In [1]:
```
import cv2
import numpy as np
import matplotlib.pyplot as plt
```

In [3]:
```
# read an image
path = 'car.jpg'
image = cv2.imread(path)
```

In [16]:
```
# display an image
cv2.imshow('car image',image)
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [6]:
```
image.shape
```

Out[6]: (288, 512, 3)

In [8]:
```
# Gray scale image

img_gray  = cv2.imread(path,cv2.IMREAD_GRAYSCALE)
cv2.imshow('Grayscale car image',img_gray)
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [9]:
```
img_gray.shape
```

Out[9]: (288, 512)

In [13]:

```
# image slicing
image = cv2.imread(path)
crop = image[100:200,50:150]
cv2.imshow('crop image',crop)
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [15]:

```
image.shape[0]
```

Out[15]: 288

In [21]:

```
# image resize

scale = 60
image = cv2.imread(path)
width = int(image.shape[1]*scale/100)
height = int(image.shape[0]*scale/100)

dim = (width,height)

# resize
img_resized = cv2.resize(image,dim,interpolation = cv2.INTER_AREA)
cv2.imshow('resized image',img_resized)
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [22]:

```
img_resized.shape
```

Out[22]: (172, 307, 3)

In [23]:

```
# rotate an image
image = cv2.imread(path)
h,w,c = image.shape

scale = 1
center = (w/2,h/2)
angle = 90
m = cv2.getRotationMatrix2D(center,angle,scale)
img_rotate = cv2.warpAffine(image,m,(h,w))
cv2.imshow('rotated image',img_rotate)
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [ ]:

```

```

In [27]:

```
# finding adges from an image
image = cv2.imread(path)
edges = cv2.Canny(image,150,250)
cv2.imshow('canny image',edges)
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [35]:

```
# blur filter on image
image = cv2.imread(path)
blur = cv2.blur(image,(4,4))
cv2.imshow('Blurred image',np.hstack((image,blur)))
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [43]:

```
# Gaussian  / mdedian filter to blur
image = cv2.imread(path)
dst = median = cv2.medianBlur(image,5)
cv2.imshow('Median Blurred image',np.hstack((image,dst)))
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [49]:

```
# bilateral filter
image = cv2.imread(path)
bilateral_blur = cv2.bilateralFilter(image,9,25,25)
cv2.imshow('Bilateral filter image',np.hstack((image,bilateral_blur)))
cv2.waitKey(1)
cv2.destroyAllWindows()

```

In [53]:

```
# Box filter
image = cv2.imread(path)
box_img = cv2.boxFilter(image,0,(3,3),(-1,-1))
cv2.imshow('box filter image',np.hstack((image,box_img)))
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [77]:
```
# image binarization

image = cv2.imread(path)
img_gray  = cv2.imread(path,cv2.IMREAD_GRAYSCALE)
value,thresh = cv2.threshold(img_gray,100,250,cv2.THRESH_BINARY)
cv2.imshow('Binary image',thresh)
cv2.waitKey(1)
cv2.destroyAllWindows()
```

In [ ]:
```

```

In [86]:
```
# draw a line
image = cv2.imread(path)
cv2.line(image,(0,0),(170,270),(255,255,0),5)
cv2.imshow('line on image',image)
cv2.waitKey(1)
cv2.destroyAllWindows()

```

In [97]:
```
# draw a line
image = cv2.imread(path)
cv2.rectangle(image,(15,20),(500,230),(170,25,215),3)
cv2.imshow('line on image',image)
cv2.waitKey(1)
cv2.destroyAllWindows()

```

In [ ]:
```

```

In [ ]:
```

```