846s

Pedestrian detected: 2

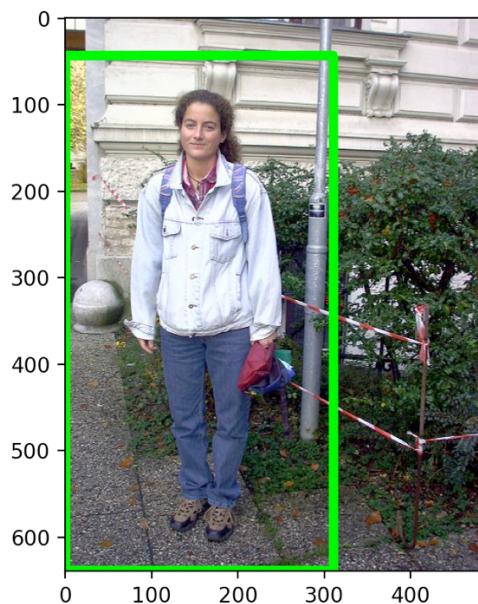
padding: (6,6)



Time taken: 0.0838s

Pedestrian detected: 1

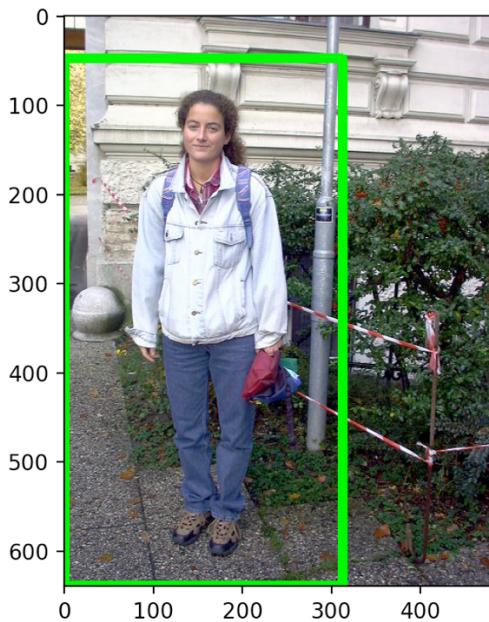
padding: (8,8)



Time taken: 0.0749s

Pedestrian detected: 1

padding: (10,10)

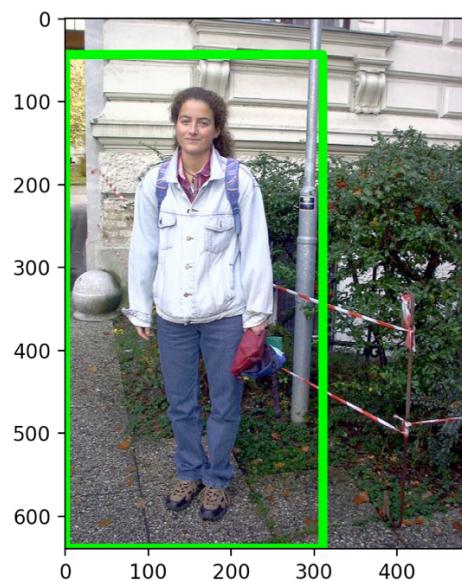


Time taken: 0.0812s

Pedestrian detected: 1

Conclusion: When the padding is too small, the accuracy of the pedestrian detector drops

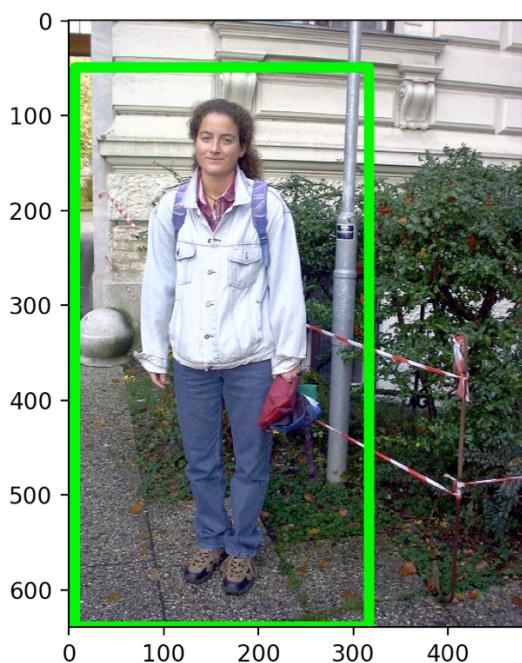
scale: 1.05



Time taken: 0.0827s

Pedestrian detected: 1

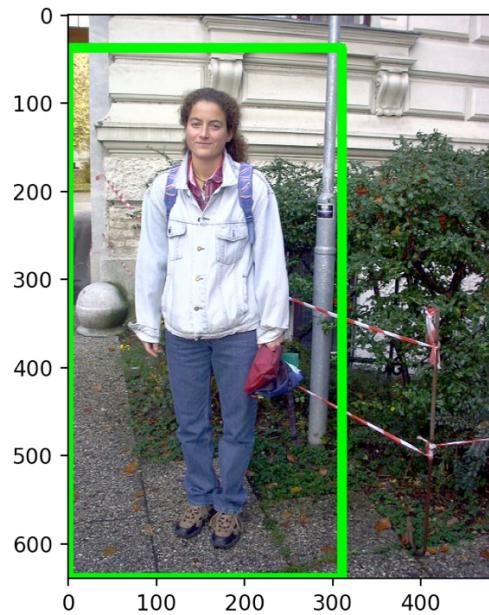
scale: 1.1



Time taken: 0.0784s

Pedestrian detected: 1

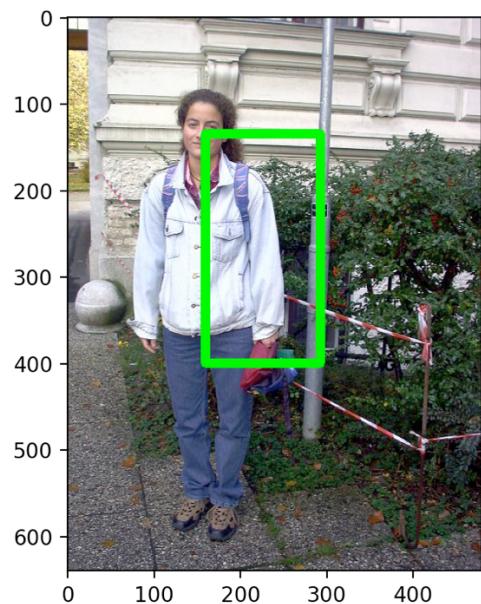
scale: 1.15



Time taken: 0.0684s

Pedestrian detected: 1

scale: 1.2



Time taken: 0.0597s

Pedestrian detected: 1

Conclusion: If the scale is too large, the accuracy of the pedestrian detector drops