In [1]:

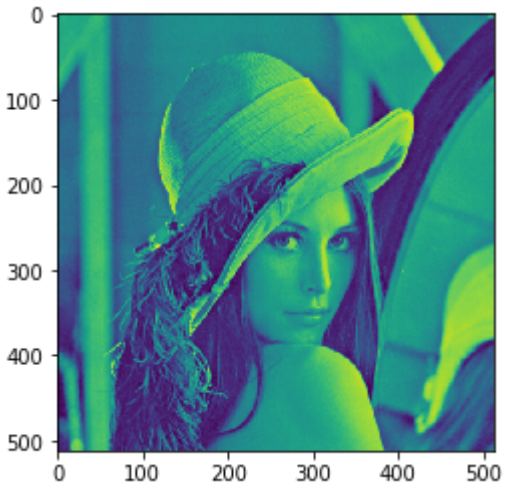
```
import numpy as np
import matplotlib.image as img
import matplotlib.pyplot as plt
import cv2
```

In [14]:

```
image=cv2.imread('D:\lenna.png',cv2.IMREAD_GRAYSCALE)
plt.imshow(image)
```

Out[14]:

```
<matplotlib.image.AxesImage at 0xe2d5df0>
```



In [15]:

```
row,col=image.shape
#convert each integer pixel value of given image to a bit pixel value of 8-bits
def intToBitArray(image):
    list=[]
    for i in range(row):
        for j in range(col):
            list.append(np.binary_repr(image[i][j],width=8))
    return list
```

In [17]:

```
imgIn1D=intToBitArray(image)
#reshaping above 1D array to a matrix aka image
imgIn2D=np.reshape(imgIn1D,(512,512))
```

In [21]:

```
def bitplane(bitImgVal,img1D):
    bitList=[int(i[bitImgVal]) for i in img1D]
    return bitList
eightbitimg=np.array(bitplane(0,imgIn1D))*128 #2^(n-1)
sevenbitimg=np.array(bitplane(1,imgIn1D))*64
sixbitimg=np.array(bitplane(1,imgIn1D))*32
fivebitimg=np.array(bitplane(1,imgIn1D))*16
fourbitimg=np.array(bitplane(1,imgIn1D))*8
threebitimg=np.array(bitplane(1,imgIn1D))*4
twobitimg=np.array(bitplane(1,imgIn1D))*2
onebitimg=np.array(bitplane(1,imgIn1D))*1
```

In [22]:

```
eight=np.reshape(eightbitimg,(row,col))
seven=np.reshape(sevenbitimg,(row,col))
six=np.reshape(sixbitimg,(row,col))
five=np.reshape(fivebitimg,(row,col))
four=np.reshape(fourbitimg,(row,col))
three=np.reshape(threebitimg,(row,col))
two=np.reshape(twobitimg,(row,col))
one=np.reshape(onebitimg,(row,col))
```

In [28]:

```
plt.subplot(331),plt.imshow(eight),plt.title("eigth")
plt.subplot(332),plt.imshow(seven),plt.title("seventh")
plt.subplot(333),plt.imshow(six),plt.title("sixth")
plt.subplot(334),plt.imshow(five),plt.title("fifth")
plt.subplot(335),plt.imshow(four),plt.title("fourth")
plt.subplot(336),plt.imshow(three),plt.title("third")
plt.subplot(337),plt.imshow(two),plt.title("second")
plt.subplot(338),plt.imshow(one),plt.title("first")
```

Out[28]:

```
(<matplotlib.axes._subplots.AxesSubplot at 0x539ecb0>,
 <matplotlib.image.AxesImage at 0x55c4210>,
 Text(0.5, 1.0, 'first'))
```