In [3]:
```
import numpy as np
```

In [5]:
```
once_arr=np.ones((3,3))
once_arr
```

Out[5]:
```
array([[1., 1., 1.],
       [1., 1., 1.],
       [1., 1., 1.]])
```

In [7]:
```
once_arr = np.ones((5,5),dtype=int)
once_arr
```

Out[7]:
```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

In [9]:
```
zeros_arr = np.zeros((3,3), dtype = int)
zeros_arr
```

Out[9]:
```
array([[0, 0, 0],
       [0, 0, 0],
       [0, 0, 0]])
```

In [11]:
```
once_arr
```

Out[11]:
```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

In [13]:
```
import matplotlib.pyplot as plt
```

In [14]:
```
from PIL import Image
```

In [19]:
```
TS_img = Image.open(r'C:\Users\mdtan\OneDrive\Desktop\NiT DS\1-times-square-stua
TS_img
```

Out[19]:


In [21]:
```
type(TS_img)
```

Out[21]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [23]:
```
TG_arr = np.asarray(TS_img)
TG_arr
```

Out[23]:
```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12, 29, 47],
        [33, 50, 68],
        [ 9, 24, 43]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57, 51, 77],
        [18,  9, 36],
        [57, 48, 75]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10, 38, 52],
        [20, 48, 62],
        [16, 42, 57]],

       ...,

       [[30, 21, 12],
        [32, 23, 14],
        [35, 26, 17],
        ...,
        [16, 16, 16],
        [16, 16, 16],
        [15, 15, 15]],

       [[31, 24, 16],
        [35, 28, 20],
        [39, 32, 24],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]],

       [[33, 26, 18],
        [37, 30, 22],
        [40, 33, 25],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]]], dtype=uint8)
```

In [25]:
```
type(TG_arr)
```

Out[25]:
```
numpy.ndarray
```

In [27]:
```
TG_arr.shape
```

Out[27]:
```
(624, 900, 3)
```

In [29]:
```
plt.imshow(TG_arr)
```

Out[29]: <matplotlib.image.AxesImage at 0x208d0116570>


In [38]:
```
TG = TG_arr.copy()
```

In [45]:
```
TG
```

Out[45]:
```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12, 29, 47],
        [33, 50, 68],
        [ 9, 24, 43]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57, 51, 77],
        [18,  9, 36],
        [57, 48, 75]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10, 38, 52],
        [20, 48, 62],
        [16, 42, 57]],

       ...,

       [[30, 21, 12],
        [32, 23, 14],
        [35, 26, 17],
        ...,
        [16, 16, 16],
        [16, 16, 16],
        [15, 15, 15]],

       [[31, 24, 16],
        [35, 28, 20],
        [39, 32, 24],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]],

       [[33, 26, 18],
        [37, 30, 22],
        [40, 33, 25],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]]], dtype=uint8)
```

In [47]:
```
TG_arr == TG
```

Out[47]:
```
array([[[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       ...,

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]]])
```

In [49]:
```
TS_img
```

Out[49]:


In [51]:
```
type(TS_img)
```

Out[51]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [61]:
```
TG_arr = np.asarray(TS_img)
TG_arr
```

Out[61]:
```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12, 29, 47],
        [33, 50, 68],
        [ 9, 24, 43]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57, 51, 77],
        [18,  9, 36],
        [57, 48, 75]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10, 38, 52],
        [20, 48, 62],
        [16, 42, 57]],

       ...,

       [[30, 21, 12],
        [32, 23, 14],
        [35, 26, 17],
        ...,
        [16, 16, 16],
        [16, 16, 16],
        [15, 15, 15]],

       [[31, 24, 16],
        [35, 28, 20],
        [39, 32, 24],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]],

       [[33, 26, 18],
        [37, 30, 22],
        [40, 33, 25],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]]], dtype=uint8)
```

In [63]:
```
type(TG_arr)
```

Out[63]:
```
numpy.ndarray
```

In [65]:
```
TG_arr.shape
```

Out[65]:
```
(624, 900, 3)
```

In [69]:
```
plt.imshow(TG_arr)
```

Out[69]: <matplotlib.image.AxesImage at 0x208d01e7410>


In [71]:
```
TS_img = TG_arr.copy()
```

In [73]:
```
TS_img
```

Out[73]:
```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12, 29, 47],
        [33, 50, 68],
        [ 9, 24, 43]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57, 51, 77],
        [18,  9, 36],
        [57, 48, 75]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10, 38, 52],
        [20, 48, 62],
        [16, 42, 57]],

       ...,

       [[30, 21, 12],
        [32, 23, 14],
        [35, 26, 17],
        ...,
        [16, 16, 16],
        [16, 16, 16],
        [15, 15, 15]],

       [[31, 24, 16],
        [35, 28, 20],
        [39, 32, 24],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]],

       [[33, 26, 18],
        [37, 30, 22],
        [40, 33, 25],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]]], dtype=uint8)
```

In [77]:
```
TS_img == TG_arr
```

Out[77]:
```
array([[[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       ...,

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]]])
```

In [81]:
```
plt.imshow(TS_img)
```

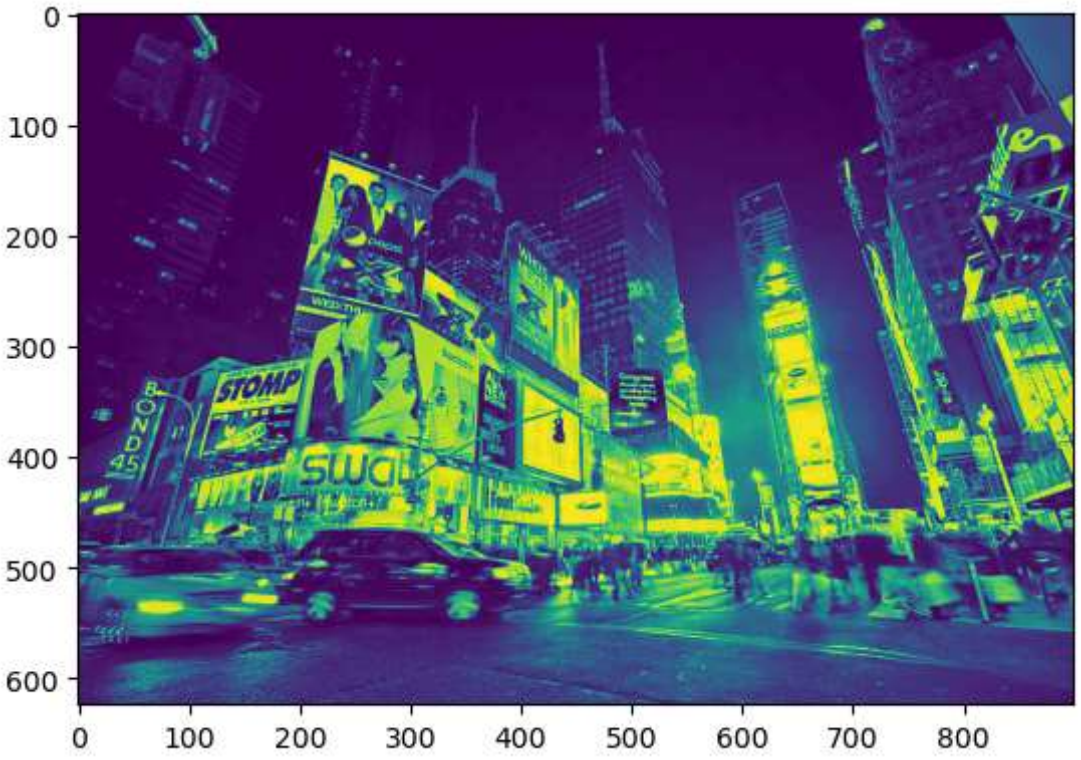
Out[81]:
```
<matplotlib.image.AxesImage at 0x208d01a5d90>
```


In [83]:
```
TS_img.shape
```

Out[83]: (624, 900, 3)

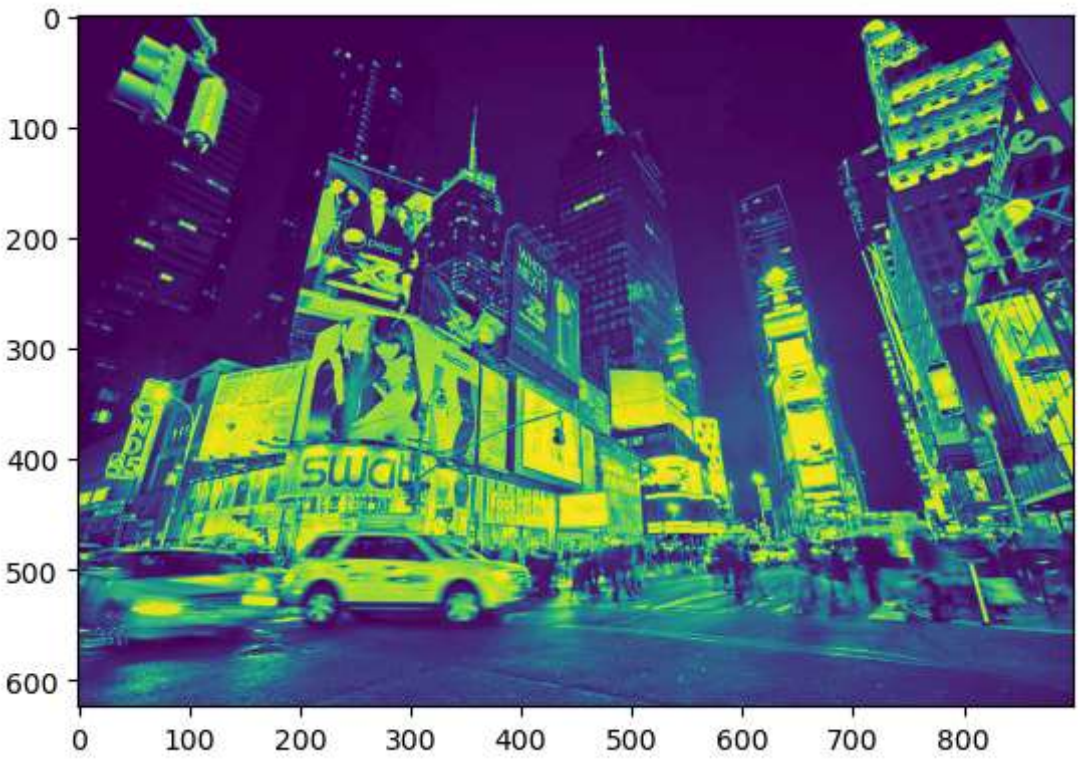
In [93]:
```
# R G B

plt.imshow(TS_img[:,:,2])
```

Out[93]: <matplotlib.image.AxesImage at 0x208d09ecc50>



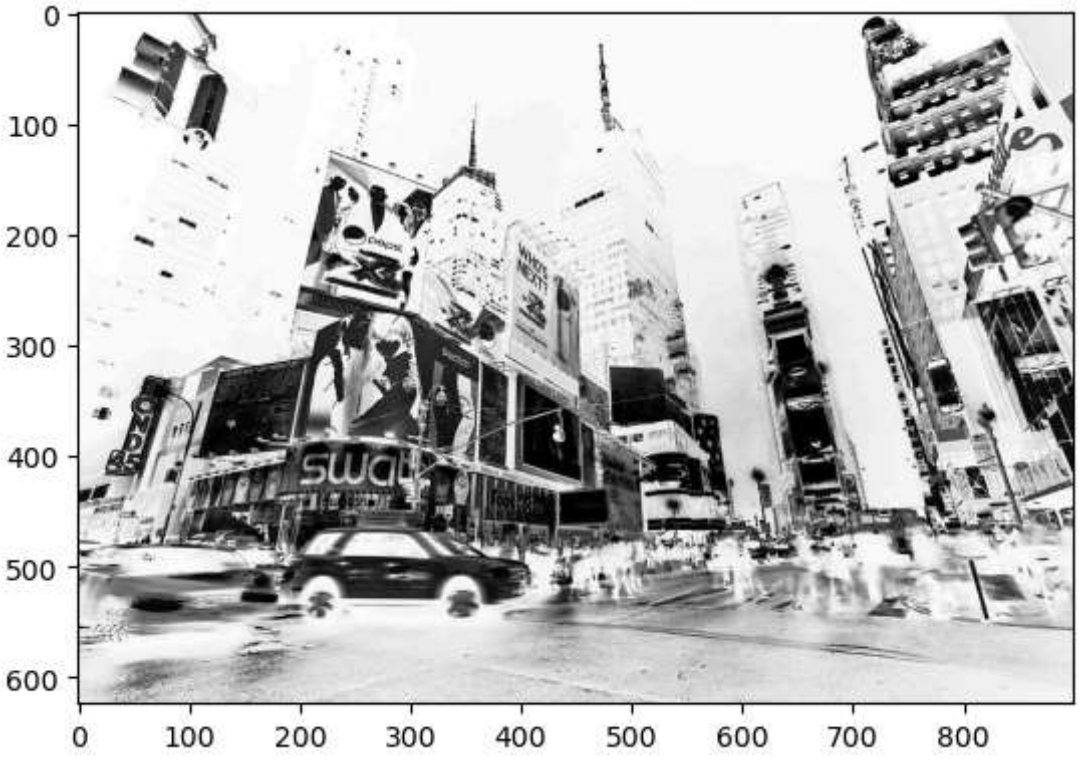

In [95]:
```
plt.imshow(TS_img[:,:,0])
```

Out[95]: <matplotlib.image.AxesImage at 0x208d01a50a0>



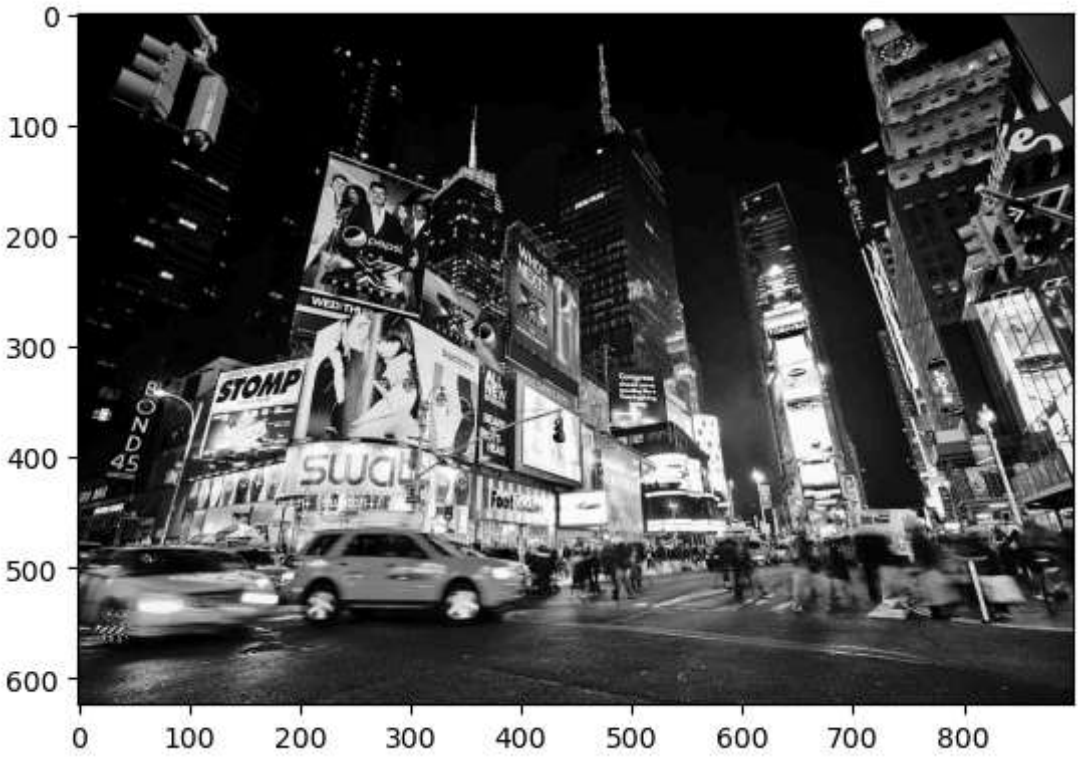

In [97]:
```
plt.imshow(TS_img[:,:,0], cmap='Greys')
```

Out[97]: <matplotlib.image.AxesImage at 0x208d3a15f70>



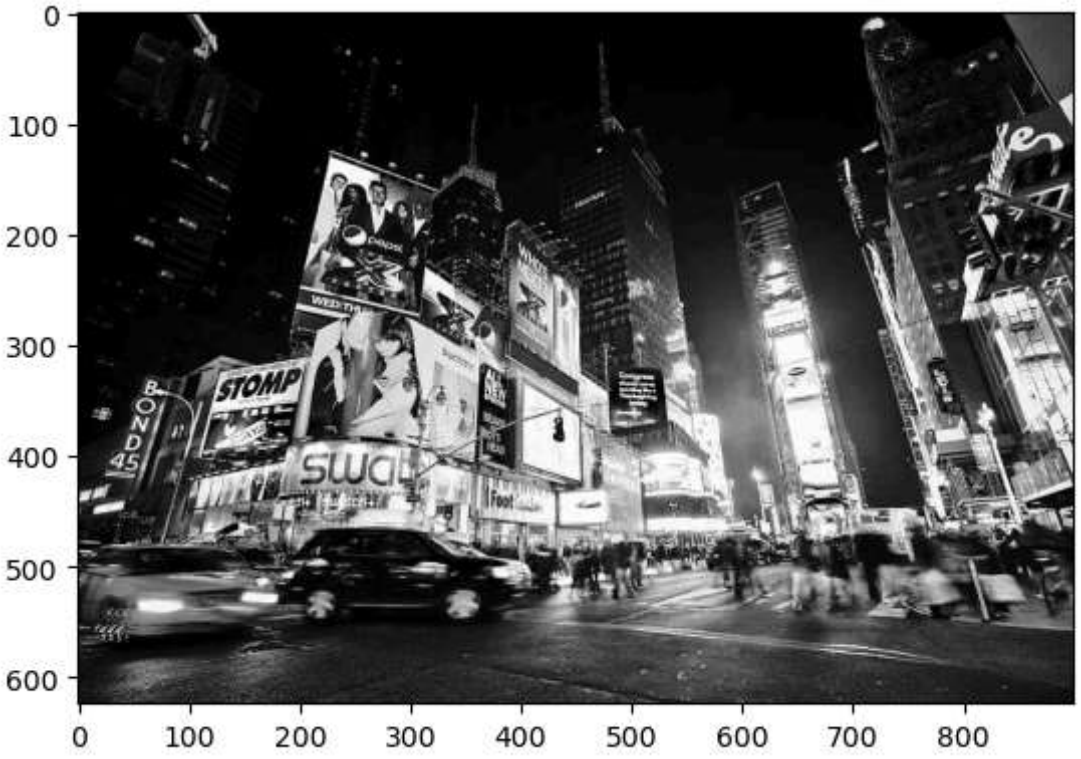

In [109…
```
plt.imshow(TS_img[:,:,1], cmap='grey')
```

Out[109… <matplotlib.image.AxesImage at 0x208d398e8a0>




In [113…
```
plt.imshow(TS_img[:,:,2], cmap='grey')
```

Out[113…
```
<matplotlib.image.AxesImage at 0x208d0a368d0>
```




In [121…
```
TS_img[:,:,0]
```

Out[121…
```
array([[ 0,  0,  0, ..., 12, 33,  9],
       [ 0,  0,  0, ..., 57, 18, 57],
       [ 0,  0,  0, ..., 10, 20, 16],
       ...,
       [30, 32, 35, ..., 16, 16, 15],
       [31, 35, 39, ..., 17, 16, 15],
       [33, 37, 40, ..., 17, 16, 15]], dtype=uint8)
```

In [123…
```
TS_img[:,:,1]
```

Out[123…
```
array([[ 0,  0,  0, ..., 29, 50, 24],
       [ 0,  0,  0, ..., 51,  9, 48],
       [ 0,  0,  0, ..., 38, 48, 42],
       ...,
       [21, 23, 26, ..., 16, 16, 15],
       [24, 28, 32, ..., 17, 16, 15],
       [26, 30, 33, ..., 17, 16, 15]], dtype=uint8)
```

In [125…
```
TS_img[:,:,2]
```

Out[125…
```
array([[ 0,  0,  0, ..., 47, 68, 43],
       [ 0,  0,  0, ..., 77, 36, 75],
       [ 0,  0,  0, ..., 52, 62, 57],
       ...,
       [12, 14, 17, ..., 16, 16, 15],
       [16, 20, 24, ..., 17, 16, 15],
       [18, 22, 25, ..., 17, 16, 15]], dtype=uint8)
```

In [131…
```
TS_img[:,:,1] = 0
TS_img
```

Out[131…

```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12,  0, 47],
        [33,  0, 68],
        [ 9,  0, 43]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57,  0, 77],
        [18,  0, 36],
        [57,  0, 75]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10,  0, 52],
        [20,  0, 62],
        [16,  0, 57]],

       ...,

       [[30,  0, 12],
        [32,  0, 14],
        [35,  0, 17],
        ...,
        [16,  0, 16],
        [16,  0, 16],
        [15,  0, 15]],

       [[31,  0, 16],
        [35,  0, 20],
        [39,  0, 24],
        ...,
        [17,  0, 17],
        [16,  0, 16],
        [15,  0, 15]],

       [[33,  0, 18],
        [37,  0, 22],
        [40,  0, 25],
        ...,
        [17,  0, 17],
        [16,  0, 16],
        [15,  0, 15]]], dtype=uint8)
```

In [133…

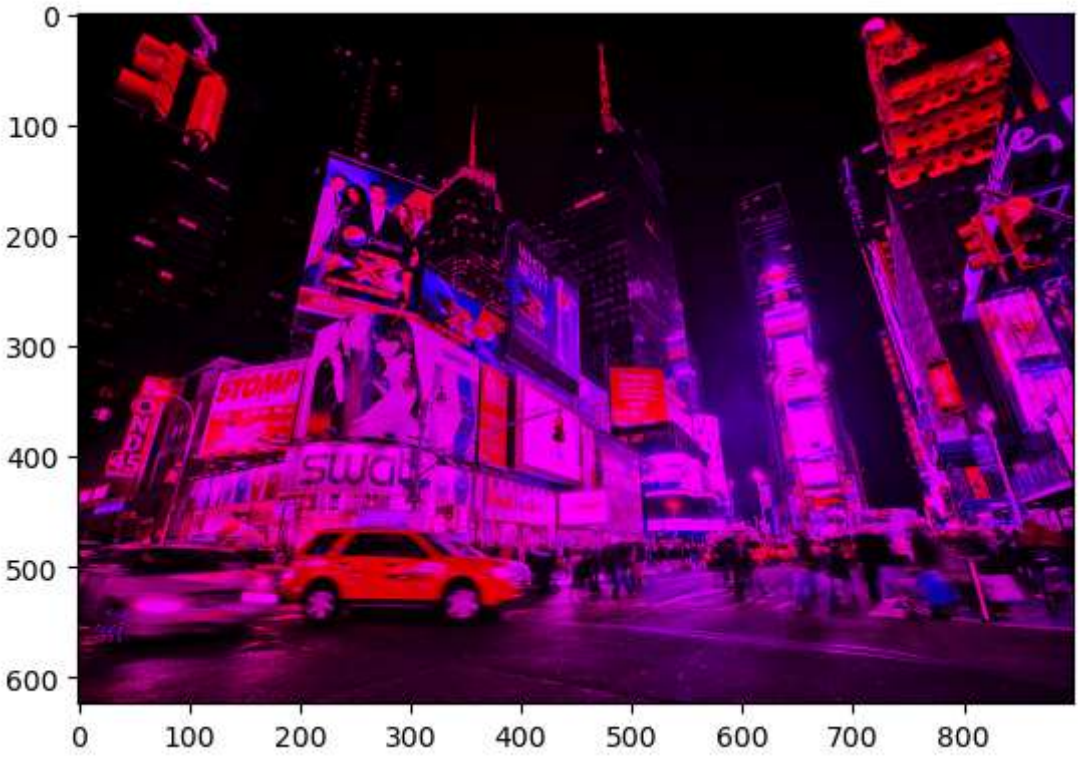
```
TS_img[:,:,1]
```

Out[133…

```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [135…
```
plt.imshow(TS_img)
```

Out[135…
```
<matplotlib.image.AxesImage at 0x208d4069cd0>
```




In [137…
```
TS_img[:,:,2]
```

Out[137…
```
array([[ 0,  0,  0, ..., 47, 68, 43],
       [ 0,  0,  0, ..., 77, 36, 75],
       [ 0,  0,  0, ..., 52, 62, 57],
       ...,
       [12, 14, 17, ..., 16, 16, 15],
       [16, 20, 24, ..., 17, 16, 15],
       [18, 22, 25, ..., 17, 16, 15]], dtype=uint8)
```

In [141…
```
TS_img[:,:,2]  = 0
TS_img
```

Out[141…

```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12,  0,  0],
        [33,  0,  0],
        [ 9,  0,  0]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57,  0,  0],
        [18,  0,  0],
        [57,  0,  0]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10,  0,  0],
        [20,  0,  0],
        [16,  0,  0]],

       ...,

       [[30,  0,  0],
        [32,  0,  0],
        [35,  0,  0],
        ...,
        [16,  0,  0],
        [16,  0,  0],
        [15,  0,  0]],

       [[31,  0,  0],
        [35,  0,  0],
        [39,  0,  0],
        ...,
        [17,  0,  0],
        [16,  0,  0],
        [15,  0,  0]],

       [[33,  0,  0],
        [37,  0,  0],
        [40,  0,  0],
        ...,
        [17,  0,  0],
        [16,  0,  0],
        [15,  0,  0]]], dtype=uint8)
```

In [143…

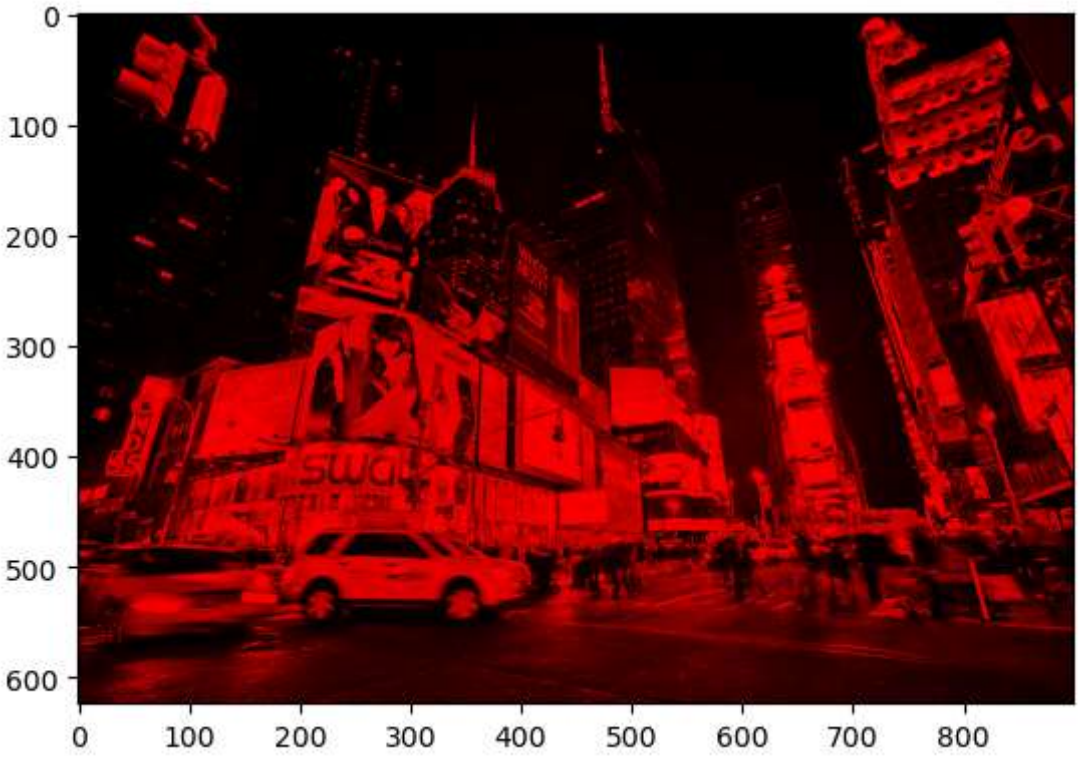
```
TS_img[:,:,2]
```

Out[143…

```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [145…
```
plt.imshow(TS_img)
```

Out[145…
```
<matplotlib.image.AxesImage at 0x208d3e00860>
```




In [147…
```
TG_arr
```

Out[147…

```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12, 29, 47],
        [33, 50, 68],
        [ 9, 24, 43]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57, 51, 77],
        [18,  9, 36],
        [57, 48, 75]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10, 38, 52],
        [20, 48, 62],
        [16, 42, 57]],

       ...,

       [[30, 21, 12],
        [32, 23, 14],
        [35, 26, 17],
        ...,
        [16, 16, 16],
        [16, 16, 16],
        [15, 15, 15]],

       [[31, 24, 16],
        [35, 28, 20],
        [39, 32, 24],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]],

       [[33, 26, 18],
        [37, 30, 22],
        [40, 33, 25],
        ...,
        [17, 17, 17],
        [16, 16, 16],
        [15, 15, 15]]], dtype=uint8)
```

In [149…

```
arr1 = np.asarray(TS_img)
```

In [151…

```
arr1
```

Out[151…

```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12,  0,  0],
        [33,  0,  0],
        [ 9,  0,  0]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57,  0,  0],
        [18,  0,  0],
        [57,  0,  0]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10,  0,  0],
        [20,  0,  0],
        [16,  0,  0]],

       ...,

       [[30,  0,  0],
        [32,  0,  0],
        [35,  0,  0],
        ...,
        [16,  0,  0],
        [16,  0,  0],
        [15,  0,  0]],

       [[31,  0,  0],
        [35,  0,  0],
        [39,  0,  0],
        ...,
        [17,  0,  0],
        [16,  0,  0],
        [15,  0,  0]],

       [[33,  0,  0],
        [37,  0,  0],
        [40,  0,  0],
        ...,
        [17,  0,  0],
        [16,  0,  0],
        [15,  0,  0]]], dtype=uint8)
```

In [153…

```
type(arr1)
```

Out[153…

```
numpy.ndarray
```

In [155…

```
arr1.shape
```

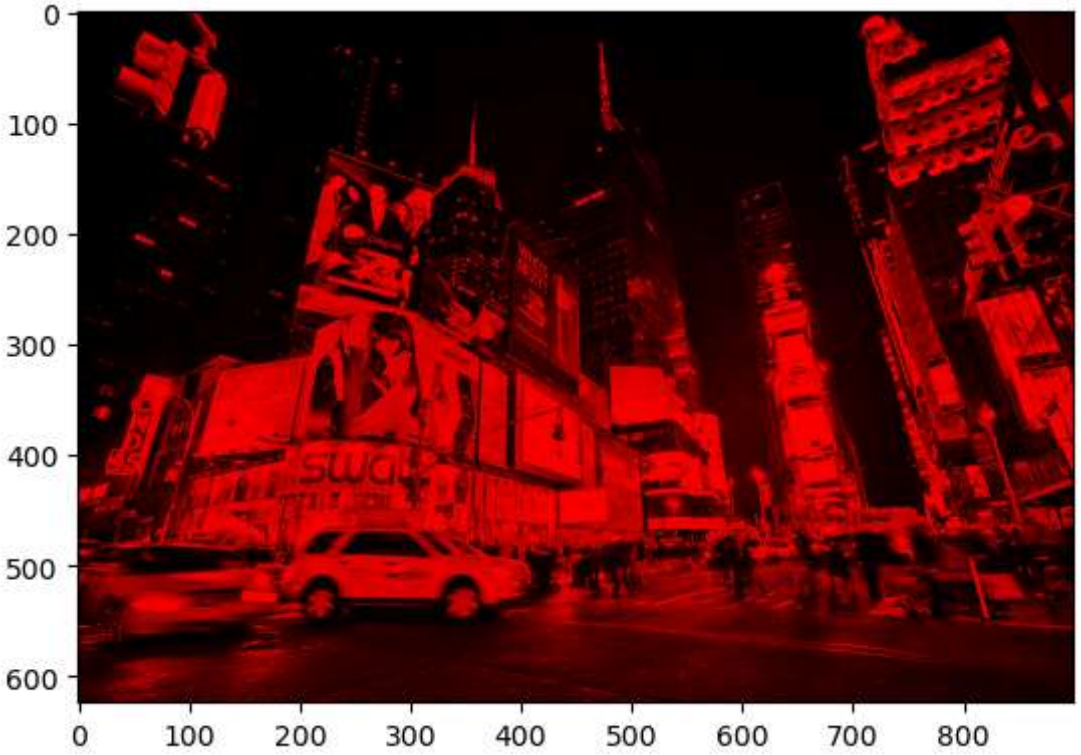
Out[155…

```
(624, 900, 3)
```

In [157…

```
plt.imshow(arr1)
```

Out[157… <matplotlib.image.AxesImage at 0x208d3e22030>




In [159…
```
TS_img1 = arr1.copy()
```

In [161…
```
TS_img1
```

Out[161…

```
array([[[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [12,  0,  0],
        [33,  0,  0],
        [ 9,  0,  0]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [57,  0,  0],
        [18,  0,  0],
        [57,  0,  0]],

       [[ 0,  0,  0],
        [ 0,  0,  0],
        [ 0,  0,  0],
        ...,
        [10,  0,  0],
        [20,  0,  0],
        [16,  0,  0]],

       ...,

       [[30,  0,  0],
        [32,  0,  0],
        [35,  0,  0],
        ...,
        [16,  0,  0],
        [16,  0,  0],
        [15,  0,  0]],

       [[31,  0,  0],
        [35,  0,  0],
        [39,  0,  0],
        ...,
        [17,  0,  0],
        [16,  0,  0],
        [15,  0,  0]],

       [[33,  0,  0],
        [37,  0,  0],
        [40,  0,  0],
        ...,
        [17,  0,  0],
        [16,  0,  0],
        [15,  0,  0]]], dtype=uint8)
```

In [163…

```
TS_img1[:,:,0] = 0
```

In [165…

```
TS_img1
```

Out[165…

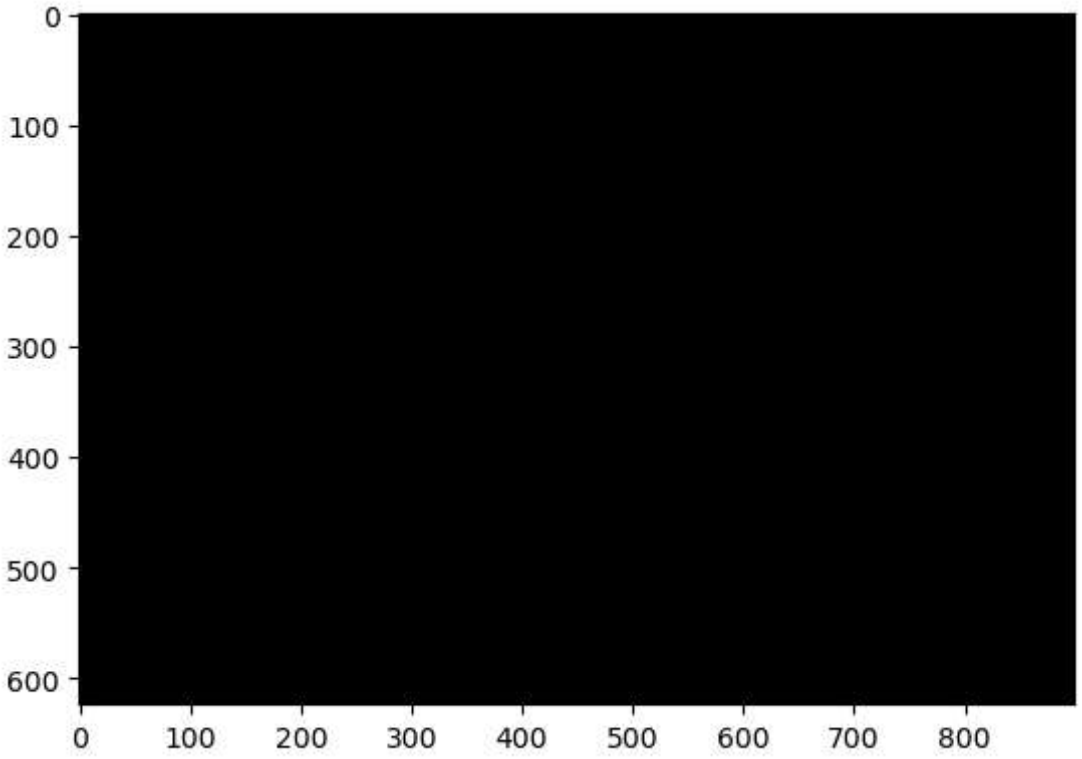
```
array([[[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       ...,

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]]], dtype=uint8)
```

In [167…

```
plt.imshow(TS_img1)
```

Out[167…

```
<matplotlib.image.AxesImage at 0x208d3e21cd0>
```




In [169…
```
TS_img1[:,:,1]
```

Out[169…
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [171…
```
TS_img1[:,:,1] = 0
```

In [173…
```
TS_img1
```

Out[173…

```
array([[[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       ...,

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]],

       [[0, 0, 0],
        [0, 0, 0],
        [0, 0, 0],
        ...,
        [0, 0, 0],
        [0, 0, 0],
        [0, 0, 0]]], dtype=uint8)
```

In [ ]:

```
plt.imshow(horse_img1)
```