In [63]:
```
import cv2
import matplotlib.pyplot as plt
import numpy as np
import sys
%matplotlib inline
from IPython.display import display
from PIL import Image
import glob
from sklearn import svm
```

In [64]:
```
addr1="/home/f/Desktop/binaii code/tamrin7ghayor/ones/*.png"
addr2="/home/f/Desktop/binaii code/tamrin7ghayor/twos/*.png"
addr5="/home/f/Desktop/binaii code/tamrin7ghayor/fives/*.png"
```

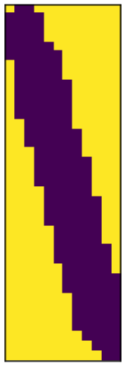
In [65]:
```
addones=glob.glob(addr1)
addtwos=glob.glob(addr2)
addfives=glob.glob(addr5)
ones1=[]
twos=[]
fives=[]
```

In [66]:
```
for i in range(len(addones)):
    img=np.array(Image.open(addones[i]))
    ones1.append(img)

for i in range(len(addtwos)):
    img=np.array(Image.open(addtwos[i]))
    twos.append(img)
for i in range(len(addfives)):
    img=np.array(Image.open(addfives[i]))
    fives.append(img)
```

In [67]:
```
ones1
```

Out[67]:
```
[array([[255,   0,   0, 255, 255, 255, 255, 255, 255, 255, 255, 255],
        [  0,   0,   0,   0, 255, 255, 255, 255, 255, 255, 255, 255],
        [  0,   0,   0,   0, 255, 255, 255, 255, 255, 255, 255, 255],
        [  0,   0,   0,   0, 255, 255, 255, 255, 255, 255, 255, 255],
        [  0,   0,   0,   0,   0, 255, 255, 255, 255, 255, 255, 255],
        [  0,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255, 255],
        [255,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255, 255],
        [255,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255, 255],
        [255,   0,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255],
        [255,   0,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255],
        [255,   0,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255],
        [255,   0,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255],
        [255, 255,   0,   0,   0,   0,   0, 255, 255, 255, 255, 255],
        [255, 255,   0,   0,   0,   0,   0,   0, 255, 255, 255, 255],
        [255, 255,   0,   0,   0,   0,   0,   0, 255, 255, 255, 255],
        [255, 255, 255,   0,   0,   0,   0,   0, 255, 255, 255, 255],
        [255, 255, 255,   0,   0,   0,   0,   0,   0, 255, 255, 255],
        [255, 255, 255,   0,   0,   0,   0,   0,   0, 255, 255, 255],
        [255, 255, 255,   0,   0,   0,   0,   0,   0, 255, 255, 255],
```

In [68]:
```
for j in ones1:
    plt.imshow(j)
    plt.xticks([]),plt.yticks([])
    plt.show()

for j in twos:
    plt.imshow(j)
    plt.xticks([]),plt.yticks([])
    plt.show()
for j in fives:
    plt.imshow(j)
    plt.xticks([]),plt.yticks([])
    plt.show()
```



descriptor

In [69]:
```
def descriptor(img):
    dim=(3,3)
    resize=cv2.resize(img,dim,interpolation=cv2.INTER_LINEAR)
    return resize.flatten()
```

In [70]:
```
descriptor(ones1[0])
```

Out[70]:
```
array([  0, 127, 255, 255,   0, 255, 255, 255,   0], dtype=uint8)
```

Train

In [71]:
```
x=[]
y=[]
for i in ones1:
    des=descriptor(i)
    x.append(des)
    y.append(1)
for i in twos:
    des=descriptor(i)
    x.append(des)
    y.append(2)
for i in fives:
    des=descriptor(i)
    x.append(des)
    y.append(5)
```

In [73]:
```
clf=svm.SVC()
clf.fit(x,y)
```

```
/home/f/anaconda3/lib/python3.7/site-packages/sklearn/svm/base.py:193: FutureWar
ning: The default value of gamma will change from 'auto' to 'scale' in version
0.22 to account better for unscaled features. Set gamma explicitly to 'auto' or
'scale' to avoid this warning.
  "avoid this warning.", FutureWarning)
```

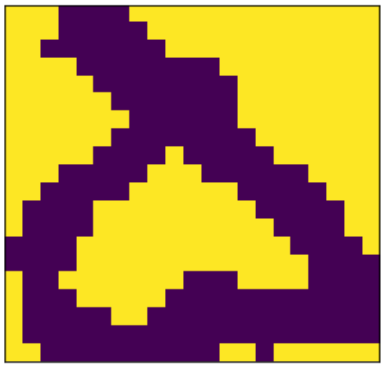
Out[73]:
```
SVC(C=1.0, cache_size=200, class_weight=None, coef0=0.0,
    decision_function_shape='ovr', degree=3, gamma='auto_deprecated',
    kernel='rbf', max_iter=-1, probability=False, random_state=None,
    shrinking=True, tol=0.001, verbose=False)
```

In [78]:
```
addrt="/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/*.png"
datatest=glob.glob(addrt)
datatest
```

Out[78]:
```
['/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2188.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/2-4132.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2139.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/5-10155.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/5-10143.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2189.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/5-10004.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2038.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/2-4060.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2185.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/5-10178.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/5-10058.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/5-10013.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2071.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2170.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2168.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/1-2155.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/5-10168.png',
 '/home/f/Desktop/binaii code/tamrin7ghayor/HodaSmallSubset/2-4114.png',
```

In [84]:
```
tests=[]
predict=[]
for i in range(len(datatest)):
    img=np.array(Image.open(datatest[i]))
    tests.append(img)
for j in tests:
    des=descriptor(j)
    res=clf.predict([des])
    predict.append(res)
```

In [91]:
```
for i in range(len(predict)):
    #if(predict[i][0]==1):
       #  plt.imshow(tests[i])
        # plt.xticks([]),plt.yticks([])
         #plt.show()
    if(predict[i][0]==5):
         plt.imshow(tests[i])
         plt.xticks([]),plt.yticks([])
         plt.show()
```



In [ ]:
```
```