Using LBP Features to Differentiate Images by Texture

Read images that contain different textures.

```
 kapha1= imread('Tongue - murali a.jpeg');
kapha=rgb2gray(kapha1)
```

```
kapha = 256×256 uint8 matrix
   76   83   84   76   70   69   67   61   58   56   54   50   41   32   29   31 ···
   77   78   74   67   63   63   63   62   54   50   46   44   38   32   32   35
   81   75   70   68   65   61   60   61   50   44   38   36   34   31   31   33
   79   72   69   73   71   60   52   51   46   39   33   32   32   29   27   28
   76   68   65   68   65   53   43   41   39   33   30   32   32   29   26   26
   76   70   64   61   55   47   42   41   31   28   28   32   33   31   29   31
   68   69   65   57   50   46   43   39   31   29   29   32   31   29   31   36
   53   61   63   55   47   44   37   29   35   33   32   32   29   27   31   37
   64   59   52   46   41   37   33   31   30   31   31   32   33   33   34   34
   58   54   47   42   38   35   33   31   30   31   31   31   32   32   33   33
    ⋮
```

```
 pita1= imread('image - kirti kashyap.jpg');
 pita=rgb2gray(pita1)
```

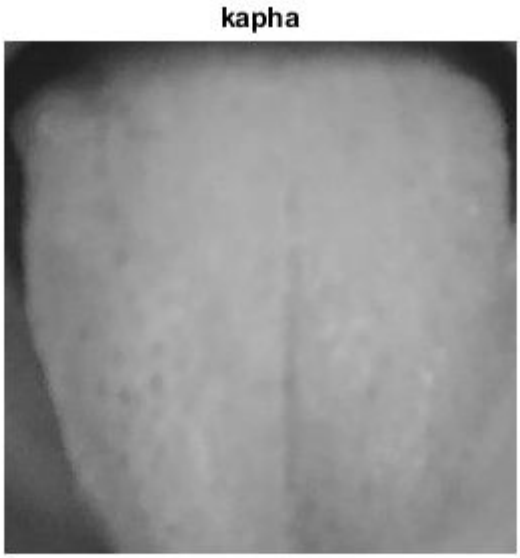
```
pita = 256×256 uint8 matrix
    97    98   100   102   102   100    98    96    99    96    95    98   103 ···
    95    96    97    98    99    99    99    98    98    96    96    97   100
    98    97    96    94    93    93    93    94    94    95    96    98   100
    91    89    87    85    84    85    87    88    92    93    95    96    96
    68    67    66    66    68    71    74    77    78    79    79    78    76
    47    46    45    44    43    44    44    45    43    43    43    45    47
    26    26    26    25    23    20    18    17    16    14    15    19    25
     9     9    10    13    14    14    13    12    16    12     9    10    16
    12    13    14    11     8     8    14    19    20    14     9    10    16
    11    13    15    14    12    11    12    15    15    10     8     9    16
    ⋮
```

```
vata1= imread('PXL_20211227_100311186 - Madhav Chauhan.jpg');
vata =rgb2gray(vata1)
```

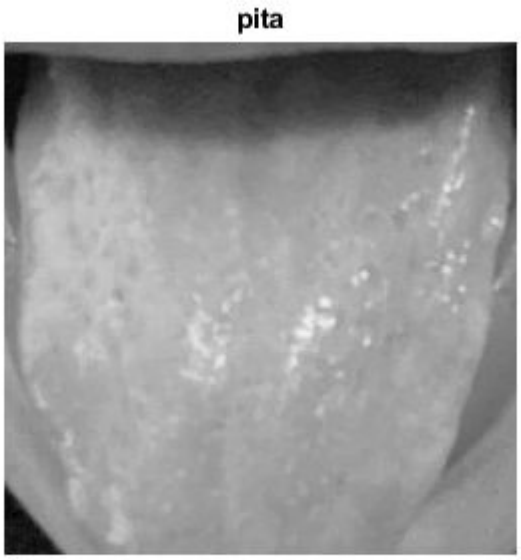
```
vata = 256×256 uint8 matrix
   100    96   105   104    88    87    95    92    91   102   115   123   127 ···
    91    94   101   102    93    92    97    98    98   106   115   118   120
    85    95    99    99   100    98    99   106   106   112   115   113   112
    90   103   101    99   105   101    98   110   110   114   116   112   109
   100   111   106   101   106   100    95   106   105   112   116   114   111
   103   109   108   105   104    97    92    95    95   104   112   113   110
    95    96   105   108   100    95    91    84    85    96   106   108   105
    84    84   100   109    98    94    91    77    79    90   101   103   100
    84    93   103   110   105    84    72    78    82    86    95   104   106
    93    94    99   100    91    82    81    84    93    94    98   105   105
    ⋮
```

Display the images.

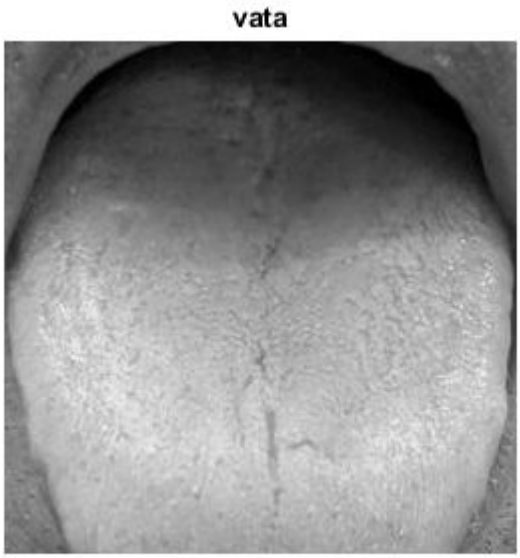
```
figure
imshow(kapha)
title('kapha')
```




```
figure
imshow(pita)
title('pita')
```




```
figure
imshow(vata)
title('vata')
```



Extract LBP features from the images to encode their texture information.

```
lbpkapha = extractLBPFeatures(kapha,'Upright',false);
lbppita = extractLBPFeatures(pita,'Upright',false);
lbpvata = extractLBPFeatures(vata,'Upright',false);
```

Gauge the similarity between the LBP features by computing the squared error between them.

```
kaphaVspita = (lbpkapha - lbppita).^2;
kaphaVsvata = (lbpkapha - lbpvata).^2;
```

Visualize the squared error to compare bricks versus bricks and bricks versus carpet. The squared error is smaller when images have similar texture.

```
figure
bar([kaphaVspita; kaphaVsvata]','grouped')
title('Squared Error of LBP Histograms')
xlabel('LBP Histogram Bins')
legend('kapha vs pita','kapha vs vata')
```