In [2]:

```
import os
import matplotlib.pyplot as plt
import numpy as np
from skimage.io import imread
from skimage.transform import resize

target = []
images = []
flat_data = []

DATADIR = '/home/sharan/Desktop/DSC_Verzeo/major project/phase_4' #folder wit
CATEGORIES = ['nonIndian', 'indian']

for category in CATEGORIES:
    class_num = CATEGORIES.index(category) #Label encoding the values
    path = os.path.join(DATADIR,category) #create path to use all the images
    for img in os.listdir(path):
        img_array = imread(os.path.join(path,img))
        #print(img_array.shape)
        #plt.imshow(img_array)
        img_resized = resize(img_array,(150,150,3)) # Normalizes the value fr
        flat_data.append(img_resized.flatten())
        images.append(img_resized)
        target.append(class_num)

flat_data = np.array(flat_data)
target = np.array(target)
images = np.array(images)

print(flat_data[0])

print(target)

unique,count = np.unique(target,return_counts=True)
plt.bar(CATEGORIES,count)
plt.show()

from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(flat_data,target, test_si

from sklearn.model_selection import GridSearchCV
from sklearn import svm
param_grid = [
              {'C':[1,10,100,1000], 'kernel':['linear']},
              {'C':[1,10,100,1000], 'gamma':[0.001,0.0001], 'kernel':['rbf']}
]
svc = svm.SVC(probability=True)
clf = GridSearchCV(svc,param_grid)
clf.fit(X_train,y_train)


y_pred = clf.predict(X_test)

print('tested: ',y_test)
print('predicted: ',y_pred)



from sklearn.metrics import accuracy_score,confusion_matrix

print('accuracy: ',accuracy_score(y_pred,y_test))

print('\nconfusion matrix: \n',confusion_matrix(y_pred,y_test))
```

```
import pickle
pickle.dump(clf,open('img_model.p','wb'))


model = pickle.load(open('img_model.p','rb'))
print('training complete\n')
```

```
[0.06728052 0.07323294 0.84294484 ... 0.6506468  0.83950431 0.98590431]
[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1]
```

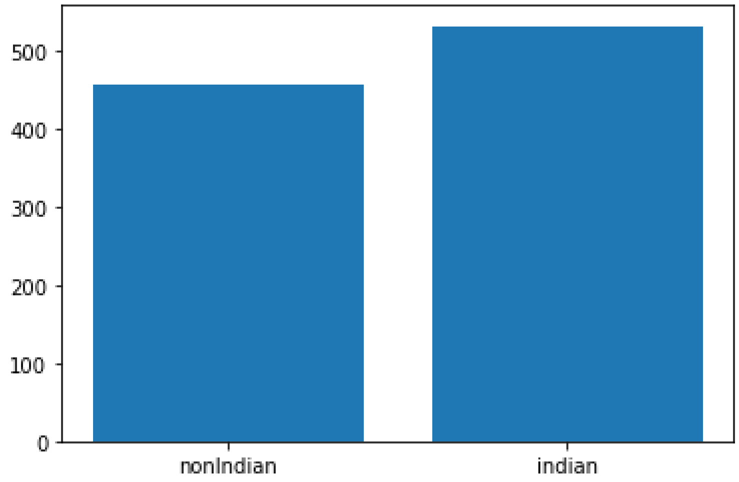

```
tested:  [1 1 1 1 1 0 0 1 0 0 0 1 1 0 0 0 1 0 0 0 1 1 0 0 1 0 1 0 1 1 1 0 0 0
1 0 1
 1 1 1 1 0 1 0 0 1 1 0 0 0 1 0 0 1 0 0 0 0 0 1 0 0 1 0 0 1 0 0 1 1 0 1 0
 0 0 1 0 0 0 0 1 1 1 1 1 1 0 0 0 0 1 1 1 0 1 1 1 0 0 0 1 0 0 0 1 0 1 0 1 1
 1 0 1 1 1 1 1 1 1 0 1 1 0 1 1 1 1 0 1 0 0 0 1 1 1 0 0 0 1 1 1 1 1 0 0 1 1
 0 1 1 1 0 1 0 0 1 0 1 1 1 0 1 0 1 0 1 1 1 0 1 0 1 0 0 0 1 1 1 1 0 1 0 0 1
 1 1 0 1 0 1 0 0 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 0 1 0 1 0 1 1 0 0 1 0 1
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 1 1 0 1 0 0 0 1 1 1 1 0 1 0 1 1 1 1 0 1 0 0 1 1 0 1 0 0 1 0 0 0 0 0 0 0 1
 0]
predicted:  [1 0 1 1 0 0 0 1 1 0 1 1 1 0 1 1 1 0 0 0 1 1 0 0 1 0 1 0 1 1 1 0
0 1 0 1 1
 1 1 1 1 0 1 0 0 1 1 0 0 0 1 0 0 1 0 0 0 1 0 0 1 1 0 1 1 0 1 0 1 1 1 0 1 0
 0 1 1 0 0 0 0 1 1 1 1 1 1 0 0 0 0 1 1 1 0 1 1 1 0 0 0 1 1 1 0 1 0 1 0 1 1
 1 0 1 0 1 1 1 1 1 1 1 1 0 1 1 1 0 1 1 0 0 0 1 1 1 0 1 0 1 1 1 1 1 1 0 1 1
 0 1 1 1 0 1 1 1 1 0 1 1 1 0 1 0 1 0 1 1 1 0 1 0 1 1 1 0 1 1 1 1 1 1 0 0 1
 1 1 0 1 0 1 0 1 1 0 0 1 1 1 1 0 0 0 0 1 1 0 0 1 0 0 1 0 1 0 1 1 0 0 1 1 1
 1 1 0 1 0 0 0 1 1 1 0 1 0 1 1 1 1 1 1 0 0 1 1 1 1 1 1 1 1 0 0 1 0 0 0 0 1
 1 1 0 1 1 1 0 0 1 1 1 0 1 0 1 1 1 1 0 1 0 0 1 0 0 1 0 1 1 1 0 1 0 0 1 0 0
 0]
accuracy:  0.8417508417508418

confusion matrix:  [[110   9]
 [ 38 140]]
training complete
```

In [3]:

```
import cv2

folder = '/home/sharan/Desktop/DSC_Verzeo/major project/phase_4/testData' #f
dest = '/home/sharan/Desktop/DSC_Verzeo/major project/phase_4/predictedIndia

def load_images(folder):
    images = []
    for filename in os.listdir(folder):
        img = cv2.imread(os.path.join(folder,filename))
        if img is not None:
            images.append(img)
    return images

images = []
images = load_images(folder)

k=1
print('testing now...\n')
for img in images :
    flat_data = []
    img_resized = resize(img,(150,150,3))
    flat_data.append(img_resized.flatten())
    flat_data = np.array(flat_data)
    print(img.shape)
    plt.imshow(img_resized)
    y_out = model.predict(flat_data)
    y_out = CATEGORIES[y_out[0]]
    if y_out == 'indian' :
        cv2.imwrite(os.path.join( dest , 'image '+str(k)+'.jpg'),img)
        k= k+1
```

```
testing now...

(499, 333, 3)
(893, 799, 3)
(200, 199, 3)
(275, 183, 3)
(259, 194, 3)
(194, 259, 3)
(237, 213, 3)
(200, 200, 3)
(188, 268, 3)
(200, 200, 3)
(301, 200, 3)
(200, 200, 3)
(200, 200, 3)
(450, 600, 3)
(200, 200, 3)
(135, 147, 3)
(725, 530, 3)
(200, 200, 3)
(141, 141, 3)
(227, 222, 3)
(200, 200, 3)
(259, 194, 3)
(200, 200, 3)
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(200, 200, 3)
(200, 200, 3)
(183, 275, 3)
(200, 200, 3)
(200, 200, 3)
(194, 259, 3)
(141, 141, 3)
(200, 200, 3)
(275, 183, 3)
(194, 259, 3)
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(194, 259, 3)
(200, 200, 3)
(176, 176, 3)
(200, 200, 3)
(225, 225, 3)
(192, 192, 3)
(275, 183, 3)
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(250, 300, 3)
(141, 141, 3)
(205, 246, 3)
(138, 150, 3)
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(275, 183, 3)
(200, 200, 3)
(209, 140, 3)
(275, 183, 3)
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(266, 189, 3)
(899, 797, 3)
(194, 259, 3)
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(141, 141, 3)
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(168, 300, 3)
(200, 200, 3)
(225, 225, 3)
(192, 262, 3)
(200, 200, 3)
(228, 221, 3)
(253, 199, 3)
(200, 200, 3)
(168, 299, 3)
(219, 175, 3)
(109, 109, 3)
```