

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]: 1. Write a python program to read an image and do the following:
```

- Get the information related to the image.
- Rotate the image to specific angle given by user.
- Flip the image to left-right **and** top-bottom.
- Resize the image to new size.
- Thumbnail of your image.
- convert image to grey scale **and** black-white.
- Apply different filters on the image.

```
In [ ]:
```

```
In [1]: from PIL import Image
```

```
In [104]: img=Image.open("k11.jpeg")  
img.show()
```

```
In [106]: print(img.size)
```

```
(1152, 864)
```

```
In [6]: print(img.format)
```

```
JPEG
```

```
In [7]: print(img.filename)
```

```
k11.jpeg
```

```
In [8]: print(img.height)
```

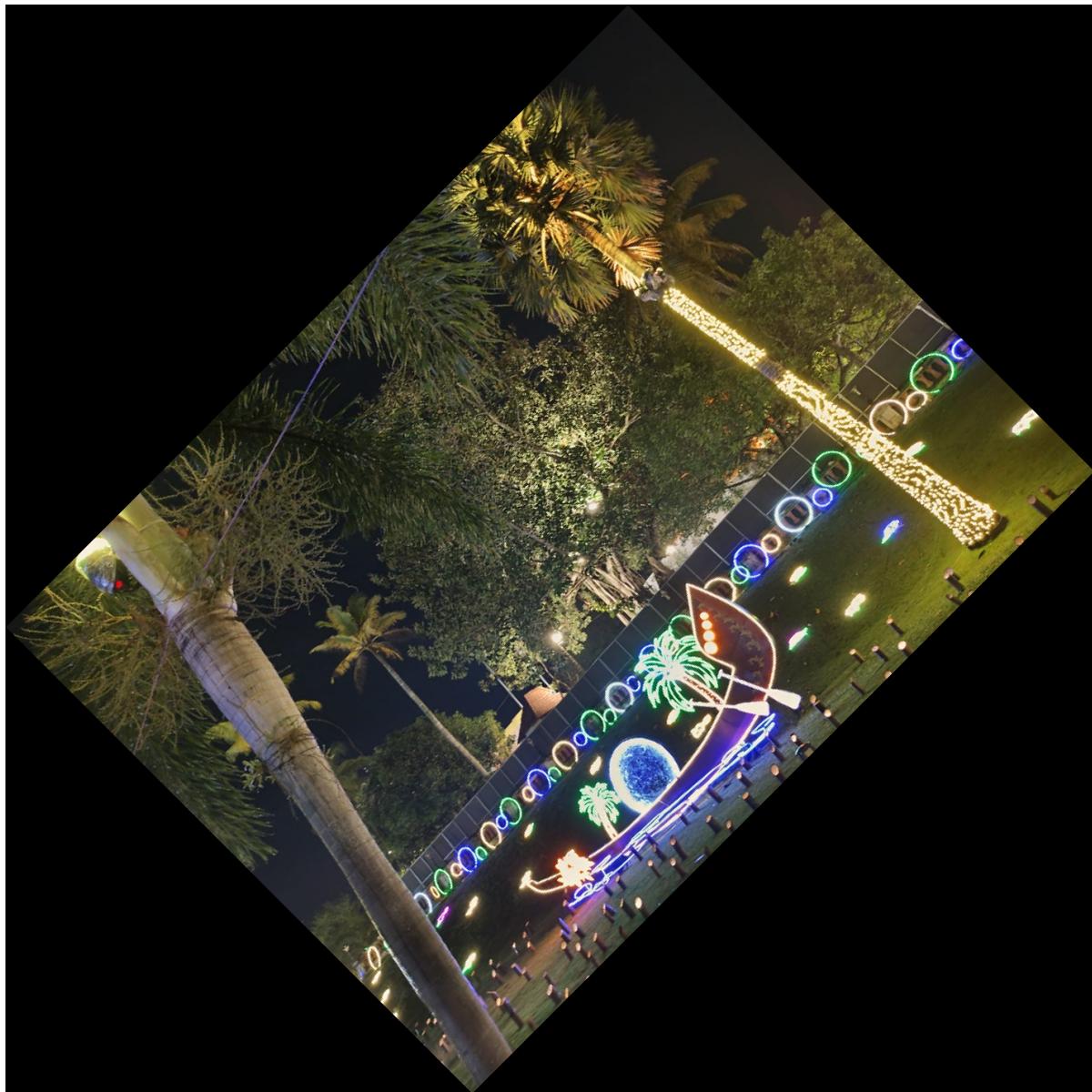
```
864
```

```
In [9]: print(img.width)
```

```
1152
```

```
In [20]: im1=img.rotate(45,expand=1)  
im1
```

Out[20]:



```
In [18]: ver_img=img.transpose(method=Image.FLIP_TOP_BOTTOM)  
ver_img
```

Out[18]:



In [23]: `ver_img = img.transpose(Image.FLIP_LEFT_RIGHT)`
`ver_img`

Out[23]:



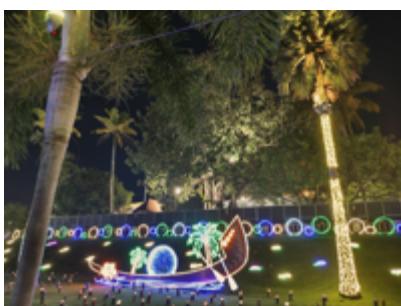
```
In [28]: new_size=(200,100)
r_img=img.resize(new_size)
r_img
```

Out[28]:



```
In [30]: thum_size=(200,300)
img.thumbnail(thum_size)
img
```

Out[30]:



In []:

```
In [33]: r,g,b=img.split()
```

```
r
```

Out[33]:



```
In [37]: from PIL import ImageFilter  
img=img.filter(ImageFilter.BLUR)  
img
```

Out[37]:



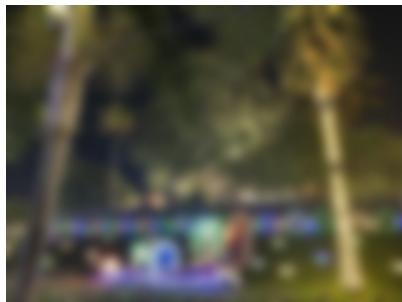
```
In [54]: from PIL import Image, ImageFilter  
img1 = img.filter(ImageFilter.BoxBlur(2))  
img1
```

Out[54]:



```
In [53]: from PIL import Image, ImageFilter  
img1 = img.filter(ImageFilter.GaussianBlur(2))  
img1
```

Out[53]:



```
In [56]: img2=img.convert('L')  
img2
```

Out[56]:



In [58]: `img3=img.convert('1')`
`img3`

Out[58]:



In [59]:

In []: 2. Write a python program to read an image **and** do the following:
• Convert image to numpy array.
• Get the attributes of that image.
• Flip the image to top-bottom **and** opposite direction using array slicing.
• Crop portion of image using array slicing.
• Blur the image using Array slicing.

In [65]: `import numpy as np`
`import matplotlib.pyplot as plt`

In [67]: `img_array=np.array(img)`

In [69]: `print(img_array)`

```
[[[21 23 22]
 [21 23 22]
 [21 23 22]
 ...
 [21 22 24]
 [21 22 24]
 [21 22 24]]
```

```
[[21 23 22]
 [21 23 22]
 [21 23 22]
 ...
 [21 22 24]
 [21 22 24]
 [21 22 24]]
```

```
[[21 23 20]
 [21 23 20]
 [21 23 20]
 ...
 [21 22 24]
 [21 22 24]
 [21 22 24]]
```

```
...
```

```
[[59 64 41]
 [58 63 41]
 [57 62 42]
 ...
 [85 80 22]
 [85 80 22]
 [85 80 22]]
```

```
[[59 64 42]
 [59 64 42]
 [59 64 44]
 ...
 [82 80 21]
 [82 80 21]
 [82 80 21]]
```

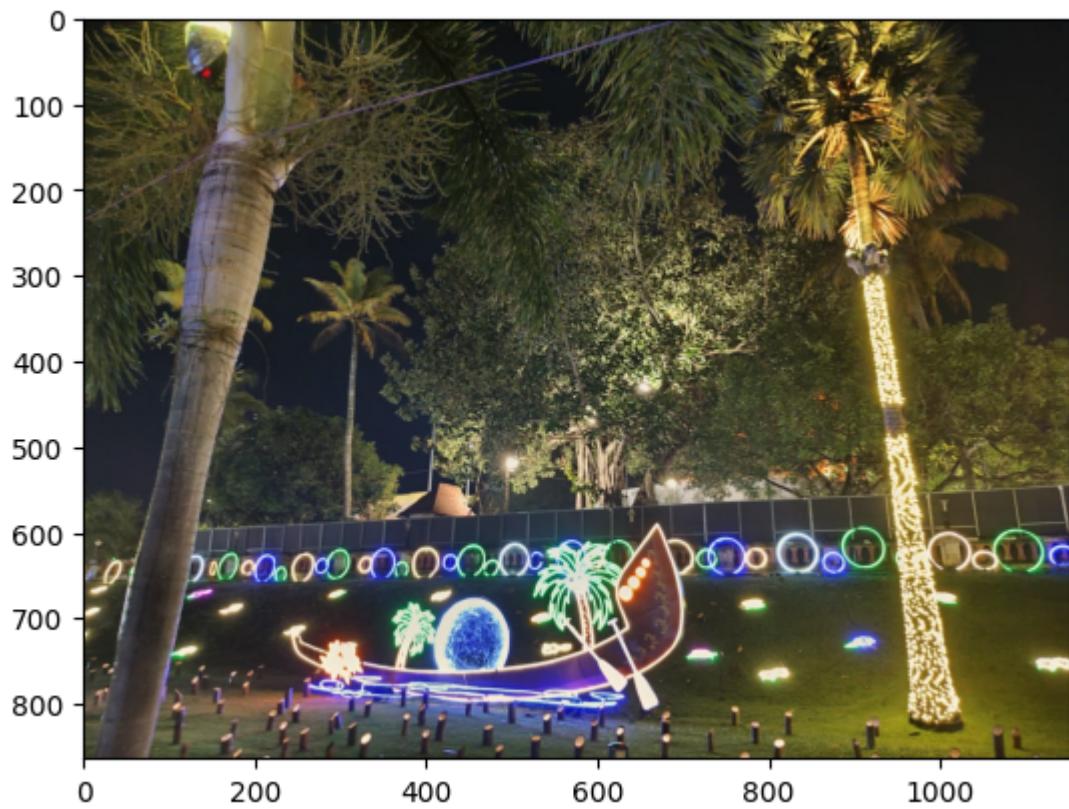
```
[[61 66 44]
 [61 66 44]
 [62 67 47]
 ...
 [82 80 21]
 [82 80 21]
 [82 80 21]]]
```

```
In [70]: print(img_array.shape)
```

```
(864, 1152, 3)
```

```
In [71]: plt.imshow(img_array)
```

```
Out[71]: <matplotlib.image.AxesImage at 0x1f721a88b60>
```



```
In [72]: print(img_array.ndim)
```

```
3
```

```
In [73]: print(img_array.size)
```

```
2985984
```

```
In [76]: print(img_array.T)
```

```
[[[21 21 21 ... 59 59 61]
 [21 21 21 ... 58 59 61]
 [21 21 21 ... 57 59 62]
 ...
 [21 21 21 ... 85 82 82]
 [21 21 21 ... 85 82 82]
 [21 21 21 ... 85 82 82]]]

[[23 23 23 ... 64 64 66]
 [23 23 23 ... 63 64 66]
 [23 23 23 ... 62 64 67]
 ...
 [22 22 22 ... 80 80 80]
 [22 22 22 ... 80 80 80]
 [22 22 22 ... 80 80 80]]]

[[22 22 20 ... 41 42 44]
 [22 22 20 ... 41 42 44]
 [22 22 20 ... 42 44 47]
 ...
 [24 24 24 ... 22 21 21]
 [24 24 24 ... 22 21 21]
 [24 24 24 ... 22 21 21]]]
```

```
In [77]: print(img_array.dtype)
```

```
uint8
```

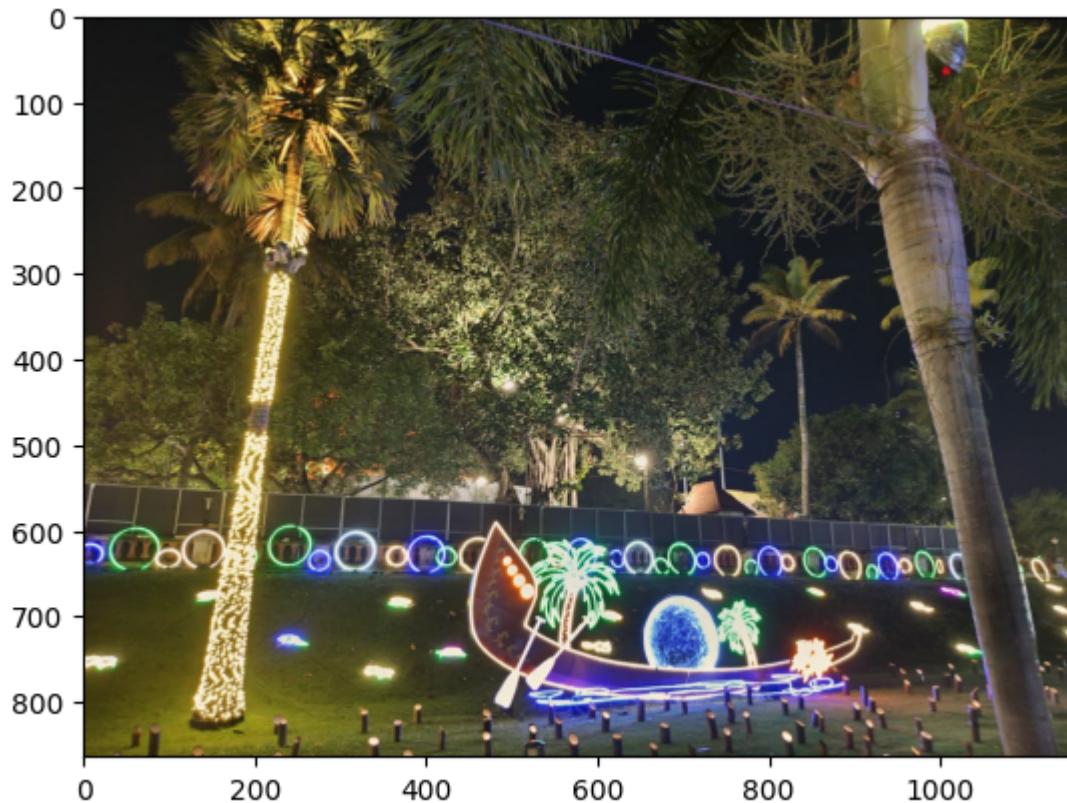
```
In [78]: plt.imshow(img_array[:, :, :-1])
```

```
Out[78]: <matplotlib.image.AxesImage at 0x1f721b32420>
```



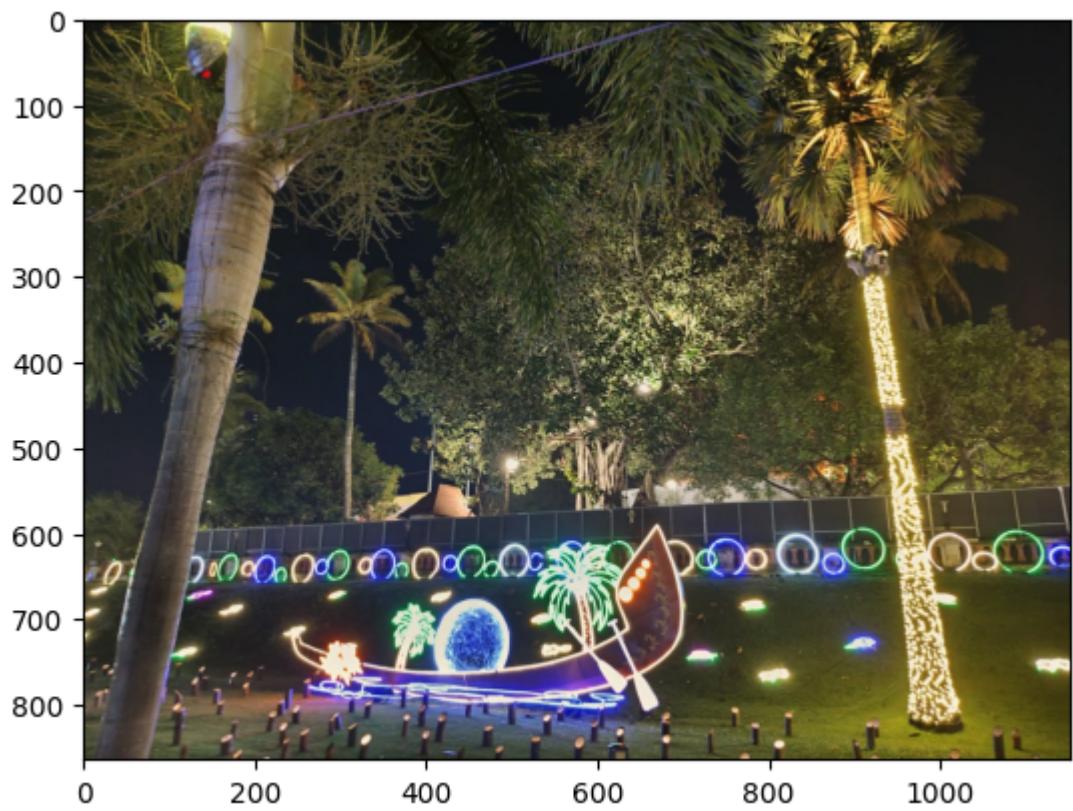
```
In [80]: plt.imshow(img_array[:, ::-1, :])
```

```
Out[80]: <matplotlib.image.AxesImage at 0x1f721aa5820>
```



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

```
Out[81]: <matplotlib.image.AxesImage at 0x1f721b8ecc0>
```



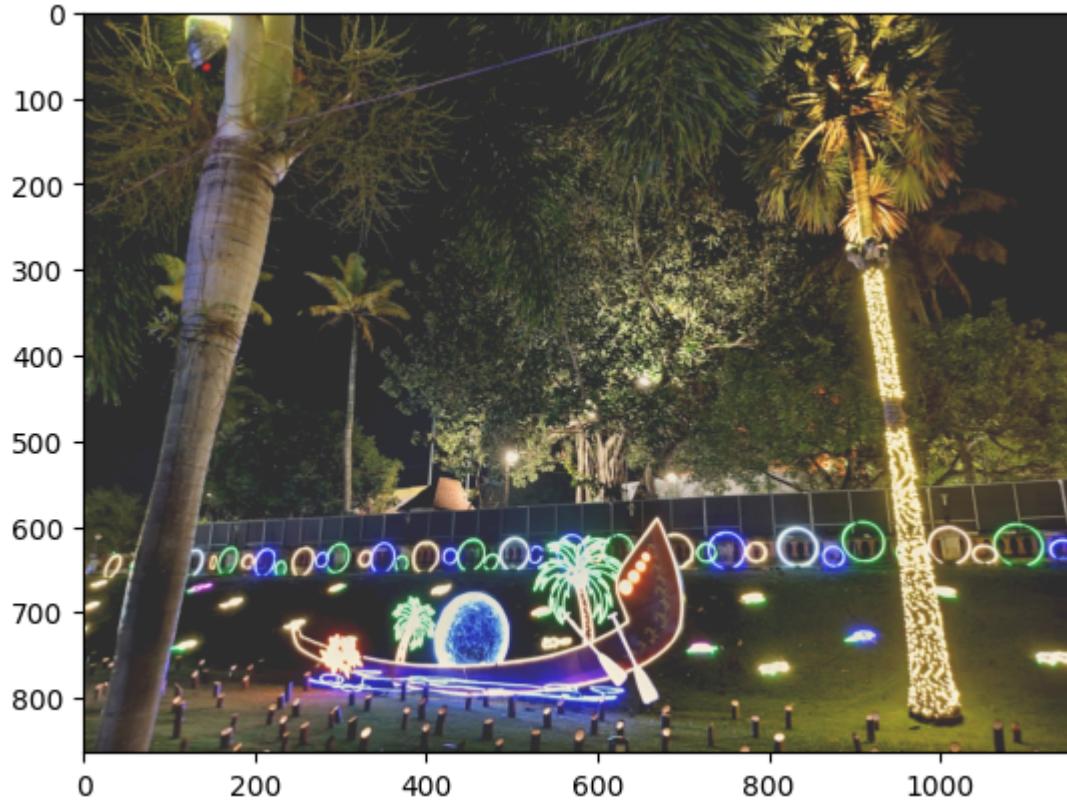
```
In [84]: plt.imshow(img_array[400:800,600:700])
```

```
Out[84]: <matplotlib.image.AxesImage at 0x1f726684140>
```



```
In [99]: import numpy as np  
import matplotlib.pyplot as plt  
v1 = np.where(img_array < 50, 45, img_array * 1)  
plt.imshow(v1)  
plt.show
```

```
Out[99]: <function matplotlib.pyplot.show(close=None, block=None)>
```



In []:

```
C:\Users\hp\myenv>Scripts\activate
'Scripts' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\hp\myenv>Scripts\activate
(myenv) C:\Users\hp\myenv>python
Python 3.12.0 (tags/v3.12.0:0fb18b0, Oct 2 2023, 13:03:39) [MSC v.1935 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> ^Z

(myenv) C:\Users\hp\myenv>pip install freeze
ERROR: Could not find a version that satisfies the requirement freeze (from versions: none)
ERROR: No matching distribution found for freeze

(myenv) C:\Users\hp\myenv>pip install numpy
Collecting numpy
  Using cached numpy-1.26.1-cp312-cp312-win_amd64.whl.metadata (61 kB)
Using cached numpy-1.26.1-cp312-cp312-win_amd64.whl (15.5 MB)
Installing collected packages: numpy
Successfully installed numpy-1.26.1

(myenv) C:\Users\hp\myenv>python
Python 3.12.0 (tags/v3.12.0:0fb18b0, Oct 2 2023, 13:03:39) [MSC v.1935 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print ("hello world")
hello world
>>> jupyter notebook
File "<stdin>", line 1
  jupyter notebook
    ^^^^^^
SyntaxError: invalid syntax
>>>
>>> jupyter notebook
File "<stdin>", line 1
  jupyter notebook
    ^^^^^^
SyntaxError: invalid syntax
>>> print ("hello world")
hello world
>>> jupyter notebook
```

```
C:\Users\hp>mkdir myenv
C:\Users\hp>virtualenv myenv
created virtual environment CPython3.12.0.final.0-64 in 15235ms
  creator CPython3Windows(dest=C:\Users\hp\myenv, clear=False, no_vcs_ignore=False, global=False)
  seeder FromAppData(download=False, pip=bundle, via=copy, app_data_dir=C:\Users\hp\AppData\Local\pypa\virtualenv)
    added seed packages: pip==23.3.1
activators BashActivator,BatchActivator,FishActivator,NushellActivator,PowerShellActivator,PythonActivator

C:\Users\hp>venv myenv
'venv' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\hp>_m venv myenv
'_m' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\hp>python -m venv myenv

C:\Users\hp>cd myenv
C:\Users\hp\myenv>dir
 Volume in drive C has no label.
 Volume Serial Number is FA9C-3D43

 Directory of C:\Users\hp\myenv

08-11-2023  14:25    <DIR>          .
08-11-2023  14:25    <DIR>          ..
08-11-2023  14:21            42 .gitignore
08-11-2023  14:25    <DIR>          Include
08-11-2023  14:21    <DIR>          Lib
08-11-2023  14:25            293 pyvenv.cfg
08-11-2023  14:25    <DIR>          Scripts
              2 File(s)        335 bytes
              5 Dir(s)  395,333,992,448 bytes free
```

In []:

In []: 5. Make an html page **and** traverse over the tree iteratively, recursively **and** sideways

In [7]:

```
from bs4 import BeautifulSoup

with open('my-soup.html', 'r') as page:
    soup = BeautifulSoup(page, 'html.parser')
print(soup)
body_tag = soup.body
for child in body_tag.children:
    if child.name:
        print(child.name)
head_tag = soup.head
for child in head_tag.descendants:
    if child.name:
        print(child.name)

title_tag = soup.title
print(title_tag.parent)

sibling = body_tag.c
print(sibling)

if sibling:
    print(sibling.next_sibling)
    print(sibling.previous_sibling)
else:
    print("No 'sibling' tag found")
```

```
<html>
<head>
<title>
    The Dormouse's story
</title>
</head>
<body><b>The Dormouse's story</b><c>Ctag-The Dormouse's story</c><d>Dtag-The Dormous
e's story</d>
<p class="title">
</p>
<p class="story">
    Once upon a time there were three little sisters; and their names were
    <a class="sister" href="http://example.com/elsie" id="link1">
        Elsie
    </a>
    ,
    <a class="sister" href="http://example.com/lacie" id="link2">
        Lacie
    </a>
    and
    <a class="sister" href="http://example.com/tillie" id="link3">
        Tillie
    </a>
    ;
    and they lived at the bottom of a well.
</p>
<p class="story">
    ...
</p>
</body>
</html>
b
c
d
p
p
p
title
<head>
<title>
    The Dormouse's story
</title>
</head>
<c>Ctag-The Dormouse's story</c>
<d>Dtag-The Dormouse's story</d>
<b>The Dormouse's story</b>
```

In []:

In []:

In []: 6. Make a soup object **and** show different methods **for** modifying the contents.

```
In [9]: from bs4 import BeautifulSoup
```

```
html = """
<html>
<head>
    <title>Sample Page</title>
</head>
<body>
    <h1>This is a heading</h1>
    <p>This is a paragraph.</p>
    <ul>
        <li>Item 1</li>
        <li>Item 2</li>
    </ul>
</body>
</html>
"""

soup = BeautifulSoup(html, 'html.parser')

print("Original HTML:")
print(soup.prettify())


h1_tag = soup.find('h1')
h1_tag.string = "New Heading"

print("\nHTML after modifying the text of the <h1> tag:")
print(soup.prettify())


new_p_tag = soup.new_tag("p")
new_p_tag.string = "This is a new paragraph."
body_tag = soup.body
body_tag.append(new_p_tag)

print("\nHTML after adding a new <p> tag:")
print(soup.prettify())


ul_tag = soup.find('ul')
new_ol_tag = soup.new_tag("ol")
ul_tag.replace_with(new_ol_tag)

print("\nHTML after replacing the <ul> tag with an <ol> tag:")
print(soup.prettify())


new_p_tag.extract()

print("\nHTML after deleting the new <p> tag:")
print(soup.prettify())
```

Original HTML:

```
<html>
  <head>
    <title>
      Sample Page
    </title>
  </head>
  <body>
    <h1>
      This is a heading
    </h1>
    <p>
      This is a paragraph.
    </p>
    <ul>
      <li>
        Item 1
      </li>
      <li>
        Item 2
      </li>
    </ul>
  </body>
</html>
```

HTML after modifying the text of the `<h1>` tag:

```
<html>
  <head>
    <title>
      Sample Page
    </title>
  </head>
  <body>
    <h1>
      New Heading
    </h1>
    <p>
      This is a paragraph.
    </p>
    <ul>
      <li>
        Item 1
      </li>
      <li>
        Item 2
      </li>
    </ul>
  </body>
</html>
```

HTML after adding a new `<p>` tag:

```
<html>
  <head>
    <title>
```

```
    Sample Page
</title>
</head>
<body>
<h1>
    New Heading
</h1>
<p>
    This is a paragraph.
</p>
<ul>
    <li>
        Item 1
    </li>
    <li>
        Item 2
    </li>
</ul>
<p>
    This is a new paragraph.
</p>
</body>
</html>
```

HTML after replacing the `` tag with an `` tag:

```
<html>
<head>
    <title>
        Sample Page
    </title>
</head>
<body>
    <h1>
        New Heading
    </h1>
    <p>
        This is a paragraph.
    </p>
    <ol>
    </ol>
    <p>
        This is a new paragraph.
    </p>
</body>
</html>
```

HTML after deleting the new `<p>` tag:

```
<html>
<head>
    <title>
        Sample Page
    </title>
</head>
<body>
```

```
<h1>
  New Heading
</h1>
<p>
  This is a paragraph.
</p>
<ol>
</ol>
</body>
</html>
```

In []:

In []:

In []: 7. Make a soup object and show different methods to remove the contents and tags.

In [8]:

```
from bs4 import BeautifulSoup

html = """
<html>
<head>
  <title>knowledge should be combined with wisdom</title>
</head>
<body>
  <h1>Big Heading</h1>
  <h2>Everything</h2>
  <h3>is</h3>
  <h4>working</h4>
  <h5>for</h5>
  <h6>my</h6>
  <h7>highest</h7>
  <h5>potential</h5>
</body>
</html>
"""

soup = BeautifulSoup(html, 'html.parser')

print("Original HTML:")
print(soup.prettify())

h1_tag = soup.find('h1')
h1_tag.extract()
print("\nHTML after removing the <h1> tag:")
print(soup.prettify())

h5_tags = soup.find_all('h5')
for h5_tag in h5_tags:
    h5_tag.extract()
print("\nHTML after removing all <h5> tags:")
print(soup.prettify())

body_tag = soup.body
```

```
body_tag.clear()

print("\nHTML after removing all contents within the <body> tag:")
print(soup.prettify())
```

Original HTML:

```
<html>
  <head>
    <title>
      knowledge should be combined with wisdom
    </title>
  </head>
  <body>
    <h1>
      Big Heading
    </h1>
    <h2>
      Everything
    </h2>
    <h3>
      is
    </h3>
    <h4>
      working
    </h4>
    <h5>
      for
    </h5>
    <h6>
      my
    </h6>
    <h7>
      highest
    </h7>
    <h5>
      potential
    </h5>
  </body>
</html>
```

HTML after removing the `<h1>` tag:

```
<html>
  <head>
    <title>
      knowledge should be combined with wisdom
    </title>
  </head>
  <body>
    <h2>
      Everything
    </h2>
    <h3>
      is
    </h3>
    <h4>
      working
    </h4>
    <h5>
      for
    </h5>
```

```
<h6>
    my
</h6>
<h7>
    highest
</h7>
<h5>
    potential
</h5>
</body>
</html>
```

HTML after removing all <h5> tags:

```
<html>
<head>
    <title>
        knowledge should be combined with wisdom
    </title>
</head>
<body>
    <h2>
        Everything
    </h2>
    <h3>
        is
    </h3>
    <h4>
        working
    </h4>
    <h6>
        my
    </h6>
    <h7>
        highest
    </h7>
</body>
</html>
```

HTML after removing all contents within the <body> tag:

```
<html>
<head>
    <title>
        knowledge should be combined with wisdom
    </title>
</head>
<body>
</body>
</html>
```

In []:

In []: 8. Write a python program using scipy to read **and** write a wavfile.

In []:

```
import numpy as np
from scipy.io import wavfile

input_wav_file = 'sample-3s.wav'
output_wav_file = 'output.wav'
sample_rate, audio_data = wavfile.read(input_wav_file)

print(f"Sample rate: {sample_rate}")
print(f"Audio data:\n{audio_data}")

duration = 5
frequency = 440
t = np.linspace(0, duration, int(sample_rate * duration), endpoint=False)
sine_wave = 0.5 * np.sin(2 * np.pi * frequency * t)

scaled_wave = np.int16(sine_wave * 32767)

wavfile.write(output_wav_file, sample_rate, scaled_wave)

print("Wrote the sine wave to 'output.wav'")
```

Sample rate: 44100

Audio data:

```
[[ -1934 -1934]
 [-1276 -1276]
 [ -241 -241]
 ...
 [ 438  438]
 [ 593  593]
 [ 88  88]]
```

Wrote the sine wave to 'output.wav'

In []:

9. Write a python program to get iris data **from** sklearn library

In [1]: **from** sklearn.datasets **import** load_iris

In [2]: **iris=load_iris()**

In [3]: **print(iris)**

```
{'data': array([[5.1, 3.5, 1.4, 0.2],  
   [4.9, 3. , 1.4, 0.2],  
   [4.7, 3.2, 1.3, 0.2],  
   [4.6, 3.1, 1.5, 0.2],  
   [5. , 3.6, 1.4, 0.2],  
   [5.4, 3.9, 1.7, 0.4],  
   [4.6, 3.4, 1.4, 0.3],  
   [5. , 3.4, 1.5, 0.2],  
   [4.4, 2.9, 1.4, 0.2],  
   [4.9, 3.1, 1.5, 0.1],  
   [5.4, 3.7, 1.5, 0.2],  
   [4.8, 3.4, 1.6, 0.2],  
   [4.8, 3. , 1.4, 0.1],  
   [4.3, 3. , 1.1, 0.1],  
   [5.8, 4. , 1.2, 0.2],  
   [5.7, 4.4, 1.5, 0.4],  
   [5.4, 3.9, 1.3, 0.4],  
   [5.1, 3.5, 1.4, 0.3],  
   [5.7, 3.8, 1.7, 0.3],  
   [5.1, 3.8, 1.5, 0.3],  
   [5.4, 3.4, 1.7, 0.2],  
   [5.1, 3.7, 1.5, 0.4],  
   [4.6, 3.6, 1. , 0.2],  
   [5.1, 3.3, 1.7, 0.5],  
   [4.8, 3.4, 1.9, 0.2],  
   [5. , 3. , 1.6, 0.2],  
   [5. , 3.4, 1.6, 0.4],  
   [5.2, 3.5, 1.5, 0.2],  
   [5.2, 3.4, 1.4, 0.2],  
   [4.7, 3.2, 1.6, 0.2],  
   [4.8, 3.1, 1.6, 0.2],  
   [5.4, 3.4, 1.5, 0.4],  
   [5.2, 4.1, 1.5, 0.1],  
   [5.5, 4.2, 1.4, 0.2],  
   [4.9, 3.1, 1.5, 0.2],  
   [5. , 3.2, 1.2, 0.2],  
   [5.5, 3.5, 1.3, 0.2],  
   [4.9, 3.6, 1.4, 0.1],  
   [4.4, 3. , 1.3, 0.2],  
   [5.1, 3.4, 1.5, 0.2],  
   [5. , 3.5, 1.3, 0.3],  
   [4.5, 2.3, 1.3, 0.3],  
   [4.4, 3.2, 1.3, 0.2],  
   [5. , 3.5, 1.6, 0.6],  
   [5.1, 3.8, 1.9, 0.4],  
   [4.8, 3. , 1.4, 0.3],  
   [5.1, 3.8, 1.6, 0.2],  
   [4.6, 3.2, 1.4, 0.2],  
   [5.3, 3.7, 1.5, 0.2],  
   [5. , 3.3, 1.4, 0.2],  
   [7. , 3.2, 4.7, 1.4],  
   [6.4, 3.2, 4.5, 1.5],  
   [6.9, 3.1, 4.9, 1.5],  
   [5.5, 2.3, 4. , 1.3],  
   [6.5, 2.8, 4.6, 1.5],  
   [5.7, 2.8, 4.5, 1.3],
```

[6.3, 3.3, 4.7, 1.6],
[4.9, 2.4, 3.3, 1.],
[6.6, 2.9, 4.6, 1.3],
[5.2, 2.7, 3.9, 1.4],
[5. , 2. , 3.5, 1.],
[5.9, 3. , 4.2, 1.5],
[6. , 2.2, 4. , 1.],
[6.1, 2.9, 4.7, 1.4],
[5.6, 2.9, 3.6, 1.3],
[6.7, 3.1, 4.4, 1.4],
[5.6, 3. , 4.5, 1.5],
[5.8, 2.7, 4.1, 1.],
[6.2, 2.2, 4.5, 1.5],
[5.6, 2.5, 3.9, 1.1],
[5.9, 3.2, 4.8, 1.8],
[6.1, 2.8, 4. , 1.3],
[6.3, 2.5, 4.9, 1.5],
[6.1, 2.8, 4.7, 1.2],
[6.4, 2.9, 4.3, 1.3],
[6.6, 3. , 4.4, 1.4],
[6.8, 2.8, 4.8, 1.4],
[6.7, 3. , 5. , 1.7],
[6. , 2.9, 4.5, 1.5],
[5.7, 2.6, 3.5, 1.],
[5.5, 2.4, 3.8, 1.1],
[5.5, 2.4, 3.7, 1.],
[5.8, 2.7, 3.9, 1.2],
[6. , 2.7, 5.1, 1.6],
[5.4, 3. , 4.5, 1.5],
[6. , 3.4, 4.5, 1.6],
[6.7, 3.1, 4.7, 1.5],
[6.3, 2.3, 4.4, 1.3],
[5.6, 3. , 4.1, 1.3],
[5.5, 2.5, 4. , 1.3],
[5.5, 2.6, 4.4, 1.2],
[6.1, 3. , 4.6, 1.4],
[5.8, 2.6, 4. , 1.2],
[5. , 2.3, 3.3, 1.],
[5.6, 2.7, 4.2, 1.3],
[5.7, 3. , 4.2, 1.2],
[5.7, 2.9, 4.2, 1.3],
[6.2, 2.9, 4.3, 1.3],
[5.1, 2.5, 3. , 1.1],
[5.7, 2.8, 4.1, 1.3],
[6.3, 3.3, 6. , 2.5],
[5.8, 2.7, 5.1, 1.9],
[7.1, 3. , 5.9, 2.1],
[6.3, 2.9, 5.6, 1.8],
[6.5, 3. , 5.8, 2.2],
[7.6, 3. , 6.6, 2.1],
[4.9, 2.5, 4.5, 1.7],
[7.3, 2.9, 6.3, 1.8],
[6.7, 2.5, 5.8, 1.8],
[7.2, 3.6, 6.1, 2.5],
[6.5, 3.2, 5.1, 2.],
[6.4, 2.7, 5.3, 1.9],


```
 1 length:  1.0  6.9   3.76   1.76    0.9490  (high!)\n      petal width:    0.1  2.5\n 1.20   0.76   0.9565  (high!)\n      =====\n      :Missing Attribute Values: None\n      :Class Distribution: 33.3% f\nor each of 3 classes.\n      :Creator: R.A. Fisher\n      :Donor: Michael Marshall (MARS\nHALL%PLU@io.arc.nasa.gov)\n      :Date: July, 1988\nThe famous Iris database, first\nused by Sir R.A. Fisher. The dataset is taken\nfrom Fisher's paper. Note that it's\nthe same as in R, but not as in the UCI\nMachine Learning Repository, which has two\nwrong data points.\nThis is perhaps the best known database to be found in the\npattern recognition literature. Fisher's paper is a classic in the field and\nis referenced frequently to this day. (See Duda & Hart, for example.) The\ndata set contains 3 classes of 50 instances each, where each class refers to a\n"type" of iris plant. One class is linearly separable from the other 2; the\nlatter are NOT linearly separable from each other.\n|details-start|\n**References**\n|details-split|\nFisher, R.A. "The use of multiple measurements in taxonomic problems"\nAnnual Eugenics, 7, Part II, 179-188 (1936); also in "Contributions to\nMathematical Statistics" (John Wiley, NY, 1950).\nDuda, R.O., & Hart, P.E. (1973) Pattern Classification and Scene Analysis.\n(Q327.D83) John Wiley & Sons. ISBN 0-471-22361-1. See page 218.\nDasarathy, B.V. (1980) "Nosing Around the Neighborhood: A New System\nStructure and Classification Rule for Recognition in Partially Exposed\nEnvironments". IEEE Transactions on Pattern Analysis and Machine\nIntelligence, Vol. PAMI-2, No. 1, 67-71.\nGates, G.W. (1972) "The Reduced Nearest Neighbor Rule". IEEE Transactions\non Information Theory, May 1972, 431-433.\nSee also: 1988 MLC Proceedings,\n54-64. Cheeseman et al's AUTOCLASS II\nconceptual clustering system finds 3 classes in the data.\nMany, many more ...\n|details-end|', 'feature_names': ['sepal length (cm)', 'sepal width (cm)', 'petal length (cm)', 'petal width (cm)'], 'filename': 'iris.csv', 'data_module': 'sklearn.datasets.data'}
```

```
In [5]: from scipy.io import wavfile
```

```
In [6]: samplerate,data=wavfile.read('sample-3s.wav')
```

```
In [7]: print(samplerate)
```

```
44100
```

```
In [8]: print(data)
```

```
[[ -1934 -1934]\n[ -1276 -1276]\n[ -241 -241]\n...\n[  438   438]\n[  593   593]\n[   88    88]]
```

```
In [10]: import numpy as np
```

```
In [11]: wavfile.write("example.wav",samplerate,data.astype(np.int16))
```

```
In [ ]:
```

```
In [ ]: 4. Write a python program to read a url and do the following:  
● Get the title of the webpage.  
● Get the body of the webpage and create a text file with it.  
● Get all the urls that the web page refers to.
```

```
In [ ]:
```

```
In [ ]:
```

```
In [2]: pip install bs4
```

```
Requirement already satisfied: bs4 in c:\users\hp\appdata\local\programs\python\python312\lib\site-packages (0.0.1)  
Requirement already satisfied: beautifulsoup4 in c:\users\hp\appdata\local\programs\python\python312\lib\site-packages (from bs4) (4.12.2)  
Requirement already satisfied: soupsieve>1.2 in c:\users\hp\appdata\local\programs\python\python312\lib\site-packages (from beautifulsoup4->bs4) (2.5)  
Note: you may need to restart the kernel to use updated packages.
```

```
In [4]: from bs4 import BeautifulSoup  
page=open('my-soup.html','r')  
soup=BeautifulSoup(page,"html.parser")  
print(soup)
```

```
<html>
<head>
<title>
    The Dormouse's story
</title>
</head>
<body><b>The Dormouse's story</b><c>Ctag-The Dormouse's story</c><d>Dtag-The Dormous
e's story</d>
<p class="title">
</p>
<p class="story">
    Once upon a time there were three little sisters; and their names were
    <a class="sister" href="http://example.com/elsie" id="link1">
        Elsie
    </a>
    ,
    <a class="sister" href="http://example.com/lacie" id="link2">
        Lacie
    </a>
    and
    <a class="sister" href="http://example.com/tillie" id="link3">
        Tillie
    </a>
    ;
    and they lived at the bottom of a well.
</p>
<p class="story">
    ...
</p>
</body>
</html>
```

```
In [5]: print(soup.name)
```

```
[document]
```

```
In [42]: head_tag=soup.head
```

```
In [9]: print(head_tag.name)
```

```
head
```

```
In [ ]: #• Get the title of the webpage.
```

```
In [10]: print(head_tag.contents)
```

```
['\n', <title>
    The Dormouse's story
</title>, '\n']
```

```
In [11]: body_tag=soup.body
```

```
In [ ]:
```

```
In [12]: print(body_tag.contents)
```

```
[<b>The Dormouse's story</b>, <c>Ctag-The Dormouse's story</c>, <d>Dtag-The Dormous  
e's story</d>, '\n', <p class="title">  
</p>, '\n', <p class="story">  
    Once upon a time there were three little sisters; and their names were  
    <a class="sister" href="http://example.com/elsie" id="link1">  
        Elsie  
    </a>  
,  
    <a class="sister" href="http://example.com/lacie" id="link2">  
        Lacie  
    </a>  
    and  
    <a class="sister" href="http://example.com/tillie" id="link3">  
        Tillie  
    </a>  
;  
    and they lived at the bottom of a well.  
    </p>, '\n', <p class="story">  
    ...  
    </p>, '\n']
```

```
In [13]: title_tag=soup.title
```

```
In [ ]:
```

```
In [16]: b_tag=soup.b
```

```
In [17]: print(b_tag)
```

```
<b>The Dormouse's story</b>
```

```
In [21]: b_tag=soup.b  
print(b_tag.contents)
```

```
["The Dormouse's story"]
```

```
In [22]: b_tag.insert(1,"Hello Brother")
```

```
In [23]: print(b_tag.contents)
```

```
["The Dormouse's story", 'Hello Brother']
```

```
In [25]: import requests  
from bs4 import BeautifulSoup
```

```
In [26]: url="https://www.google.com/"
```

```
In [27]: page=requests.get(url)
```

```
In [30]: soup=BeautifulSoup(page.content,"html.parser")
```

```
In [31]: print(soup)
```

```
<!DOCTYPE html>
<html itemscope="" itemtype="http://schema.org/WebPage" lang="en-IN"><head><meta content="text/html; charset=utf-8" http-equiv="Content-Type"/><meta content="/images/branding/googleg/1x/googleg_standard_color_128dp.png" itemprop="image"/><title>Google
</title><script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var _g={kEI:'RGBLZcSRJvem
ptQP2LCBuAQ',kEXPI:'0,1365468,206,4804,2316,383,246,5,1129120,1912,1195785,704,38008
9,16115,28684,22430,1362,12320,2814,14765,4998,17075,38444,2872,2891,4140,4209,3405,
606,30668,30022,16335,1014,1,16916,2652,4,32894,26723,4437,22616,6621,7596,1,42154,
2,16737,23024,5679,1020,31122,4569,6255,23421,1249,33067,2,2,1,10956,15676,8155,2335
0,874,19633,7,1922,9779,42459,20198,20137,14,82,13333,6873,8377,18960,5403,781,2249,
11151,4665,357,1447,7734,19359,8175,12290,952,87,117,8843,868,4733,3692,16480,5769,1
5977,5210139,2,505,2,205,355,5993898,253,2802961,3311,141,795,29805,23940763,578,273
7885,1305643,16672,40904,2983,3,1558,5,542,3,3066,1390876,23759270,7950,1,212,3416,4
165,2755,2709,2091,787,335,1260,3554,2727,3944,1377,4836,12386,818,874,2,3,6580,120
7,5,1905,2033,1966,1875,2,2,3538,11068,1629,5745,946,97,2082,1,2064,2971,1232,3615,
3,178,2714,2,1925,2,3,1652,36,2052,27,6,5,15,313,1064,3,1047,2670,699,4,872,1866,2,1
4,906,4,77,87,2382,353,2358,241,1263,938,304,415,333,11,5,2238,48,1423,3,411,829,63,
3,1192,990,44,2,3,1113,1121,526,20,3,412,1281,11,124,737,268,3,481,400,17,97,401,165
3,572,1,961,153,50,943,4,1070,661,222,85,93,74,189,938,621,256,1,6,2588,268,529,32,2
24,7,4,227,269,346,4,186,313,13,162,878,12,285,462,11,130,590,405,26,4,21,648,503,11
7,439,3,291,151,175,106,241,62,586,94,1104,496,115,451,57,63,719,30,3,136,6,1001,43,
65,1,3,4,2,2,2,344,65,7,1,8,122,195,46,29,1932,364,1727,5,453,68,1013,3,624,147,2,58
2,3,399,126,192,4,12,1,48,205,492,136,228,219,648,182,21778223,467',kBL:'SA7v',kOPI:
89978449};(function(){var a;(null==(a=window.google)?0:a.stvsc)?google.kEI=_g.kEI:wi
ndow.google=_g;}).call(this);});(function(){google.sn='webhp';google.kHL='en-I
N';});(function(){
var h=this||self;function l(){return void 0!==window.google&&void 0!==window.google.
kOPI&&0!==window.google.kOPI?window.google.kOPI:null};var m,n=[];function p(a){for(v
ar b;a&&(!a.getAttribute||!(b=a.getAttribute("eid"))));)a=a.parentNode;return b||m}fu
nction q(a){for(var b=null;a&&(!a.getAttribute||!(b=a.getAttribute("leid"))));a=a.pa
rentNode;return b}function r(a){/^http:/i.test(a)&&"https":==window.location.protoc
ol&&(google.ml&&google.ml(Error("a")),!1,{src:a,glmm:1}),a="");return a}
function t(a,b,c,d,k){var e="";-1==b.search("&ei")&&(e+"&ei="+p(d),-1==b.search
("&lei")&&(d=q(d))&&(e+="&lei="+d));d="";var g=-1==b.search("&cshid")&&"slh"!=a,
f=[];f.push(["zx",Date.now().toString()]);h._cshid&&g&&f.push(["cshid",h._cshid]);c=
c();null!=c&&f.push(["opi",c.toString()]);for(c=0;c<f.length;c++){if(0==c||0<c)d+
="&;d+=f[c][0]+"+f[c][1]}return"/+(k||"gen_204")+"?atyp=i&ct="+String(a)+"&cad
="+(b+e+d);m=google.kEI;google.getEI=p;google.getLEI=q;google.ml=function(){return
null};google.log=function(a,b,c,d,k,e){e:void 0==e?l:e;c||(c=t(a,b,e,d,k));if(c=r
(c)){a=new Image;var g=n.length;n[g]=a;a.onerror=a.onload=a.onabort=function(){delet
e n[g]};a.src=c}};google.logUrl=function(a,b){b:void 0==b?l:b;return t("",a,b)};).
call(this);(function(){google.y={};google.sy=[];google.x=function(a,b){if(a)var c=a.
id;else{do c=Math.random();while(google.y[c])google.y[c]=[a,b];return!1};google.sx=
function(a){google.sy.push(a)};google.lm=[];google.plm=function(a){google.lm.push.ap
ply(google.lm,a)};google.lq=[];google.load=function(a,b,c){google.lq.push([a],b,
c)};google.loadAll=function(a,b){google.lq.push([a,b])};google.bx=!1;google.lx=func
tion(){};var d=[];google.fce=function(a,b,c,e){d.push([a,b,c,e])};google.qce=d;}).ca
ll(this);google.f={};(function(){
document.documentElement.addEventListener("submit",function(b){var a;if(a=b.target)
{var c=a.getAttribute("data-submitfalse");a="1"==c||"q"==c&&!a.elements.q.value?!
0:!1}else a=!1;a&&(b.preventDefault(),b.stopPropagation()),!0);document.documentElement.
addEventListener("click",function(b){var a;a:{for(a=b.target;a&&a!=document.d
ocumentElement;a=a.parentElement)if("A"==a.tagName){a="1"==a.getAttribute("data-noh
ref");break}a=a!=1)a&&b.preventDefault(),!0});}.call(this);</script><style>#gbar,#g
user{font-size:13px;padding-top:1px !important;}#gbar{height:22px}#guser{padding-bot
tom:7px !important;text-align:right}.gbh,.gbd{border-top:1px solid #c9d7f1;font-siz
```


e.com/&ec=GAZAAQ" id="gb_70" target="_top">Sign in</nobr></div><div class="gbh" style="left:0"></div><div class="gbh" style="right:0"></div></div><center><br clear="all" id="lgpd"/><div id="lga">

</div><form action="/search" name="f"><table cellpadding="0" cellspacing="0"><tr valign="top"><td width="25%"> </td><td align="center" nowrap=""><input name="ie" type="hidden" value="ISO-8859-1"/><input name="hl" type="hidden" value="en-IN"/><input name="source" type="hidden" value="hp"/><input name="biw" type="hidden"/><input name="bih" type="hidden"/><div class="ds" style="height:32px; margin:4px 0"><input autocomplete="off" class="lst" maxlength="2048" name="q" size="57" style="margin:0; padding:5px 8px 0 6px; vertical-align:top; color:#000" title="Google Search" value="" /></div><br style="line-height:0"/><input class="lsb" name="btnG" type="submit" value="Google Search"/><input class="lsb" id="tsuid_1" name="btnI" type="submit" value="I'm Feeling Lucky"/><script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var id='tsuid_1';document.getElementById(id).onclick = function(){if (this.form.q.value){this.checked = 1;if (this.form.iflsig) this.form.iflsig.disabled = false;}else top.location='/doodles/'}});</script><input name="iflsig" type="hidden" value="A06bg0gAAAAAZUtuvBVwRxDgMuOK96YbDSSHFVN-XQD3"/></td><td align="left" class="fl sbLC" nowrap="" width="25%">Advanced search</td></tr></table><input id="gbv" name="gbv" type="hidden" value="1"/><script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var a,b="1";if(document&&document.getElementById)if("undefined"!=typeof XMLHttpRequest)b="2";else if("undefined"!=typeof ActiveXObject){var c,d,e=["MSXML2.XMLHTTP.6.0","MSXML2.XMLHTTP.3.0","MSXML2.XMLHTTP","Microsoft.XMLHTTP"];for(c=0;d=e[c++];)try{new ActiveXObject(d),b="2"}catch(h){}a=b;if("2"==a&&-1==location.search.indexOf("&gbv=2")){var f=google.gbvu,g=document.getElementById("gbv");g&&(g.value=a);f&&window.setTimeout(function(){location.href=f},0)};}.call(this);</script></form><div id="gac_scont"></div><div style="font-size:83%; min-height:3.5em">
<div id="gws-output-pages-elements-homepage_additional_languages_als"><style>#gws-output-pages-elements-homepage_additional_languages_als{font-size:small; margin-bottom:24px}#SIVCob{color:#3c4043; display:inline-block; line-height:28px; }#SIVCob a{padding:0 3px;}.H6sW5{display:inline-block; margin:0 2px; white-space: nowrap}.z4hgWe{display:inline-block; margin:0 2px}</style><div id="SIVCob">Google offered in:हिन्दी বাংলা తెలుగు मराठी தமிழ் ગુજરાતી ಕನ್ನಡ ଓଡ଼ିଆ ਪੰਜਾਬੀ </div></div><div style="font-size:10pt"><div id="WqQANb" style="margin:19px auto; text-align:center">AdvertisingBusiness</div></div>

SolutionsAbout GoogleGoogle.co.in</div></div><p style="font-size:8pt;color:#70757a">© 2023 - Privacy - Terms</p></center><script nonce="VTSap2-usiUhKr58VhEGLg">(function(){window.google.cdo={height:757,width:1440};(function(){var a=window.innerWidth,b=window.innerHeight;if(!a||!b){var c=window.document,d="CSS1Compat"==c.compatMode?c.documentElement:c.body;a=d.clientWidth;b=d.clientHeight}if(a&&b&&(a!=google.cdo.width||b!=google.cdo.height)){var e=google,f=e.log,g="/client_204?&atyp=i&biw="+a+"&bih="+b+"&ei="+google.kEI,h="",k=[],l=void 0!=window.google&&void 0!=window.google.kOPI&&0!=window.google.kOPI?window.google.kOPI:null;null!=l&&k.push(["opi",l.toString()]);for(var m=0;m<k.length;m++){if(0==m||0<m)h+="&;h+=k[m][0]+"+k[m][1]}f.call(e,"","",g+h)}).call(this);})()</script> <script nonce="VTSap2-usiUhKr58VhEGLg">(function(){google.xjs={ck:'xjs.hp.OZLy0DasWiU.L.X.O',combam:'CAAAAAAAAAAAAAAAIAACIBsIhAAAAQCAABAAAgaAACFghCiEYACAAAIAIFSAAGAUIQgAAEBUAZgEAICAGAAAAAAACEfQIAAAAIAADAAAAABDQKYIAQqAgIAAAAIAcAgAeAGARYAAAAAAAAABCwBMHgggQAQAAAAAAAAAAAAAAAClp4g',cs:'ACT90oE6r2YZF3Pq_064nz6unMrMawV65A',cssam:'AAAAAAAAAAAAAAACl',cssopt:false,cssss:'ACT90oGKtwWpdOHU8ymNjzPDrKxx_65Z-A',excm:[],sepam:false,sepccs:s:false}}();</script> <script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var u='/xjs/_/js/k\x3dxjs.hp.en._jFN1-BybTE.O/am\x3dAAAAAAAEEAAAAAAHAAgQAAAAAAEAEBHAAAsAMAF/d\x3d1/ed\x3d1/rs\x3dACT90oFU2KPMNsYRIOCabrkKAXg498BJQ/m\x3dsb_he,d,cEt90b,SNUn3,qddgKe,sTsDMc,dt10hd,eHdf1';var amd=0;var e=this||self,f=function(a){return a};var g;var h=function(a){this.g=a};h.prototype.toString=function(){return this.g+""};var k={};var l=function(){var a=document;var b="SCRIPT";"application/xhtml+xml"==a.contentType&&(b=b.toLowerCase());return a.createElement(b)};function m(a,b){a.src=b instanceof h&&b.constructor==h?b.g:"type_error:TrustedResourceUrl";var c,d;(c=(b=null==(d=(c=(a.ownerDocument&&a.ownerDocument.defaultView||window).document).querySelector)?void 0:d.call(c,"script[nonce]"))?b.nonce||b.getAttribute("nonce")||""":"")&&a.setAttribute("nonce",c);function n(a){a=null==a?"null":void 0==a?"undefined":a;if(void 0==g){var b=null;var c=e.trustedTypes;if(c&&c.createPolicy){try{b=c.createPolicy("goog#html",{createHTML:f,createScript:f,createScriptURL:f})}catch(d){e.console&&e.console.error(d.message)}g=b}else g=b}a=(b=g)?b.createScriptURL(a):a;return new h(a,k)};void 0==google.ps&&(google.ps=[]);function p(){var a=u,b=function(){};google.lx=google.stvsc?b:function(){q(a);google.lx=b};google.bx||google.lx();function r(a,b){b&&m(a,n(b));var c=a.onload;a.onload=function(d){c&&(d);google.ps=google.ps.filter(function(t){return a!==t});google.ps.push(a);document.body.appendChild(a)}google.as=r;function q(a){google.timers&&google.timers.load&&google.tick&&google.tick("load","xjsls");var b=l();b.onerror=function(){google.ple=1};b.onload=function(){google.ple=0};google.xjsus=void 0;r(b,a);google.aple=-1;google.psa=!0};google.xjsu=u;e._F_jsUrl=u;setTimeout(function(){0<amd?google.caft(function(){return p()},amd):p()},0)}();window._=window._||{};window._DumpException=_._DumpException=function(e){throw e};window._s=window._s||{};s._DumpException=_._DumpException;window._qs=window._qs||{};qs._DumpException=_._DumpException;(function(){var t=[1,0,0,0,262144,32768,8388720,33554436,524288,4096,1140,24117259];window._F_toggles=window._xjs_toggles=t})();function _F_installCss(c){}(function(){google.jl={blt:'none',chnk:0,dw:false,dwu:true,emtn:0,end:0,ico:false,ikb:0,ine:false,injs:'none',injt:0,injth:0,injv2:false,lls:'default',pdt:0,rep:0,snet:true,strt:0,ubm:false,uwp:true};})(function(){var pmc='{\x22d\x22:{},\x22sb_he\x22:{\x22agen\x22:false,\x22cgen\x22:false,\x22client\x22:\x22heirloom-hp\x22,\x22dh\x22:true,\x22ds\x22:\x22\x22\x22,\x22f1\x22:true,\x22host\x22:\x22google.com\x22,\x22jsonp\x22:true,\x22msgs\x22:{\x22cibl\x22:\x22Clear Search\x22,\x22dym\x22:\x22Did you mean:\x22,\x22lcky\x22:\x22I\u0026#39;m Feeling Lucky\x22,\x22ml\x22:\x22Learn more\x22,\x22psrc\x22:\x22This search was removed from your \u003Ca href\x3d\\\x22hist

```
ory\\x22\\u003EWeb History\\u003C/a\\u003E\\x22,\\x22psr1\\x22:\\x22Remove\\x22,\\x22sbit\\x22:\\x22Search by image\\x22,\\x22srch\\x22:\\x22Google Search\\x22},\\x22ovr\\x22:{},\\x22pq\\x22:\\x22\\x22,\\x22rfs\\x22:[],\\x22sbas\\x22:\\x220 3px 8px 0 rgba(0,0,0,0.2),0 0 0 1px rgba(0,0,0,0.08)\\x22,\\x22stok\\x22:\\x22vp-RAfxyJ47_jNqFCb16Up3TlcU\\x22}';google.pmc=JSON.parse(pm);})(function(){var b=function(a){var c=0;return function(){return c<a.length?{done:!1,value:a[c++]}:{done:!0}}};var e=this||self;var g,h;a:{for(var k=["CLOSURE_FLAGS"],l=e,n=0;n<k.length;n++)if(l[l[k[n]]],null==l){h=null;break}a}h=l}var p=h&&h[610401301];g=null!=p?p:!1;var q,r=e.navigator;q=r?r.userAgentData||null:null;function t(a){return g?q?q.q.brands.some(function(c){return(c=c.brand)&&-1!=c.indexOf(a))}:!1:!1}function u(a){var c;a:{if(c=e.navigator)if(c=c.userAgent)break;a;c=""}return-1!=c.indexOf(a)}function v(){return g?!q&&0<q.brands.length:!1}function w(){return u("Safari")&&!(x()||(v())?0:u("Coast"))||(v())?0:u("Opera"))||(v())?0:u("Edge"))||(v())?t("Microsoft Edge"):u("Edg/")||(v())?t("Opera"):u("OPR"))||u("Firefox")||u("FxiOS")||u("Silk")||u("Android"))}function x(){return v()?t("Chromium"):(u("Chrome")||u("CriOS"))&&!(v())?0:u("Edge"))||u("Silk")}function y(){return u("Android")&&!(x())||u("Firefox")||u("FxiOS")||(v())?0:u("Opera"))||u("Silk"))};var z=v()?1:u("Trident")||u("MSIE");y();x();w();Object.freeze({});var A=!z&&!w(),D=function(a){if(/-/a-z/.test("ved"))return null;if(A&&a.dataset){if(y()&&!("ved" in a.dataset))return null;a=a.dataset.ved;return void 0==a?null:a}return a.getAttribute("data-""+ved".replace(/([A-Z])/g,"-$1").toLowerCase());var E=[],F=null;function G(a){a=a.target;var c=performance.now(),f=[],H=f.concat,d=E;if(!(d instanceof Array)){var m="undefined"!=typeof Symbol&&Symbol.iterator&&d[Symbol.iterator];if(m)d=m.call(d);else if("number"==typeof d.length)d={next:b(d)};else throw Error("a`"+String(d));for(var B=[];!(m=d.next()).done;)B.push(m.value);d=B}E=H.concat(f,d,[c]);if(a&&a instanceof HTMLElement)if(a==F){if(c=4<=E.length)c=5>(E[E.length-1]-E[E.length-4])/1E3;if(c){c=google.getEI(a);a.hasAttribute("data-ved")?f=a?D(a)|""":"";f=(f=a.closest("[data-ved]"))?D(f)||"";f=f||"";if(a.hasAttribute("jsname"))a=a.getAttribute("jsname");else{var C;a=null==(C=a.closest("[jsname]"))?void 0:C.getAttribute("jsname")}google.log("rcm","&ei="+c+"&ved="+f+"&jsname='"+(a||""))}}else F=a,E=[c]window.document.addEventListener("DOMContentLoaded",function(){document.body.addEventListener("click",G)}).call(this);</script></body></html>
```

In [41]: `soup.find_all("a")`

```
Out[41]: [<a class="gb1" href="https://www.google.com/imghp?hl=en&tab=wi">Images</a>,
<a class="gb1" href="https://maps.google.co.in/maps?hl=en&tab=w1">Maps</a>,
<a class="gb1" href="https://play.google.com/?hl=en&tab=w8">Play</a>,
<a class="gb1" href="https://www.youtube.com/?tab=w1">YouTube</a>,
<a class="gb1" href="https://news.google.com/?tab=wn">News</a>,
<a class="gb1" href="https://mail.google.com/mail/?tab=wm">Gmail</a>,
<a class="gb1" href="https://drive.google.com/?tab=wo">Drive</a>,
<a class="gb1" href="https://www.google.co.in/intl/en/about/products?tab=wh" style="text-decoration:none"><u>More</u> </u></a>,
<a class="gb4" href="http://www.google.co.in/history/optout?hl=en">Web History</a>,
<a class="gb4" href="/preferences?hl=en">Settings</a>,
<a class="gb4" href="https://accounts.google.com/ServiceLogin?hl=en&passive=true&continue=https://www.google.com/&ec=GAZAAQ" id="gb_70" target="_top">Sign in</a>,
<a href="/advanced_search?hl=en-IN&authuser=0">Advanced search</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=hi&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAU">ହିନ୍ଦୀ</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=bn&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAY">ବାଂଲା</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=te&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAc">ଓଡ଼ିଆ</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=mr&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAg">ମରାଠୀ</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=ta&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAk">தமிழ்</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=gu&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAo">ગુજરાતી</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=kn&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAs">କଞ୍ଚୁଡ଼େ</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=ml&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCAw">ଓପାନ୍ଧାଳୋ</a>,
<a href="https://www.google.com/setprefs?sig=0_jC9Zazci4HY0dFOCERM22YlQeaE%3D&amp;hl=pa&source=homepage&sa=X&ved=0ahUKEwjEw7ytlrSCAxV3k4kEHVhYAEcQ2ZgBCA0">ਪੰਜਾਬੀ</a>,
<a href="/intl/en/ads/">Advertising</a>,
<a href="http://www.google.co.in/services/">Business Solutions</a>,
<a href="/intl/en/about.html">About Google</a>,
<a href="https://www.google.com/setprefdomain?prefdom=IN&prev=https://www.google.co.in/&sig=K_QaIX1yKJ3k9ZI1Ee0108buc5KpU%3D">Google.co.in</a>,
<a href="/intl/en/policies/privacy/">Privacy</a>,
<a href="/intl/en/policies/terms/">Terms</a>]
```

```
In [33]: body_tag=soup.body
```

```
In [36]: print(soup.body.contents)
```

```
[<script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var src='/images/nav_logo229.png';var iesg=false;document.body.onload = function(){window.n && window.n();if (document.images){new Image().src=src;}  
if (!iesg){document.f&&document.f.q.focus();document.gbqf&&document.gbqf.q.focus();}  
})());</script>, <div id="mngb"><div id="gbar"><nobr><b class="gb1">Search</b> <a class="gb1" href="https://www.google.com/imghp?hl=en&tab=wi">Images</a> <a class="gb1" href="https://maps.google.co.in/maps?hl=en&tab=w1">Maps</a> <a class="gb1" href="https://play.google.com/?hl=en&tab=w8">Play</a> <a class="gb1" href="https://www.youtube.com/?tab=w1">YouTube</a> <a class="gb1" href="https://news.google.com/?tab=wn">News</a> <a class="gb1" href="https://mail.google.com/mail/?tab=wm">Gmail</a> <a class="gb1" href="https://drive.google.com/?tab=wo">Drive</a> <a class="gb1" href="https://www.google.co.in/intl/en/about/products?tab=wh" style="text-decoration:none"><u>More</u> </a></nobr></div><div id="guser" width="100%"><nobr><span class="gb1" id="gbn"></span><span class="gbf" id="gbf"></span><span id="gbe"></span><a class="gb4" href="http://www.google.co.in/history/optout?hl=en">Web History</a> | <a class="gb4" href="/preferences?hl=en">Settings</a> | <a class="gb4" href="https://accounts.google.com/ServiceLogin?hl=en&passive=true&continue=https://www.google.com/&ec=GAZAAQ" id="gb_70" target="_top">Sign in</a></nobr></div><div class="gbh" style="left:0"></div><div class="gbh" style="right:0"></div></div>, <center><br clear="all" id="lgpd"/><div id="lga"><br /><br /></div><form action="/search" name="f"><table cellpadding="0" cellspacing="0"><tr valign="top"><td width="25%"> </td><td align="center" nowrap=""><input name="ie" type="hidden" value="ISO-8859-1"/><input name="hl" type="hidden" value="en-IN"/><input name="source" type="hidden" value="hp"/><input name="biw" type="hidden"/><input name="bih" type="hidden"/><div class="ds" style="height:32px; margin:4px 0"><input autocomplete="off" class="lst" maxlength="2048" name="q" size="57" style="margin:0; padding:5px 8px 0 6px; vertical-align:top; color:#000" title="Google Search" value="" /></div><br style="line-height:0"/><span class="ds"><span class="lsbb"><input class="lsb" name="btnG" type="submit" value="Google Search"/></span><span class="ds"><span class="lsbb"><input class="lsb" id="tsuid_1" name="btnI" type="submit" value="I'm Feeling Lucky"/><script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var id='tsuid_1';document.getElementById(id).onclick = function(){if (this.form.q.value){this.checked = 1;if (this.form.iflsig)this.form.iflsig.disabled = false;}  
else top.location='/doodles/'}})();</script><input name="iflsig" type="hidden" value="A06bg0gAAAAAZUtuvBVwRxDgMuOK96YbDSSHFVN-XQD3"/></span></span></td><td align="left" class="fl sb1c" nowrap="" width="25%"><a href="/advanced_search?hl=en-IN&auth user=0">Advanced search</a></td></tr></table><input id="gbv" name="gbv" type="hidden" value="1"/><script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var a,b="1";if(document&&document.getElementById)if("undefined"!=typeof XMLHttpRequest)b="2";else if("undefined"!=typeof ActiveXObject){var c,d,e=["MSXML2.XMLHTTP.6.0","MSXML2.XMLHTTP.3.0","MSXML2.XMLHTTP","Microsoft.XMLHTTP"];for(c=0;d=e[c++];)try{new ActiveXObject(d),b="2"}catch(h){}a=b;if("2"==a&&-1==location.search.indexOf("&gbv=2")){var f=google.gbv,g=document.getElementById("gbv");g&&(g.value=a);f&&window.setTimeout(function(){location.href=f},0)}).call(this);</script></form><div id="gac_scont"></div><div style="font-size:83%;min-height:3.5em"><br /><div id="gws-output-pages-elements-homepage_additional_languages_als"><style>#gws-output-pages-elements-homepage_additional_languages_als{font-size:small; margin-bottom:24px}#SIVCob{color:#3c4043; display:inline-block; line-height:28px; }#SIVCob a{padding:0 3px}.H6sW5{display:inline-block; margin:0 2px; white-space: nowrap}.z4hgWe{display:inline-block; margin:0 2px}</style><div id="SIVCob">Google offered in: <a href="https://www.google.com/setprefs?sig=0_jC9Zaci4HY0dFOCERM22YlQeaE%3D&hl=hi&source=homepage&sa=X&ved=0ahUKEwjEw7yt1rSCAxV3k4kEHVhYAEcQ2ZgBCAU">हिन्दी</a> <a href="https://www.google.com/setprefs?sig=0_jC9Zaci4HY0dFOCERM22YlQeaE%3D&hl=bn&source=homepage&sa=X&ved=0ahU
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KEwjEw7yt1rSCAxV3k4kEHVhYAEcQ2ZgBCAY">বাংলা ଓঠুৱা মরাঠী தமிழ் ગુજરાતી ಕನ್ನಡ മലয়ালম ਪੰਜਾਬੀ </div></div><div style="font-size:10pt"><div id="WqQANb" style="margin:19px auto;text-align:center">AdvertisingBusiness SolutionsAbout GoogleGoogle.co.in</div></div><p style="font-size:8pt;color:#70757a">© 2023 - Privacy - Terms</p></center>, <script nonce="VTSap2-usiUhKr58VhEGLg">(function(){window.google.cdo={height:757,width:1440};(function(){var a=window.innerWidth,b=window.innerHeight;if(!a||!b){var c=window.document,d="CSS1Compat"==c.compatMode?c.documentElement:c.body;a=d.clientWidth;b=d.clientHeight}if(a&&b&&(a!=google.cdo.width||b!=google.cdo.height)){var e=google,f=e.log,g="/client_204?&atyp=i&biw="+a+"&bih="+b+"&ei="+google.kEI,h="",k=[],l=void 0!==window.google&&void 0!==window.google.kOPI&&0!==window.google.kOPI?window.google.kOPI:null;null!=l&&k.push(["opi",l.toString()]);for(var m=0;m<k.length;m++){if(0==m||0<m)h+="&;h+=k[m][0]+"+"+"<k[m][1]>f.call(e,"","",g+h)}).call(this);}}();</script>, ' ', <script nonce="VTSap2-usiUhKr58VhEGLg">(function(){google.xjs={ck:'xjs.hp.OZLy0DasWiU.L.X.0', combam:'AAAAAAAAAAAAAAAAAAAAACiBsIhAAAAQCAABAAgAACFghCiEYACAAAIAIFSAAGAUIQgAAEBUAZgEAICAGAAAAACEfQAIAAAIAADAAAABDQYIAQqAgIAAAAIAcAgAeAGARYAAAAAAAAABCwBMHgggQAQAAAAAAAAAAAAAClp4g', cs:'ACT90oE6r2YZF3Pq_064nz6unMrMawV65A', cssam:'AAAAAAAIAAAAiBMIBAAAAAAAABAAgAAAFA BACAYACAAAAAAAIQgAAEBUAAAECAGAAAACAAAAIAAAAACABAIIYIAQAAAAAAAAQAAAAAAAGAAAAAAAGAAAAAAACAAAAAC', cssopt:false,cssss:'ACT90oGKtwWpdOHU8ymNjzPDrKxx_65Z-A', excm:[], separam:false, sepcss:false});})();</script>, ' ', <script nonce="VTSap2-usiUhKr58VhEGLg">(function(){var u='/xjs/_/js/k/x3dxjs.hp.en._jFN1-BybTE.O/am/x3dAAAAAAAAAAAAAAEAAAAAAAHAAgQAAAAAAAAAEHBHAAAsAMAF/d\x3d1/ed\x3d1/rs\x3dACT90oFU2KPMNsAyrIOCabrKAXg498BJQ/m\x3dsb_he,d,cEt90b,SNUn3,qddgKe,sTsDMc,dtl0hd,eHDf1';var amd=0;var e=this||self,f=function(a){return a};var g;var h=function(a){this.g=a};h.prototype.toString=function(){return this.g+""};var k={};var l=function(){var a=document;var b="SCRIPT";"application/xhtml+xml"==a.contentType&&(b=b.toLowerCase());return a.createElement(b)};function m(a,b){a.src=b instanceof h&&b.constructor==h?b.g:"type_error:TrustedResourceUrl";var c,d;(c=(b=null==(d=(c=(a.ownerDocument&&a.ownerDocument.defaultView||window).document).querySelector)?void 0:d.call(c,"script[nonce]"))?b.nonce||b.getAttribute("nonce")||"":"")&&a.setAttribute("nonce",c)};function n(a){a=null==a?"null":void 0==a?"undefined":a;if(void 0==g){var b=null;var c=e.trustedTypes;if(c&&c.createPolicy){try{b=c.createPolicy("goog#html",{createHTML:f,createScript:f,createScriptURL:f})}catch(d){e.console&&e.console.error(d.message)}g=b}else g=b}a=(b=g)?b:createScriptURL(a):a;return new h(a,k)};void 0==google.ps&&(google.ps=[]);function p(){var a=u,b=function(){};google.lx=google.stvsc?b:function(){q(a);google.lx=b};google.bx||google.lx()function r(a,b){b&&m(a,n(b));var c=a.onload;a.onload=function(d){c&&

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(d);google.ps=google.ps.filter(function(t){return a!==t}});google.ps.push(a);document.body.appendChild(a)}google.as=r;function q(a){google.timers&&google.timers.load&&google.tick&&google.tick("load","xjsls");var b=l();b.onerror=function(){google.ple=1};b.onload=function(){google.ple=0};google.xjsus=void 0;r(b,a);google.aple=-1;google.ps=!0;google.xjsu=u;e._F_jsUrl=u;setTimeout(function(){0<amd?google.caft(function(){return p()},amd):p(),0});}();window._=_||{};window._DumpException=_._DumpException=function(e){throw e};window._s=window._s||{};s._DumpException=_._DumpException;window._qs=window._qs||{};qs._DumpException=_._DumpException;(function(){var t=[1,0,0,0,262144,32768,8388720,33554436,524288,4096,1140,24117259];window._F_toggles=window._xjs_toggles=t;})();function _F_installCss(c){}(function(){google.jl={blt:'none',chnk:0,dw:false,dwu:true,emtn:0,end:0,ico:false,ikb:0,ine:false,injs:'none',injt:0,injth:0,injv2:false,lls:'default',pdt:0,rep:0,snet:true,strt:0,ubm:false,uwp:true;});(function(){var pmc='{\x22d\x22:{},\x22sb_he\x22:{\x22agen\x22:false,\x22cgen\x22:false,\x22client\x22:\x22heirloom-hp\x22,\x22dh\x22:true,\x22ds\x22:\x22\x22,\x22fl\x22:true,\x22host\x22:\x22google.com\x22,\x22jsonp\x22:true,\x22msgs\x22:{\x22cibl\x22:\x22Clear Search\x22,\x22dym\x22:\x22Did you mean:\x22,\x22lcky\x22:\x22I\u0026#39;m Feeling Lucky\x22,\x22lml\x22:\x22Learn more\x22,\x22psrc\x22:\x22This search was removed from your \u003Ca href\x3d\\x22/histroy\\x22\\u003EWeb History\\u003C/a\\u003E\x22,\x22psrl\x22:\x22Remove\x22,\x22sbit\x22:\x22Search by image\x22,\x22srch\x22:\x22Google Search\x22},\x22ovr\x22:{}},\x22pq\x22:\x22\x22,\x22rfs\x22:[],\x22sbas\x22:\x22 3px 8px 0 rgba(0,0,0,0.2),0 0 0 1px rgba(0,0,0,0.08)\x22,\x22stok\x22:\x22vp-RAfxJ47_jNqFCb16Up3TlcU\x22}}';google.pmc=JSON.parse(pmc);});(function(){var b=function(a){var c=0;return function(){return c<a.length?{done:!1,value:a[c++]}:{done:!0}}};var e=this||self;var g,h;a:{for(var k=["CLOSURE_FLAGS"],l=e,n=0;n<k.length;n++)if(l[l[k[n]]],null==l){h=null;break}a=h}var p=h&&h[610401301];g=null!=p?p:!1;var q,r=e.navigator;q=r?r.userAgentData||null:null;function t(a){return g?q?q.q.brands.some(function(c){return(c=c.brand)&&-1!=c.indexOf(a))}:1:!1}function u(a){var c;a:{if(c=e.navigator)if(c=c.userAgent)break;a=c;}return-1!=c.indexOf(a)}function v(){return g?!q&&0<q.brands.length:1}function w(){return u("Safari")&&!(x()||(v()?0:u("Coast"))||(v()?0:u("Opera"))||(v()?0:u("Edge"))||(v()?t("Microsoft Edge"):u("Edg/"))||(v()?t("Opera"):u("OPR"))||u("Firefox")||u("Fxios")||u("Silk")||u("Android"))}function x(){return v()?t("Chromium):(u("Chrome"))||u("CriOS"))&&!(v()?0:u("Edge"))||u("Silk")}function y(){return u("Android")&&!(x()||u("Firefox")||u("Fxios")||(v()?0:u("Opera"))||u("Silk"))}var z=v()?1:u("Trident")||u("MSIE");y();x();w();Object.freeze({});var A=!z&&!w(),D=function(a){if(/-[a-z]/.test("ved"))return null;if(A&&a.dataset){if(y()&&"ved"in a.dataset))return null;a=a.dataset.ved;return void 0==a?null:a}return a.getAttribute("data-""ved".replace(/([A-Z])/g,"-$1").toLowerCase())};var E=[],F=null;function G(a){a=a.target;var c=performance.now(),f=[],H=f.concat,d=E;if(!(d instanceof Array)){var m="undefined"!=typeof Symbol&&Symbol.iterator&&d[Symbol.iterator];if(m)d=m.call(d);else if("number"==typeof d.length)d={next:b(d)};else throw Error("a`"+String(d));for(var B=[];!(m=d.next()).done;)B.push(m.value);d=B}E=H.concat(f,d,[c]);if(a&&a instanceof HTMLElement)if(a==F){if(c=4<=E.length)c=5>(E[E.length-1]-E[E.length-4])/1E3;if(c){c=google.getEI(a);a.hasAttribute("data-ved")?f=a:D(a)|""":"";f=(f=a.closest("[data-ved]"))?D(f)||""":"";f=f||"";if(a.hasAttribute("jsname"))a=a.getAttribute("jsname");else{var C;a=null==(C=a.closest("[jsname]"))?void 0:C.getAttribute("jsname")}google.log("rcm","&ei="+c+"&ved="+f+"&jsname='"+(a||""))}else F=a,E=[c]}window.document.addEventListener("DOMContentLoaded",function(){document.body.addEventListener("click",G)}).call(this);}</script>]
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In []: