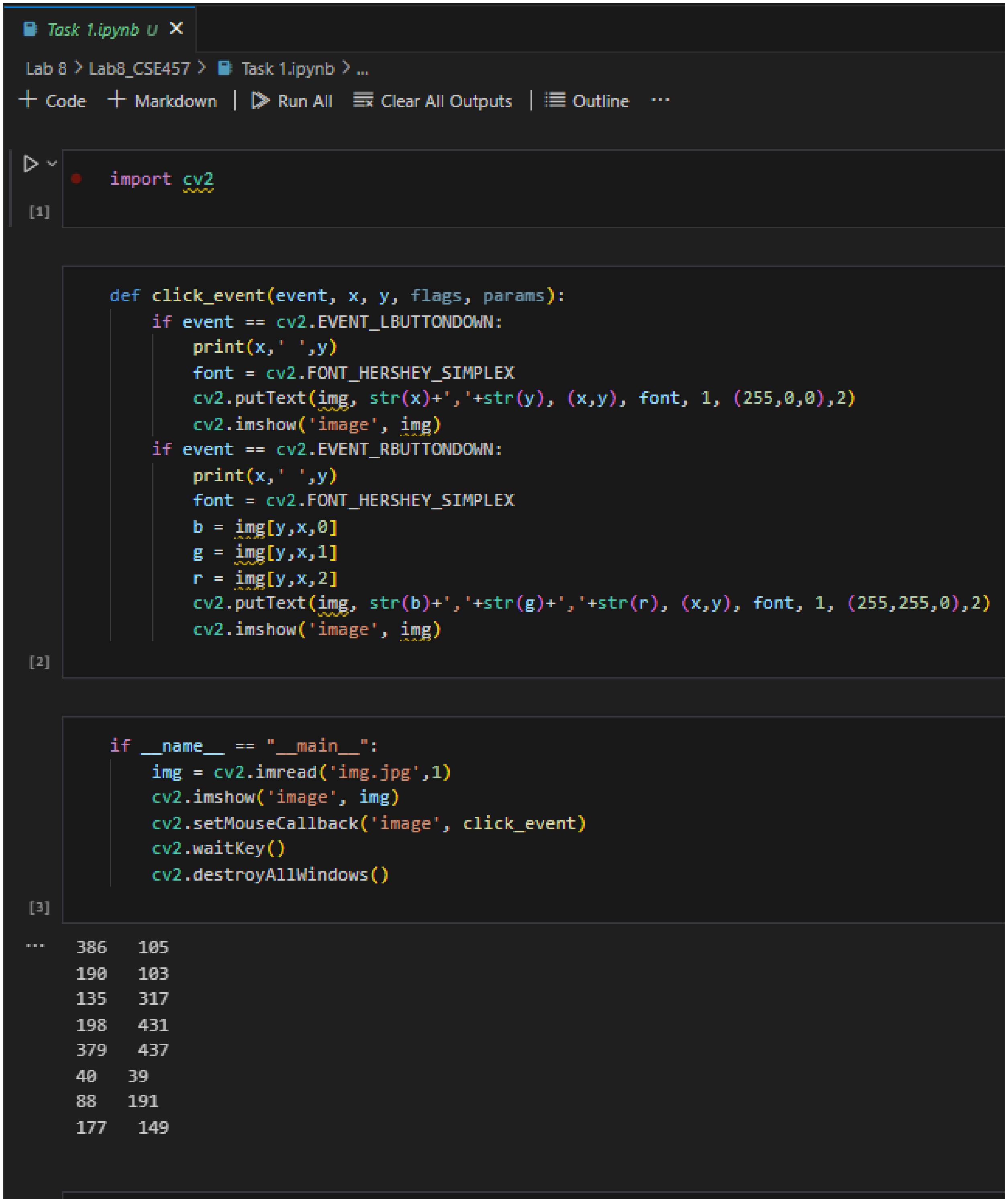
* Displaying Coordinates of the Image


Task 1.ipynb U ✕
Lab 8 > Lab8_CSE457 > Task 1.ipynb > ...
+ Code + Markdown | Run All Clear All Outputs | Outline ···
[1]
[2]
[3]
···

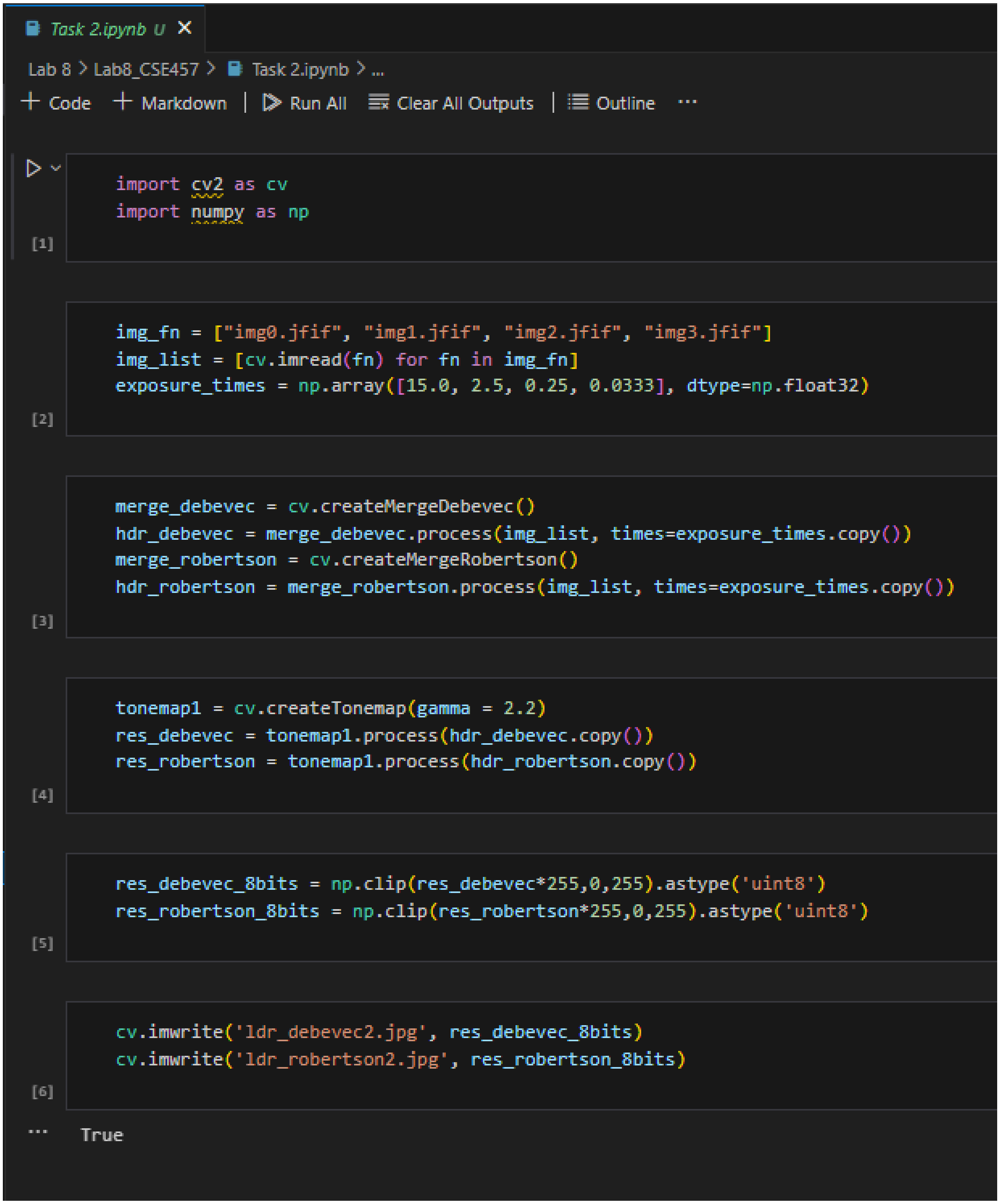
```
import cv2
```

```
def click_event(event, x, y, flags, params):
    if event == cv2.EVENT_LBUTTONDOWN:
        print(x,' ',y)
        font = cv2.FONT_HERSHEY_SIMPLEX
        cv2.putText(img, str(x)+','+str(y), (x,y), font, 1, (255,0,0),2)
        cv2.imshow('image', img)
    if event == cv2.EVENT_RBUTTONDOWN:
        print(x,' ',y)
        font = cv2.FONT_HERSHEY_SIMPLEX
        b = img[y,x,0]
        g = img[y,x,1]
        r = img[y,x,2]
        cv2.putText(img, str(b)+','+str(g)+','+str(r), (x,y), font, 1, (255,255,0),2)
        cv2.imshow('image', img)
```

```
if __name__ == "__main__":
    img = cv2.imread('img.jpg',1)
    cv2.imshow('image', img)
    cv2.setMouseCallback('image', click_event)
    cv2.waitKey()
    cv2.destroyAllWindows()
```

```
386   105
190   103
135   317
198   431
379   437
40   39
88   191
177   149
```

* High Dynamic Range of Images


Task 2.ipynb U
Lab 8 > Lab8_CSE457 > Task 2.ipynb > ...
+ Code + Markdown | Run All Clear All Outputs | Outline ...

```
[1]
import cv2 as cv
import numpy as np
```

```
[2]
img_fn = ["img0.jfif", "img1.jfif", "img2.jfif", "img3.jfif"]
img_list = [cv.imread(fn) for fn in img_fn]
exposure_times = np.array([15.0, 2.5, 0.25, 0.0333], dtype=np.float32)
```

```
[3]
merge_debevec = cv.createMergeDebevec()
hdr_debevec = merge_debevec.process(img_list, times=exposure_times.copy())
merge_robertson = cv.createMergeRobertson()
hdr_robertson = merge_robertson.process(img_list, times=exposure_times.copy())
```

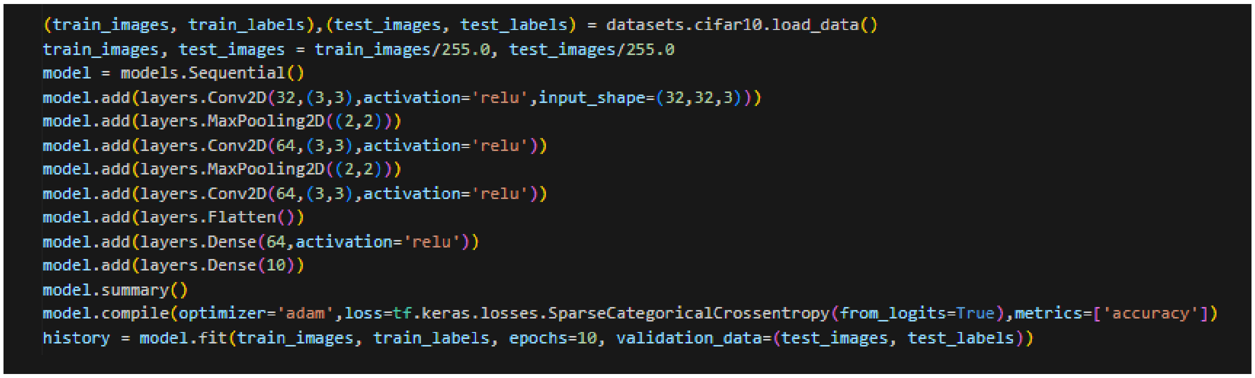
```
[4]
tonemap1 = cv.createTonemap(gamma = 2.2)
res_debevec = tonemap1.process(hdr_debevec.copy())
res_robertson = tonemap1.process(hdr_robertson.copy())
```

```
[5]
res_debevec_8bits = np.clip(res_debevec*255,0,255).astype('uint8')
res_robertson_8bits = np.clip(res_robertson*255,0,255).astype('uint8')
```

```
[6]
cv.imwrite('ldr_debevec2.jpg', res_debevec_8bits)
cv.imwrite('ldr_robertson2.jpg', res_robertson_8bits)
```

```
True
```

* CNN



```
(train_images, train_labels),(test_images, test_labels) = datasets.cifar10.load_data()
train_images, test_images = train_images/255.0, test_images/255.0
model = models.Sequential()
model.add(layers.Conv2D(32,(3,3),activation='relu',input_shape=(32,32,3)))
model.add(layers.MaxPooling2D((2,2)))
model.add(layers.Conv2D(64,(3,3),activation='relu'))
model.add(layers.MaxPooling2D((2,2)))
model.add(layers.Conv2D(64,(3,3),activation='relu'))
model.add(layers.Flatten())
model.add(layers.Dense(64,activation='relu'))
model.add(layers.Dense(10))
model.summary()
model.compile(optimizer='adam',loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),metrics=['accuracy'])
history = model.fit(train_images, train_labels, epochs=10, validation_data=(test_images, test_labels))
```