BASIS IMAGE PROCESSING

Y.U.P De Silva
110108A

01.)


```
 5        %red image
 6 -      red_img = img;
 7 -      red_img(:,:,2) = zeros(h,w);
 8 -      red_img(:,:,3) = zeros(h,w);
 9 -      imshow(red_img);
10 -      title('Red Image');      pause;
```

Original Image

Red Image   Green Image   Blue Image   Grayscale Image

02.)

(i)

```
1  function z_img = zoom_nearest_neighbour(img,z_fac)
2 -      [h w c] = size(img);
3 -      z_img = uint8(zeros(h*z_fac,w*z_fac,c));
4 -      for i = 1 : h*z_fac,
5 -          for j = 1 : w*z_fac,
6 -              z_img(i,j,:) = uint8(img(ceil(i/z_fac),ceil(j/z_fac),:));
7 -          end
8 -      end
9 -  end
```
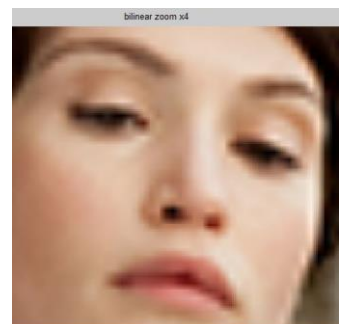
(ii) Bilinear zooming (Only the part where bilinear interpolation is done is shown due to limited space =)

```
 7 -          for zh = 0 : z_fac ,
 8 -              hu = (z_fac-zh)*img(i,j,:) + zh*img(i+1,j,:);
 9 -              hl = (z_fac-zh)*img(i,j+1,:) + zh*img(i+1,j+1,:);
10 -              for zv = 0 : z_fac ,
11 -                  z_img(i*z_fac+zh,j*z_fac+zv,:) = uint8( ((z_fac-zv)*hu + zv*hl)/power(z_fac,2));
12 -              end
13 -          end
```

Both methods give a zoomed output which looks fine

But when take a closer look at Gretel's face
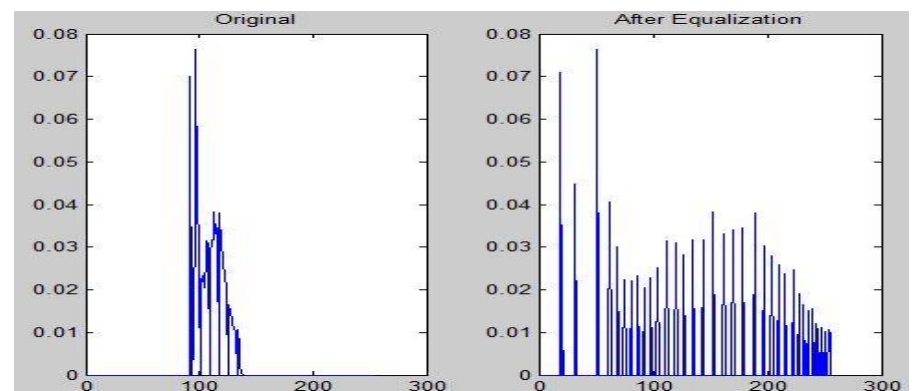
Bilinear zooming looks much better

3.)

```
16        %histogram equalization
17 -      hisequ = zeros(L,c);
18 -      imgequ = uint8(zeros(h,w,c));
19 -   ┌  for i = 1 : h
20 -   │ ┌    for j = 1 : w
21 -   │ │ ┌      for k = 1 : c
22 -   │ │ │          imgequ(i,j,k) = uint8((L-1)*cumhisto(img(i,j,k)+1,k));
23 -   │ │ │          hisequ(imgequ(i,j,k)+1) = hisequ(imgequ(i,j,k)+1) + 1;
24 -   │ │ └      end
25 -   │ └    end
26 -   └  end
```


4.)