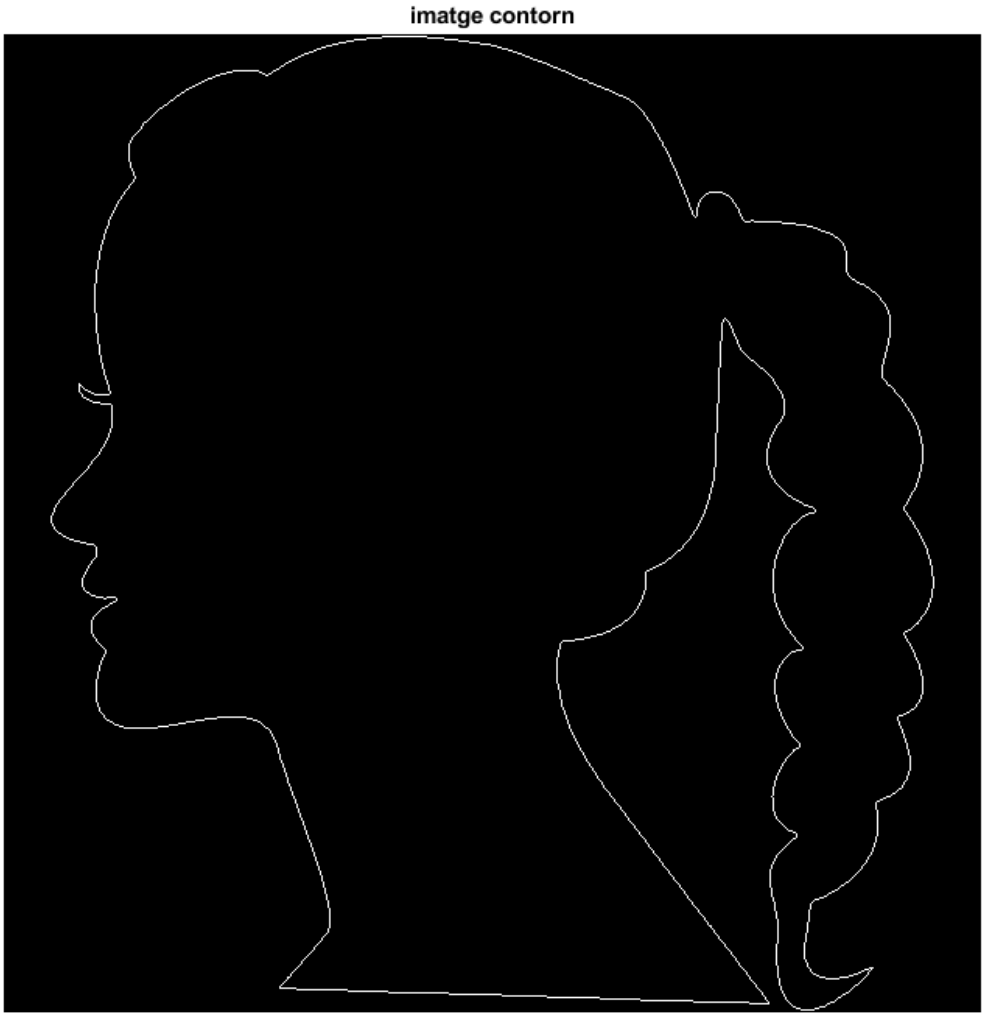
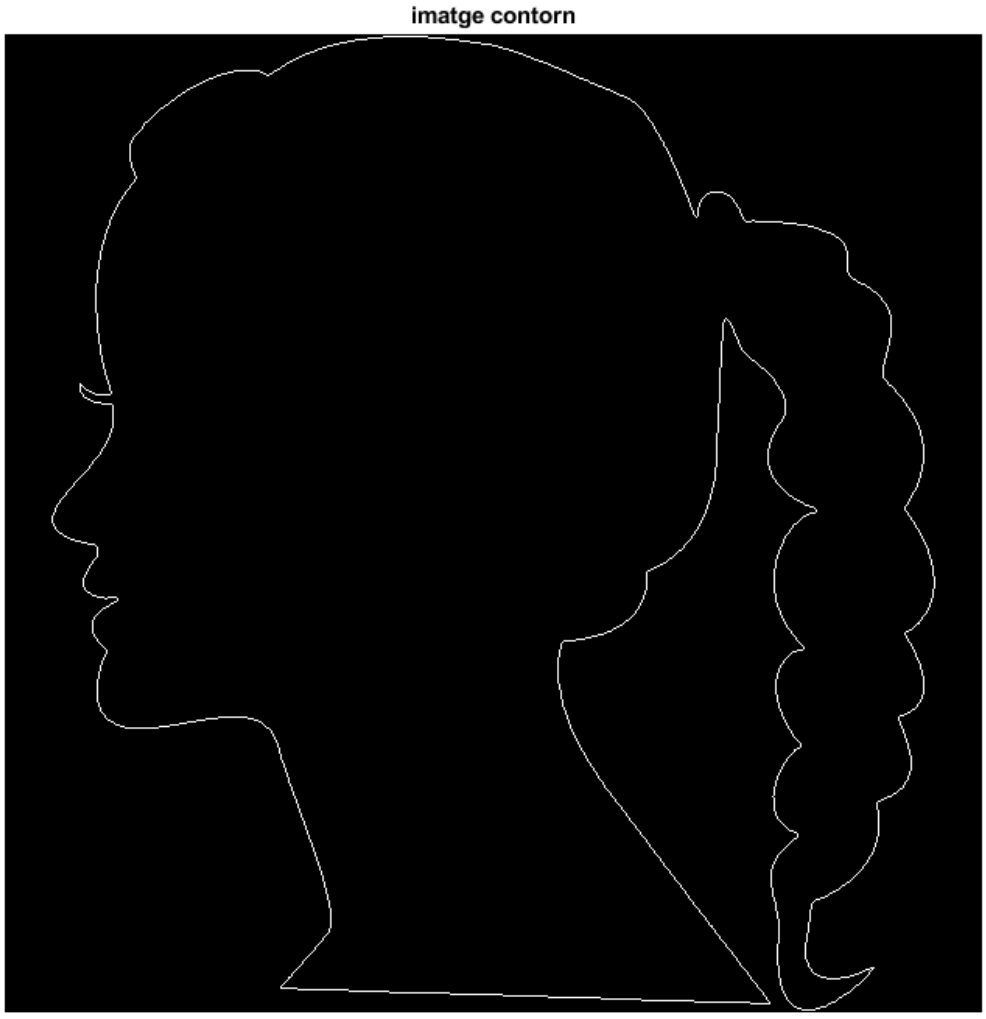
```
im = imread('head.png');
figure, imshow(im), title("original")
cont=xor(im,imerode(im, strel('disk', 1)));
figure, imshow(cont), title('imatge contorn')
```



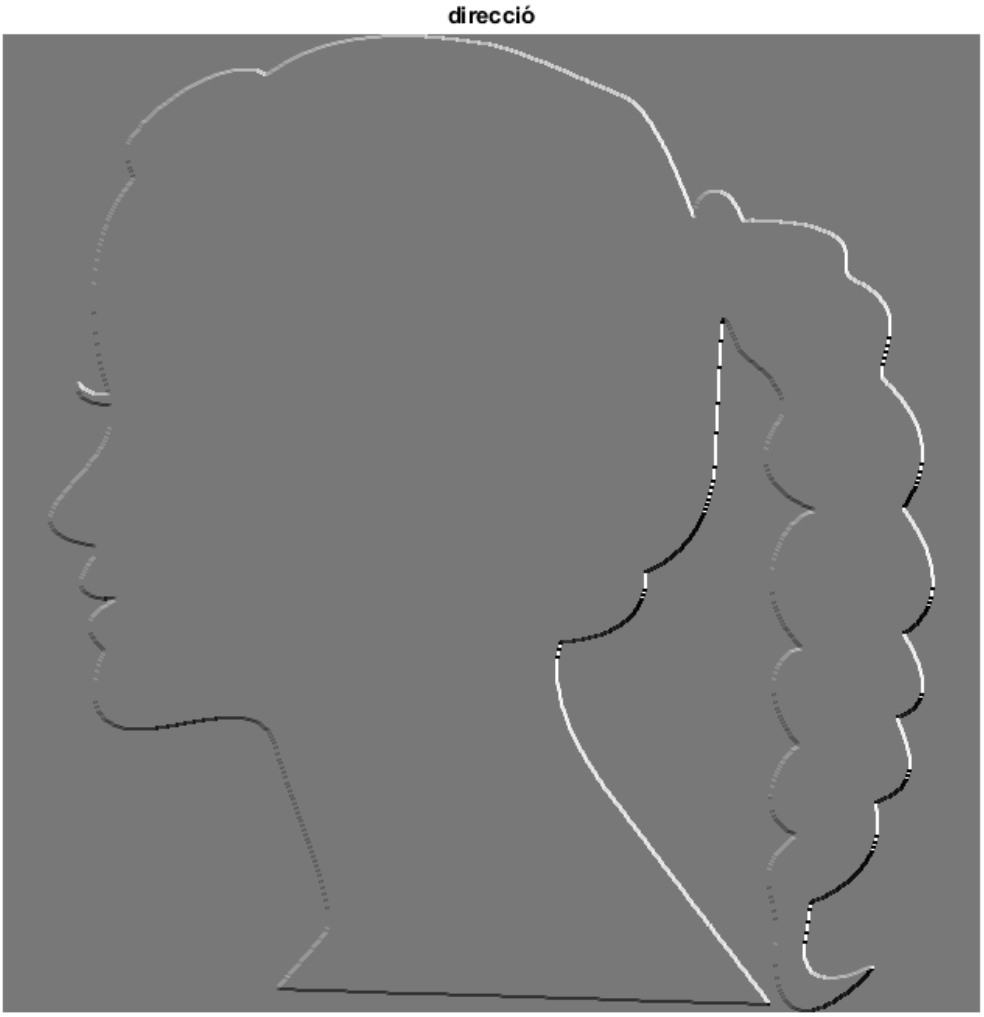
gradient i direcció

```
h=[1,2,1;0,0,0;-1,-2,-1];
h=h/4;
Gy=imfilter(double(im),h,'conv'); % gradient vertical
Gx=imfilter(double(im),h','conv'); % gradient horitzontal
figure, imshow(Gy,[]), title('imatge gycont')
figure, imshow(Gx, []), title('imatge gxcont')
dir=atan2(Gy,Gx); % direcció
figure, imshow(dir, []), title('direcció')
```


imatge contorn

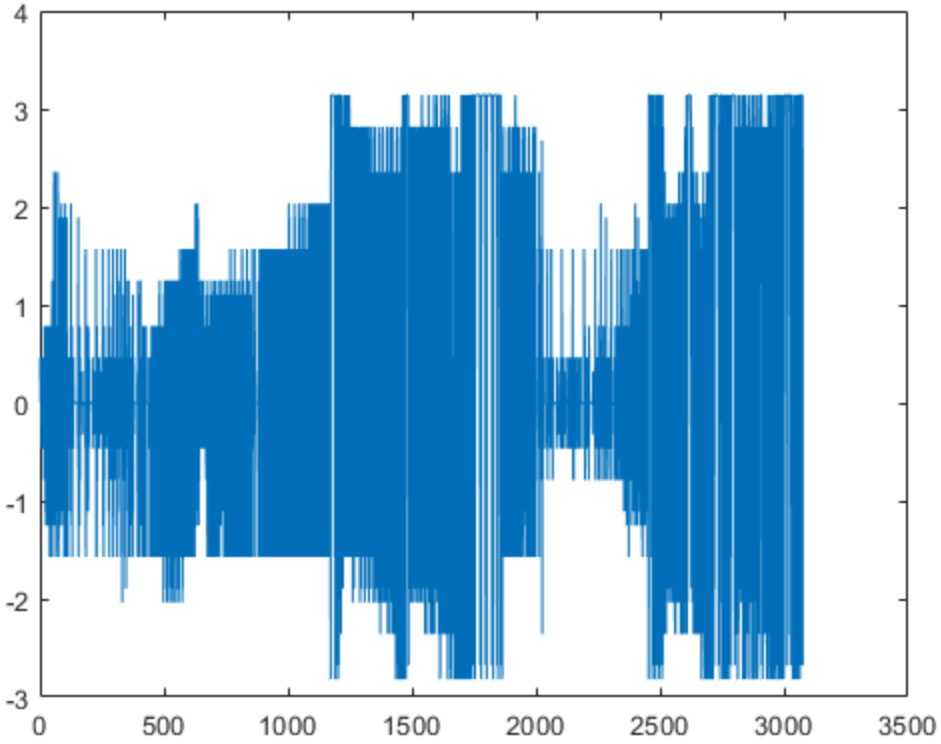
imatge gycont

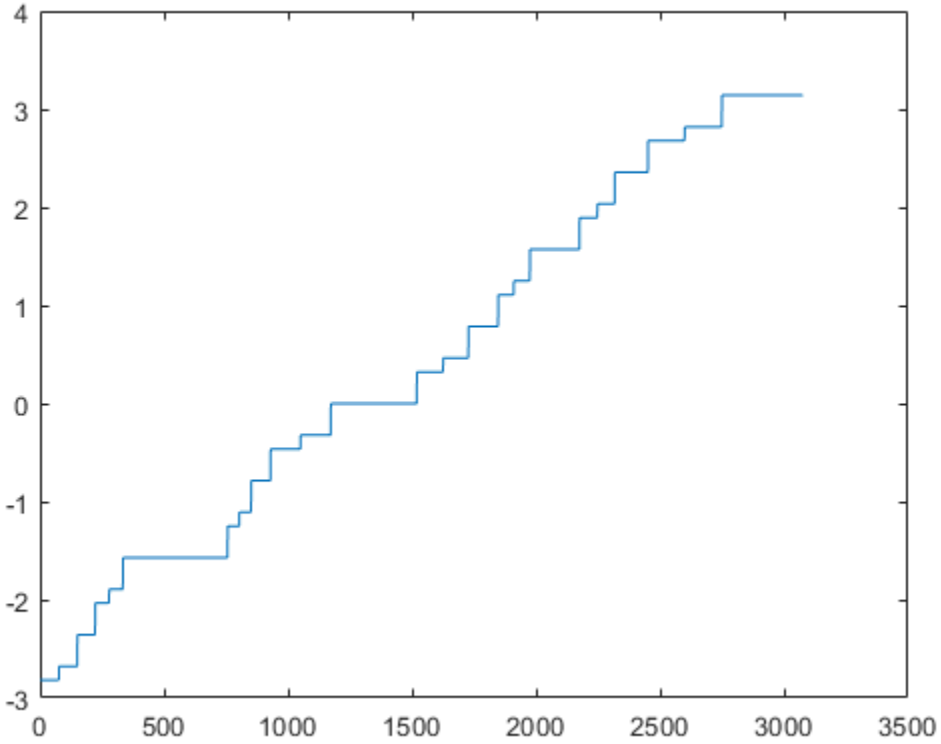
imatge gxcont



plot

```
res = dir(cont==1);
figure, plot(res)
b = sort(res);
figure, plot(b)
```


4
3
2
1
0
-1
-2
-3
0
500
1000
1500
2000
2500
3000
3500


4
3
2
1
0
-1
-2
-3
0
500
1000
1500
2000
2500
3000
3500

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