

Part c)

i)

```
%function [f,fnames]=extract_boundary_features(mask)
fnames=cell(10,1);
f=nan(10,1);
B=bwboundaries(mask,'noholes');
% selecting the biggest boundary (even with noholes option a few results include more than one boundary)
B=B{1,1};
B(end,:)=[];
clearvars i j
s=B(:,2)+1j*B(:,1);
Y=fft(s,10000);
for k=0:numel(fnames)-1
    eval(['fnames{k+1,1}='Fourier_desc_a' num2str(k) '',''])
    f(k+1) = abs(sum(Y(k*1000+1:(k+1)*1000)));
end
%end
```

ii)

```
[M,N,~]=size(imread([cd '\101_ObjectCategories\emu\image_0001.jpg']));
ann=load([cd '\Annotations\emu\annotation_0001.mat']);
mask=double(poly2mask(ann.obj_contour(1,:)+ann.box_coord(3),ann.obj_contour(2,:)+ann.box_coord(1),M,N));
[f,fnames]=extract_boundary_features(mask);
disp('f Vector (reshaped for presentation):')
```

f Vector (reshaped for presentation):

```
format shortE
disp(reshape(f,[],2))
```

1.5778e+06	1.6155e+05	1.0154e+05	7.9012e+04	7.1884e+04
7.1740e+04	8.0468e+04	1.0239e+05	1.6376e+05	1.6923e+06

```
disp('fnames Cell (reshaped for presentation):')
```

fnames Cell (reshaped for presentation):

```
disp(reshape(fnames,[],2))
```

'Fourier_desc_a0'	'Fourier_desc_a1'	'Fourier_desc_a2'	'Fourier_desc_a3'	'Fourier_desc_a4'
'Fourier_desc_a5'	'Fourier_desc_a6'	'Fourier_desc_a7'	'Fourier_desc_a8'	'Fourier_desc_a9'