In [29]:
```
import numpy as np
```

In [6]:
```
ones_arr = np.ones((5,5), dtype = int)
```

In [8]:
```
ones_arr
```

Out[8]:
```
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 [10]:
```
ones_arr * 255
```

Out[10]:
```
array([[255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255]])
```

In [41]:
```
import matplotlib.pyplot as plt
```

In [ ]:
```
matplotlib inline
```

In [28]:
```
from PIL import image
```

```
---------------------------------------------------------------------------
ImportError                               Traceback (most recent call last)
Cell In[28], line 1
----> 1 from PIL import image

ImportError: cannot import name 'image' from 'PIL' (C:\Users\azharalam\anaconda3
\Lib\site-packages\PIL\__init__.py)
```

In [36]:
```
pip install pillow
```

```
Requirement already satisfied: pillow in c:\users\azharalam\anaconda3\lib\site-pa
ckages (10.4.0)
Note: you may need to restart the kernel to use updated packages.
```

In [37]:
```
from PIL import Image
```

In [19]:
```
elephant = Image.open(r'C:\AI Course Naresh\elephant.jpeg')
```

In [21]:
```
elephant
```

Out[21]:

In [17]:
```
horse_img = Image.open(r'C:\AI Course Naresh\horse.jpeg')
horse_img
```

Out[17]:

In [23]:
```
type(horse_img)
```

Out[23]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [75]:
```
horse_arr = np.asarray(horse_img)
horse_arr
```

Out[75]:
```
array([[[ 15,  17,  29],
        [ 15,  17,  29],
        [ 15,  17,  29],
        ...,
        [ 28,  36,  39],
        [ 30,  35,  39],
        [ 30,  33,  38]],

       [[ 15,  17,  29],
        [ 15,  17,  29],
        [ 15,  17,  29],
        ...,
        [ 24,  32,  35],
        [ 25,  30,  34],
        [ 24,  29,  33]],

       [[ 15,  17,  29],
        [ 15,  17,  29],
        [ 15,  17,  29],
        ...,
        [ 18,  26,  29],
        [ 19,  24,  28],
        [ 19,  24,  28]],

       ...,

       [[ 16,  10,   0],
        [ 64,  58,  36],
        [ 27,  21,   0],
        ...,
        [ 31,  42,  34],
        [ 43,  54,  46],
        [ 36,  47,  39]],

       [[ 48,  43,  23],
        [ 25,  20,   0],
        [ 61,  56,  36],
        ...,
        [ 31,  42,  34],
        [ 43,  54,  46],
        [ 37,  48,  40]],

       [[ 65,  62,  45],
        [120, 117, 100],
        [ 52,  49,  32],
        ...,
        [ 27,  38,  30],
        [ 36,  47,  39],
        [ 30,  41,  33]]], dtype=uint8)
```

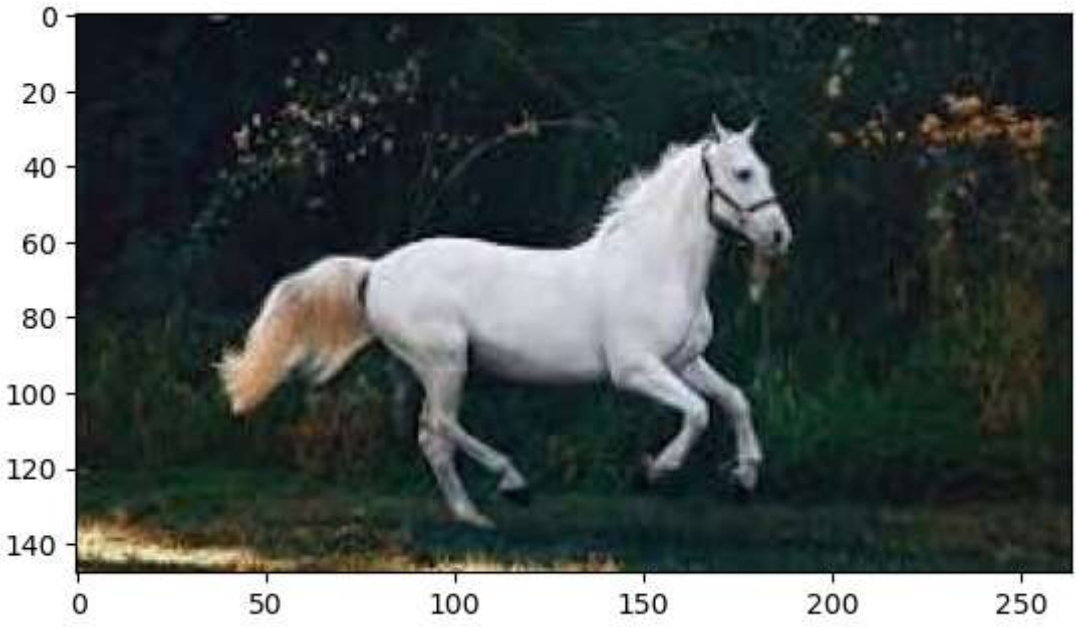
In [33]:
```
type(horse_arr)
```

Out[33]:
```
numpy.ndarray
```

In [61]:
```
plt.show(horse_img)
```

In [43]:
```
plt.imshow(horse_arr)
```

Out[43]:
```
<matplotlib.image.AxesImage at 0x23c3bde7d10>
```



In [65]:
```
plt.imshow(horse_img)
```

Out[65]: <matplotlib.image.AxesImage at 0x23c3df82660>

In [67]:
```
plt.show(horse_arr)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[67], line 1
----> 1 plt.show(horse_arr)

File ~\anaconda3\Lib\site-packages\matplotlib\pyplot.py:612, in show(*args, **kwa
rgs)
    568 """
    569 Display all open figures.
    570
   (...)
    609 explicitly there.
    610 """
    611 _warn_if_gui_out_of_main_thread()
--> 612 return _get_backend_mod().show(*args, **kwargs)

File ~\anaconda3\Lib\site-packages\matplotlib_inline\backend_inline.py:98, in sho
w(close, block)
     95 show._to_draw = []
     96 # only call close('all') if any to close
     97 # close triggers gc.collect, which can be slow
---> 98 if close and Gcf.get_all_fig_managers():
     99     matplotlib.pyplot.close('all')

ValueError: The truth value of an array with more than one element is ambiguous.
Use a.any() or a.all()
```

In [45]:
```
horse_arr.shape
```

Out[45]:
```
(148, 264, 3)
```

In [69]:
```
horse_red = horse_arr.copy()
```

In [71]:
```
horse_red
```

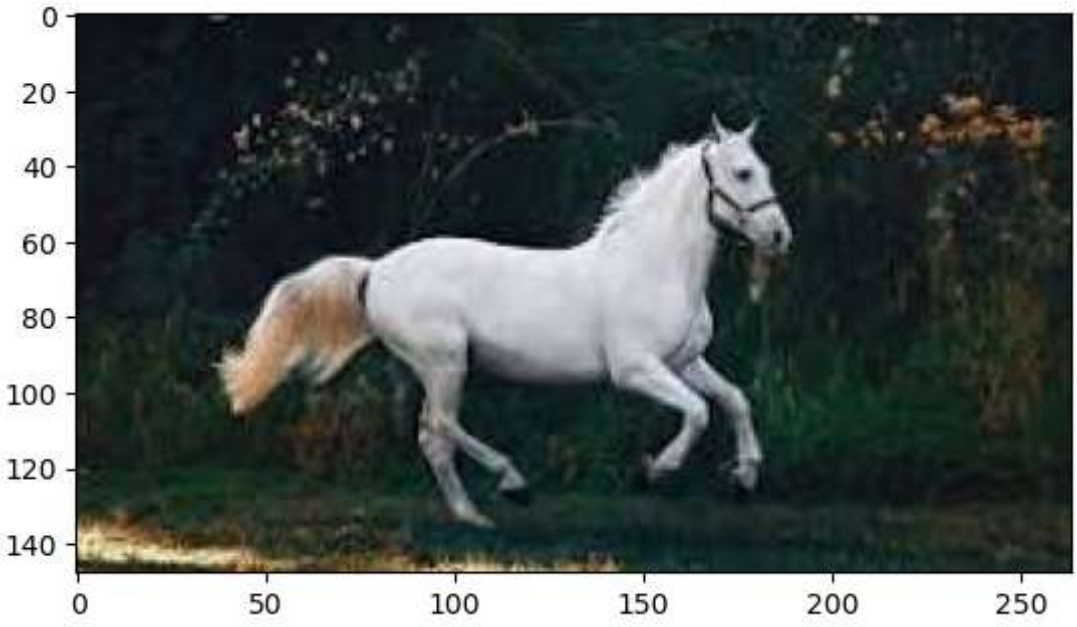
Out[71]:
```
array([[[ 15,  17,  29],
        [ 15,  17,  29],
        [ 15,  17,  29],
        ...,
        [ 28,  36,  39],
        [ 30,  35,  39],
        [ 30,  33,  38]],

       [[ 15,  17,  29],
        [ 15,  17,  29],
        [ 15,  17,  29],
        ...,
        [ 24,  32,  35],
        [ 25,  30,  34],
        [ 24,  29,  33]],

       [[ 15,  17,  29],
        [ 15,  17,  29],
        [ 15,  17,  29],
        ...,
        [ 18,  26,  29],
        [ 19,  24,  28],
        [ 19,  24,  28]],

       ...,

       [[ 16,  10,   0],
        [ 64,  58,  36],
        [ 27,  21,   0],
        ...,
        [ 31,  42,  34],
        [ 43,  54,  46],
        [ 36,  47,  39]],

       [[ 48,  43,  23],
        [ 25,  20,   0],
        [ 61,  56,  36],
        ...,
        [ 31,  42,  34],
        [ 43,  54,  46],
        [ 37,  48,  40]],

       [[ 65,  62,  45],
        [120, 117, 100],
        [ 52,  49,  32],
        ...,
        [ 27,  38,  30],
        [ 36,  47,  39],
        [ 30,  41,  33]]], dtype=uint8)
```

In [84]:
```
horse_arr == horse_red
```

Out[84]:
```
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 [86]:
```
plt.imshow(horse_red)
```

Out[86]:
```
<matplotlib.image.AxesImage at 0x23c3e056d80>
```



In [88]:
```
horse_red.shape
```

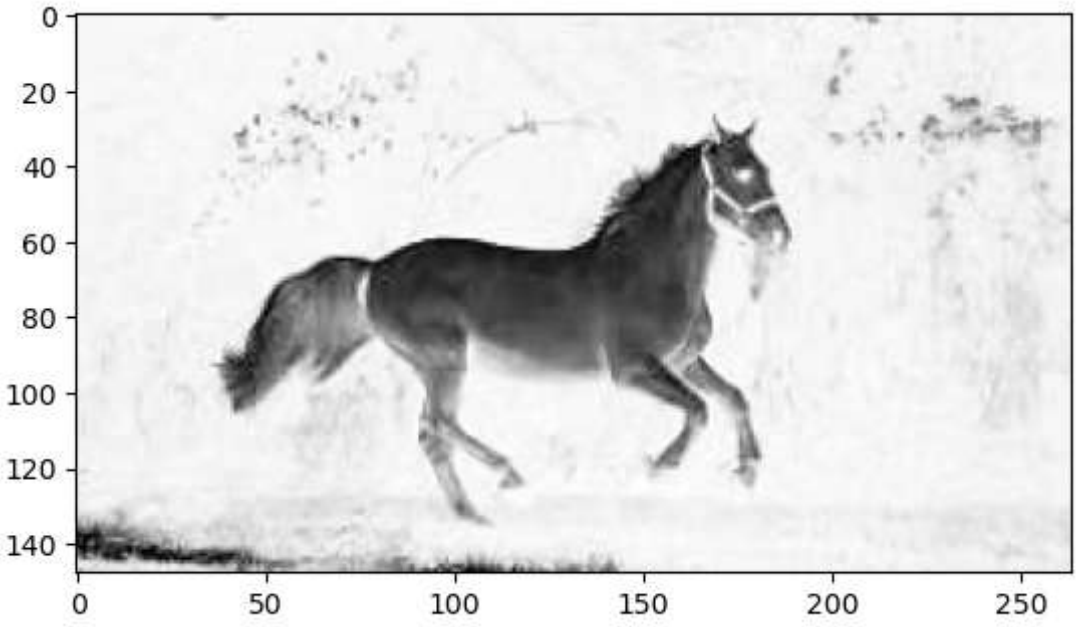
Out[88]:
```
(148, 264, 3)
```

In [92]:
```
plt.imshow(horse_red[:,:, 0])
```

Out[92]:
```
<matplotlib.image.AxesImage at 0x23c3e276ea0>
```

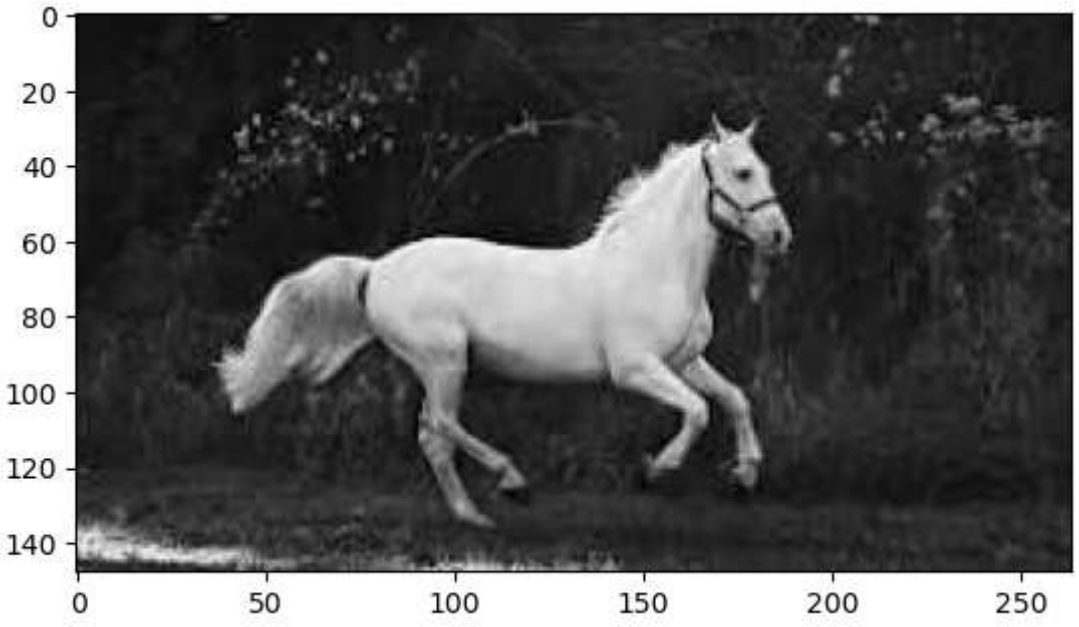
In [94]:
```
plt.imshow(horse_red[:,:,0], cmap = 'Greys')
```

Out[94]:
```
<matplotlib.image.AxesImage at 0x23c3e275070>
```



In [96]:
```
plt.imshow(horse_red[:,:, 1], cmap = 'grey')
```

Out[96]: <matplotlib.image.AxesImage at 0x23c3e31fb60>



In [98]:
```
plt.imshow(horse_red[:,:,1], cmap='YlGn')
```

Out[98]: <matplotlib.image.AxesImage at 0x23c3e250e30>

In [ ]:

In [ ]:

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