Part b)

i)

```matlab
%function [f,fnames]=extract_color_features(im,mask)
% dealing with grayscale images
if size(im,3)==1
    im=repmat(im,1,1,3);
end
f=nan(30,1);
fnames=cell(30,1);
% asigning names
txt1=cell(6,1);
txt2=cell(5,1);
txt2{1,1}='mean';txt2{2,1}='std';txt2{3,1}='median';txt2{4,1}='min';txt2{5,1}='max';
ch='RGBHSV';
for i=1:6
    txt1{i,1}=ch(i);
    for j=1:5
        fnames{(i-1)*5+j,1}=[txt1{i,1} '_' txt2{j,1}];
    end
end
im=cat(3,im,rgb2hsv(im));
% assigning data
for i=1:6
    data=im(:,:,i);
    data=data(mask==1);
    for j=1:5
        eval(['f((' num2str(i) '-1)*5+' num2str(j) ',1)=' eval(['txt2{' num2str(j) ',1}']) '(data);'])
    end
end
%end
```

ii)

```matlab
im=double(imread([cd '\101_ObjectCategories\emu\image_0001.jpg']));
[M,N,~]=size(im);
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_color_features(im,mask);
disp('f Vector (reshaped for presentation):')
```

```
 f Vector (reshaped for presentation):
```

```matlab
format shortE
disp(reshape(f,[],6)')
```

```
    8.9691e+01    4.1739e+01    8.5000e+01    3.0000e+00    2.5500e+02
    6.0414e+01    3.6482e+01    5.3000e+01             0    2.5000e+02
    7.0158e+01    3.7497e+01    6.3000e+01             0    2.5500e+02
    9.3342e-01    6.4130e-02    9.4737e-01             0    9.9621e-01
    3.6189e-01    1.1088e-01    3.5000e-01    1.9608e-02    1.0000e+00
    8.9886e+01    4.1551e+01    8.5000e+01    5.0000e+00    2.5500e+02
```

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

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

```matlab
disp(reshape(fnames,[],6)')
```

```
'R_mean'    'R_std'    'R_median'    'R_min'    'R_max'
'G_mean'    'G_std'    'G_median'    'G_min'    'G_max'
'B_mean'    'B_std'    'B_median'    'B_min'    'B_max'
'H_mean'    'H_std'    'H_median'    'H_min'    'H_max'
'S_mean'    'S_std'    'S_median'    'S_min'    'S_max'
'V_mean'    'V_std'    'V_median'    'V_min'    'V_max'
```

```
'R_mean'    'R_std'    'R_median'    'R_min'    'R_max'
'G_mean'    'G_std'    'G_median'    'G_min'    'G_max'
'B_mean'    'B_std'    'B_median'    'B_min'    'B_max'
'H_mean'    'H_std'    'H_median'    'H_min'    'H_max'
'S_mean'    'S_std'    'S_median'    'S_min'    'S_max'
'V_mean'    'V_std'    'V_median'    'V_min'    'V_max'
```