Image Processing

1.Using OpenCV

In [40]:
```python
import sys
!{sys.executable} -m  pip install opencv-python
```

Requirement already satisfied: opencv-python in s:\anaconda\lib\site-packages (4.5.5.64)
Requirement already satisfied: numpy>=1.19.3 in s:\anaconda\lib\site-packages (from opencv-python) (1.20.3)

In [42]:
```python
#Importing required Libraries

import numpy as np
import cv2
import matplotlib.pyplot as plt
```
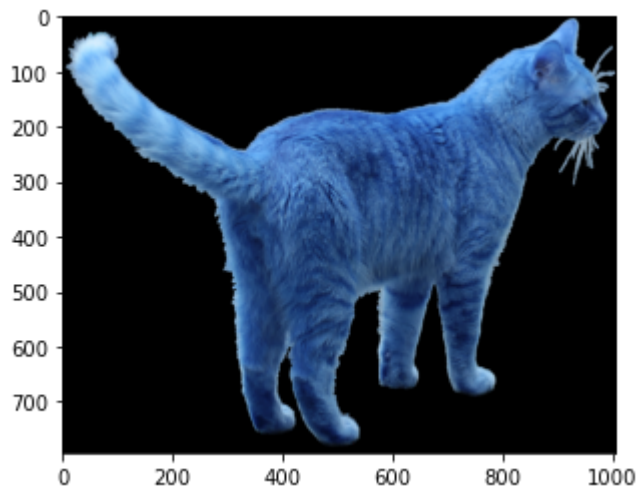
In [43]:
```python
#read Image using imread function
img = cv2.imread("cat_image.png")
```

In [44]:
```python
#printing type and shape of the array
print(type(img))
print(img.shape)
```

```
<class 'numpy.ndarray'>
(793, 1007, 3)
```
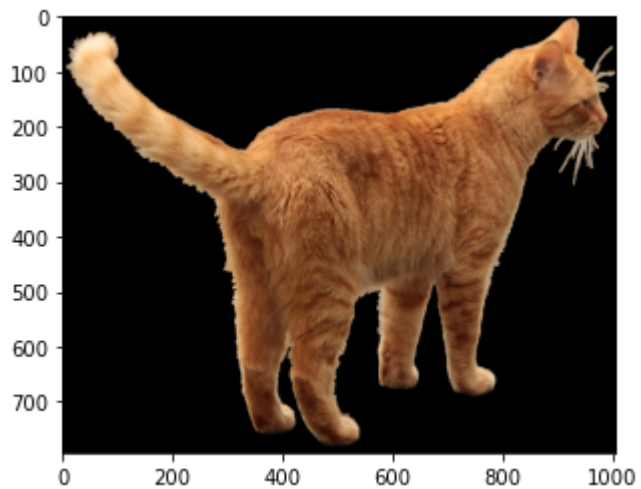
In [45]:
```python
#Plottig the result
plt.imshow(img)
```

Out[45]: `<matplotlib.image.AxesImage at 0x260da9ed580>`

In [46]:
```python
#Convert Image from BRG to RGB using cvtColor function
img_rgb = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
plt.imshow(img_rgb)
```

Out[46]: <matplotlib.image.AxesImage at 0x260daaa8760>

In [48]:
```python
#Image Resize
scale = 20
new_width = int(img_rgb.shape[1] * scale / 100)
new_height = int(img_rgb.shape[0] * scale / 100)
dim = (new_width,new_height)
```

```
resized = cv2.resize(img_rgb, dim, interpolation=cv2.INTER_AREA)
plt.imshow(resized)
print(resized.shape)
```
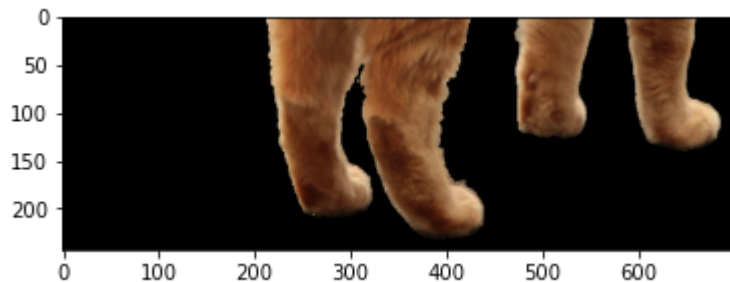
(158, 201, 3)

In [49]:
```
#Cropping the Image
img_crop = img_rgb[550:990, 100:800]
plt.imshow(img_crop)
print(img_crop.shape)
```

(243, 700, 3)

In [50]:
```
#Saving Image
cv2.imwrite('pro_1.png',img)
```

```
cv2.imwrite('pro_2.png',resized)
cv2.imwrite('pro_3.png',img_crop)
```

Out[50]:   True

2.Using Scikit-image

In [51]:
```
#Importing Required Libraries
import numpy as np
import skimage
from skimage import io
import matplotlib.pyplot as plt
```
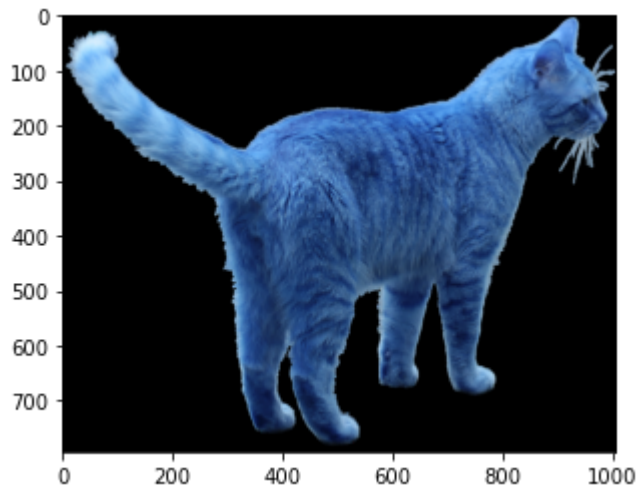
In [52]:
```
#Read Image using imread() function
img_1 = io.imread("cat_image.png")
```

In [53]:
```
#Printing type and shape of array
print(type(img_1))
print(img_1.shape)
```

```
<class 'numpy.ndarray'>
(793, 1007, 4)
```

In [54]:
```
#Plotting the result
plt.imshow(img)
```
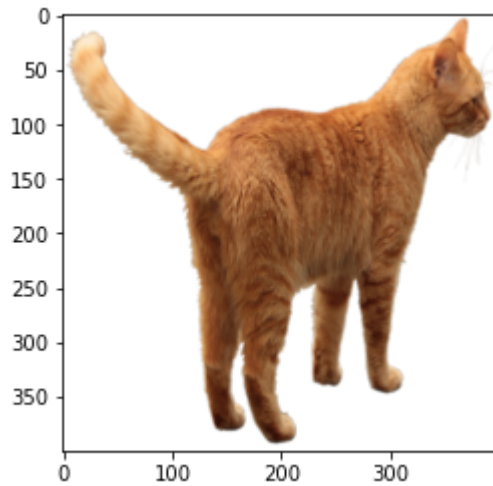
Out[54]:   <matplotlib.image.AxesImage at 0x260dab5ab80>

In [55]:
```python
#Resizing the image
from skimage.transform import resize
resized  = resize(img_1, (400,400))
plt.imshow(resized)
print(resized.shape)
```
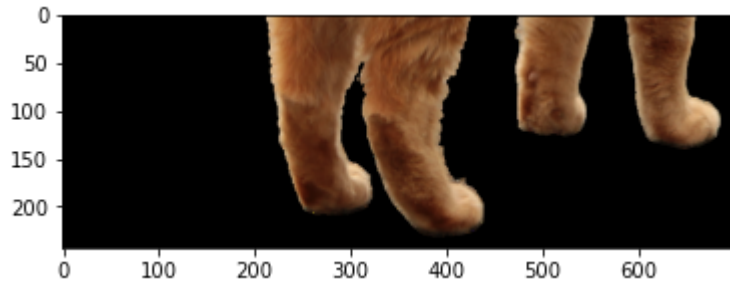
(400, 400, 4)

In [56]:
```python
#Cropping the Image
img_crop = img_rgb[550:990, 100:800]
```

```
plt.imshow(img_crop)
print(img_crop.shape)
```

(243, 700, 3)

In [57]:
```
#Saving image using Imsave
io.imsave('pro_1.png',img)
io.imsave('pro_2.png',resized)
io.imsave('pro_3.png',img_crop)
```

Lossy conversion from float64 to uint8. Range [0, 1]. Convert image to uint8 prior to saving to suppress this warning.

3.Using Pillow

In [58]:
```
#Improting Libraries
import numpy as np
from PIL import Image
import matplotlib.pyplot as plt
```

In [59]:
```
#Read the Image
img_2 = Image.open("cat_image.png")
```
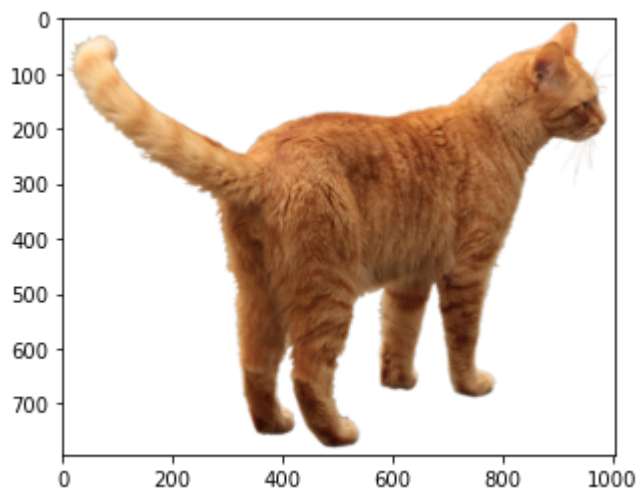
In [60]:
```
#Printing the type and the shape of the image
print(type(img_2))
print(img_2.size)
```

<class 'PIL.PngImagePlugin.PngImageFile'>
(1007, 793)

In [61]:
```
#plotting the result
```

```
plt.imshow(img_2)
```
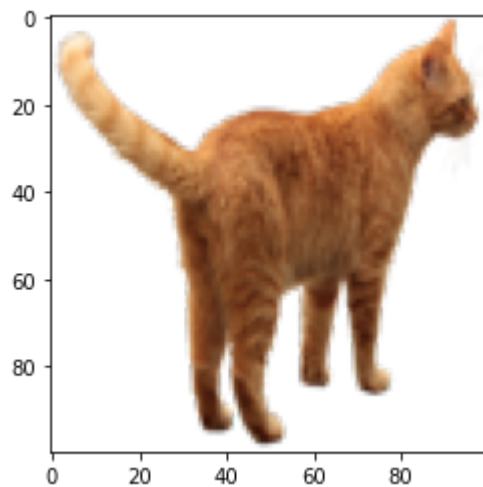
Out[61]:   <matplotlib.image.AxesImage at 0x260daeee460>

In [62]:
```
#Resizing the image
size = (100,100)

resized  = img_2.resize(size)
plt.imshow(resized)
print(resized.size)
```
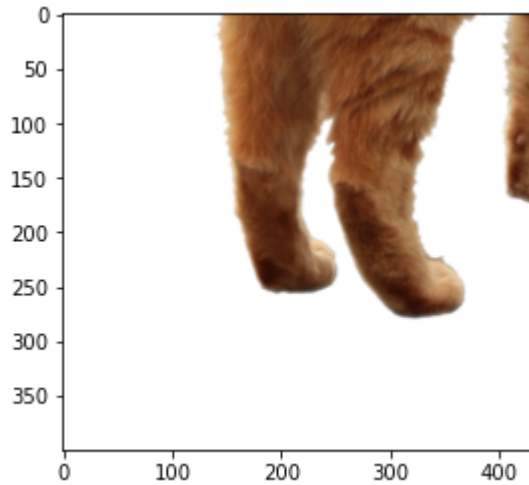
(100, 100)

In [63]:
```python
#Cropping the Image
img_crop = img_2.crop((170,500, 600,900))
plt.imshow(img_crop)
print(img_crop.size)
```

(430, 400)

In [64]:
```python
#Saving Image
img_2.save('pr0_4.png')
resized.save('pr0_5.png')
img_crop.save('pr0_6.png')
```

In [81]: