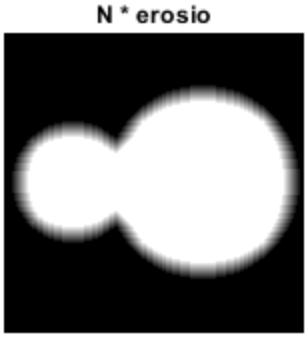
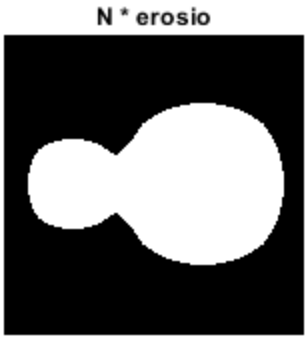
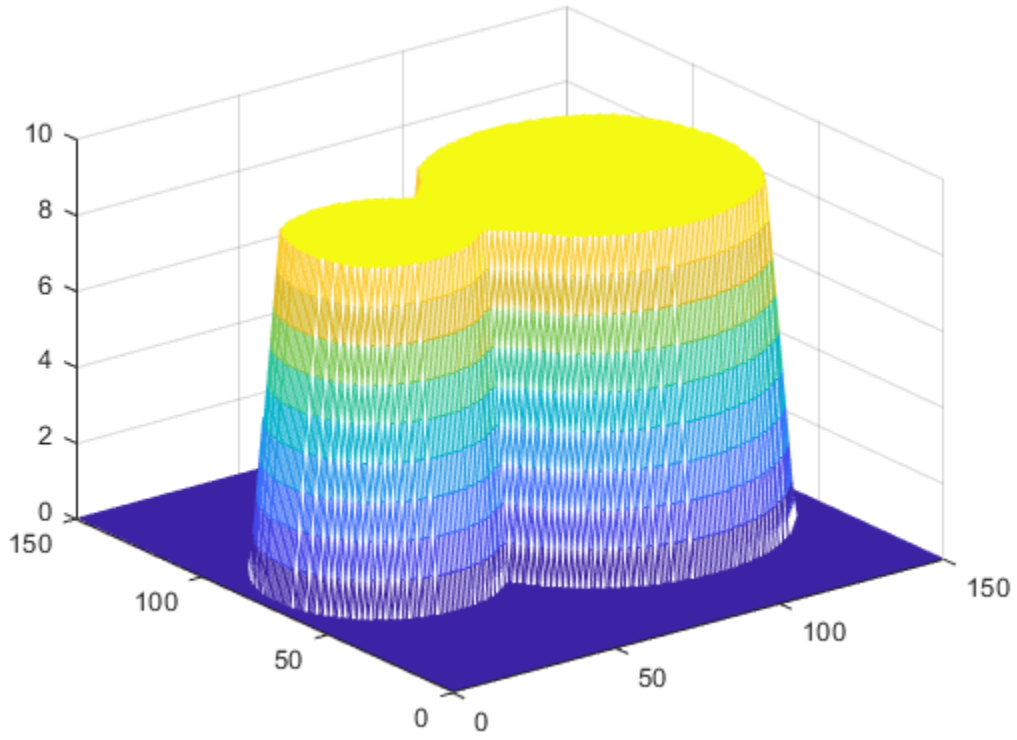
```
cd('I:\vc\sample images')
im=imread('touchcell.tif');
imshow(im),title('imatge original')
ee=strel('disk',1);
ero=imerode(im,ee);
figure,imshow(ero),title('erosio');
res=xor(im,ero);
figure,imshow(res),title('residu')
```

erosionem la imatge i el resultat l'acumulem a tdist

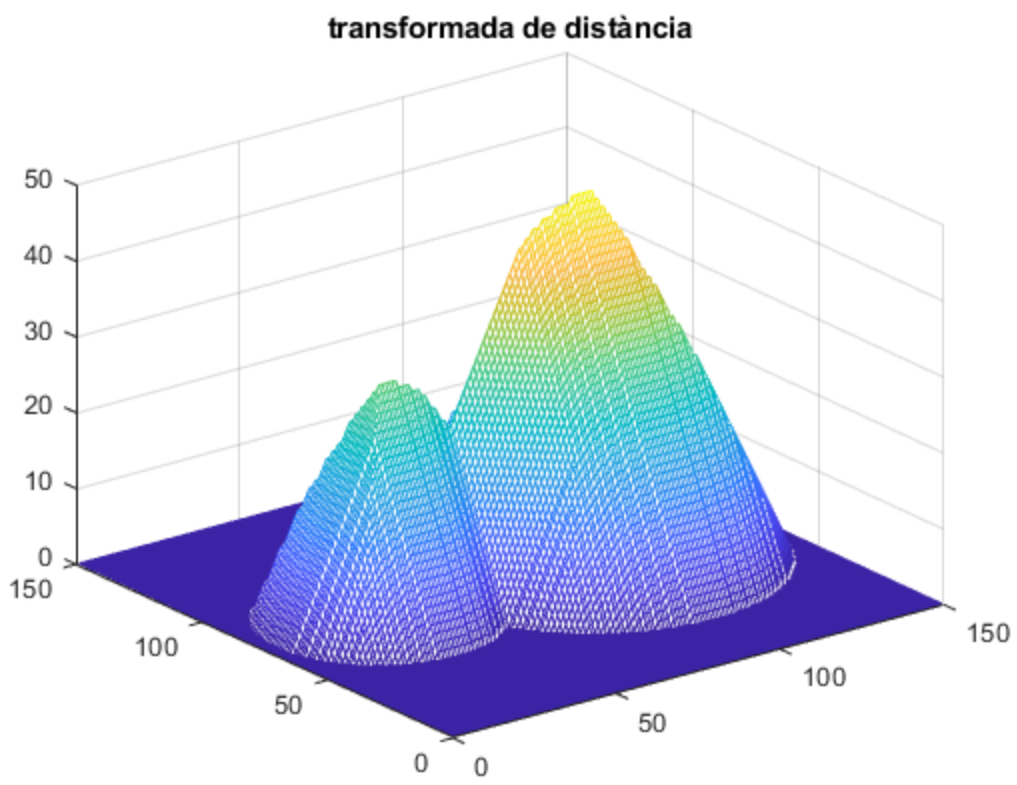
```
tdist=double(im);
tdist=tdist+ero;
ero=imerode(ero,ee);tdist=tdist+ero;
ero=imerode(ero,ee);tdist=tdist+ero;
ero=imerode(ero,ee);tdist=tdist+ero;
ero=imerode(ero,ee);tdist=tdist+ero;
ero=imerode(ero,ee);tdist=tdist+ero;
ero=imerode(ero,ee);tdist=tdist+ero;
ero=imerode(ero,ee);tdist=tdist+ero;
figure,imshow(tdist, []),title('N * erosio')
figure,imshow(ero, []),title('N * erosio')
figure,mesh(tdist)
```



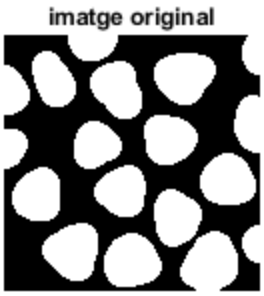


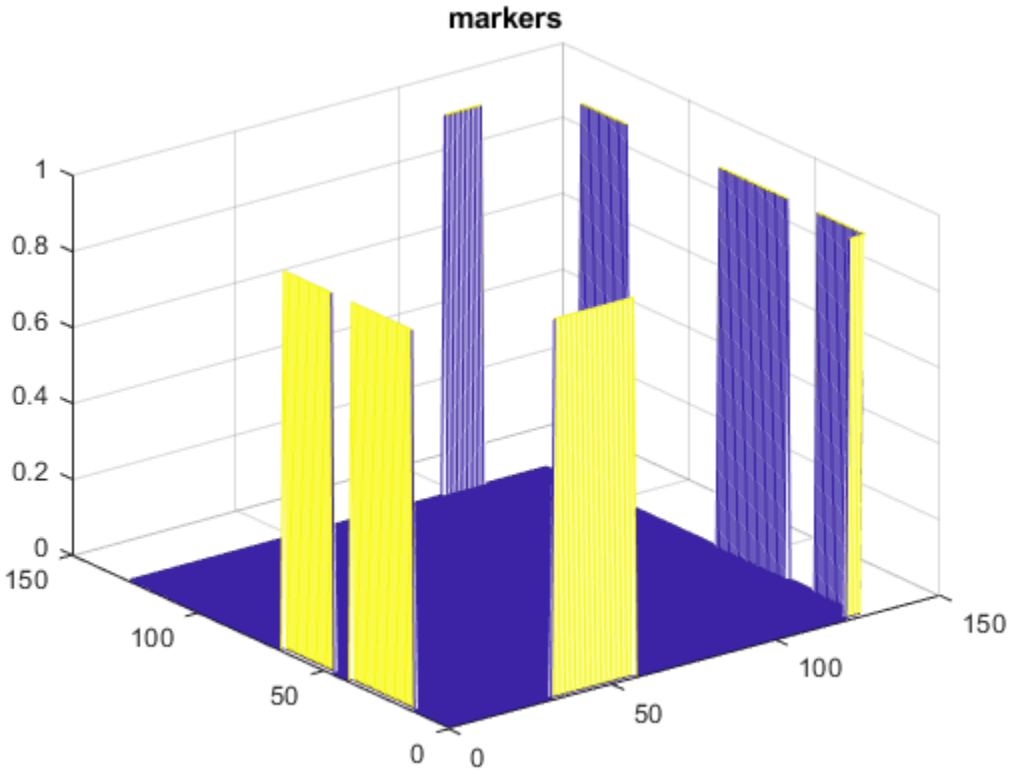



```
%Erosionem la imatge fins que no quedi res a la imatge
while (any(ero(:)))
    ero = imerode(ero,ee); tdist = tdist+ero;
end
figure,mesh(tdist),title('transformada de distància')
```




```
%Creem les marques de la imatge
im=imread ('blob3.tif');
imshow(im), title('imatge original')
mark=im;
mark(2:end-1,2:end-1)=0;
figure,mesh(mark),title('markers')
figure,imshow(mark),title('markers')
dil=imdilate(mark,ee);
%agrandem un pixel les marques amb dilatacion condicionals, es tracta d'una
%reconstrucció
dilc=dil&im;
figure,imshow(dilc),title('dilatacio condicional')
dilc=imdilate(dilc,ee)&im;
dilc=imdilate(dilc,ee)&im;
dilc=imdilate(dilc,ee)&im;
dilc=imdilate(dilc,ee)&im;
dilc=imdilate(dilc,ee)&im;
dilc=imdilate(dilc,ee)&im;
dilc=imdilate(dilc,ee)&im;
dilc=imdilate(dilc,ee)&im;
figure,imshow(dilc),title('dilatacio condicional')
```


imatge original

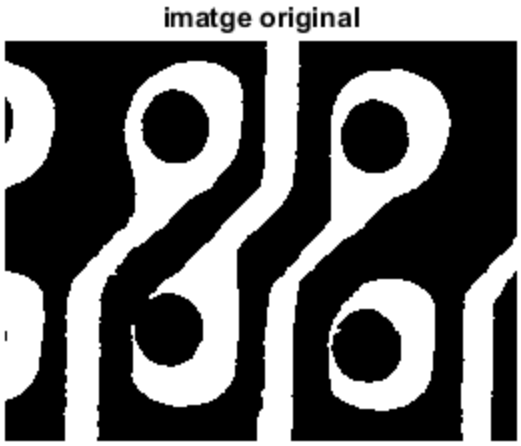

markers
1
0.8
0.6
0.4
0.2
0
150
100
50
0
0
50
100
150

reconstruccions

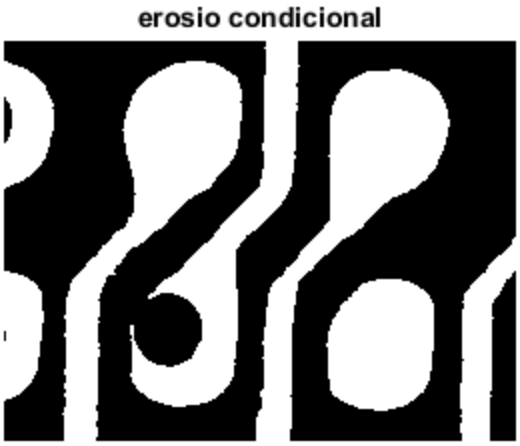
```
rec = imreconstruct(mark,im);
figure,imshow(rec),title('reconstruccio')
rec = imsubtract(im,rec);
figure,imshow(rec),title('resultat final')
```

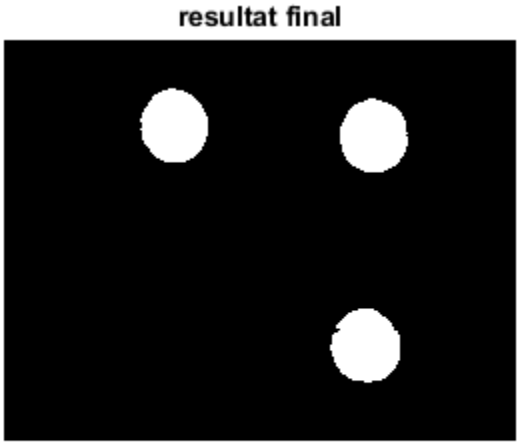
Exercici: obtindre els forats (erosio per als negres, dilatacio per als blancs)

```
im = imread('pcbholes.tif');
imshow(im),title('imatge original')

% la imatge de marques sera de les regions aillades
mark=im;
mark(2:end-1,2:end-1)=1;
figure,imshow(mark),title('markers')

ero=imerode(mark,ee);
tdist=double(mark);

eroc = ero|im;

n = 150;

for i=1:n
    eroc = imerode(eroc,ee)|im; tdist = tdist+eroc;
end

figure,imshow(eroc),title('erosio condicional')

rec =  imsubtract(eroc,im);
figure,imshow(rec),title('resultat final')
```

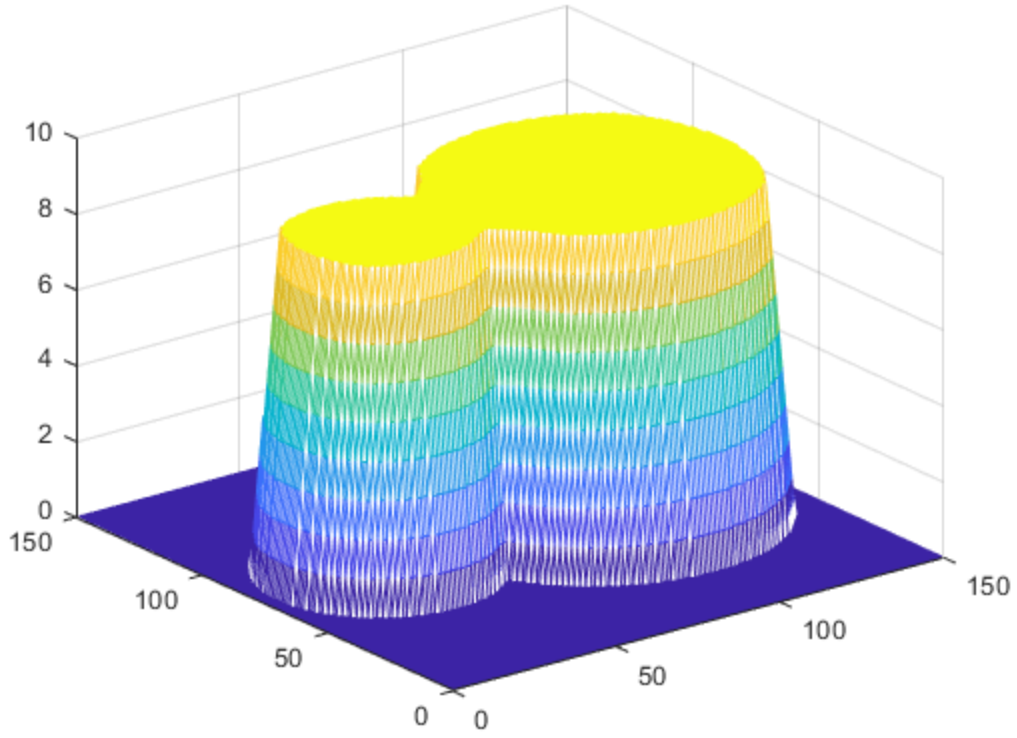

imatge original

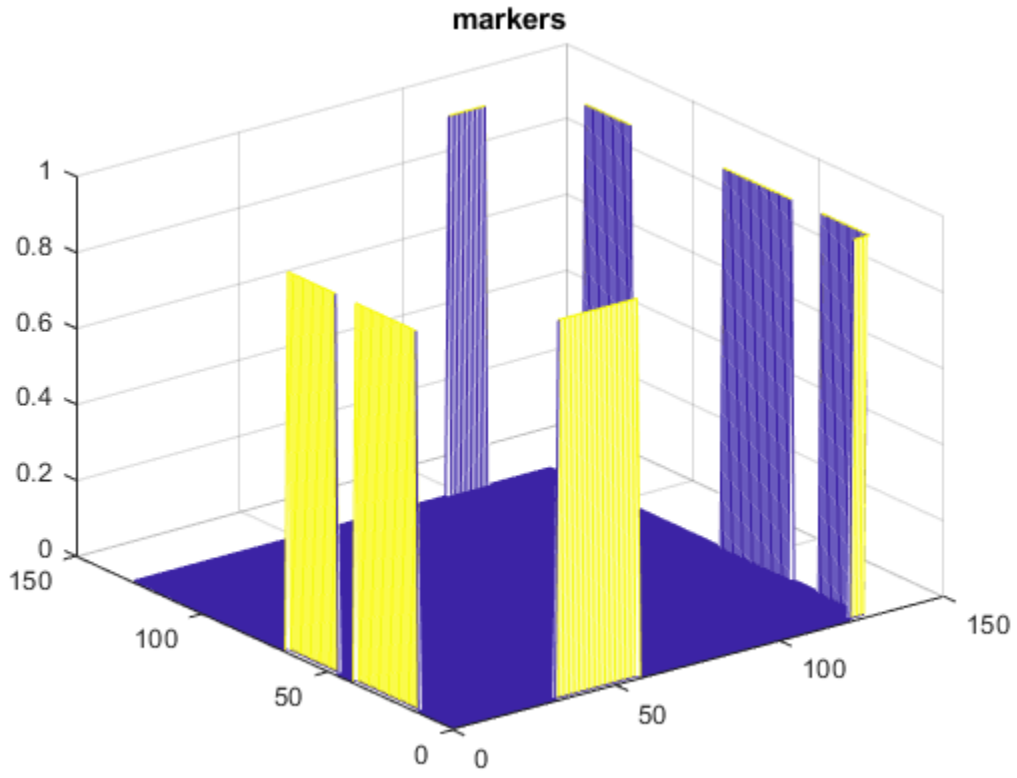

markers

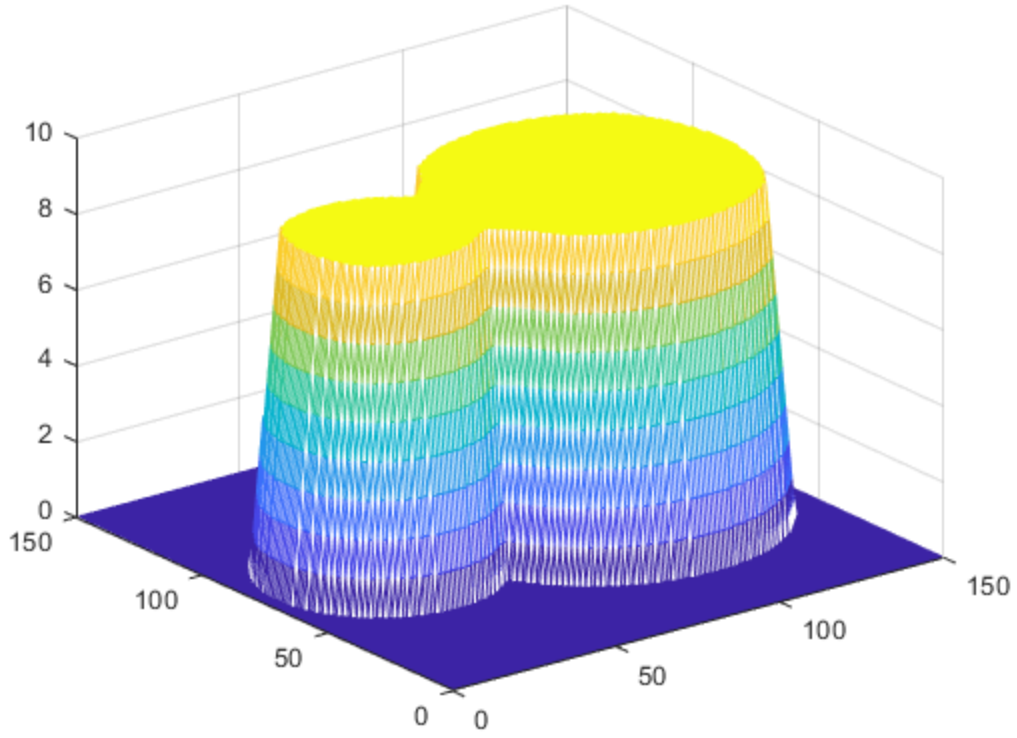


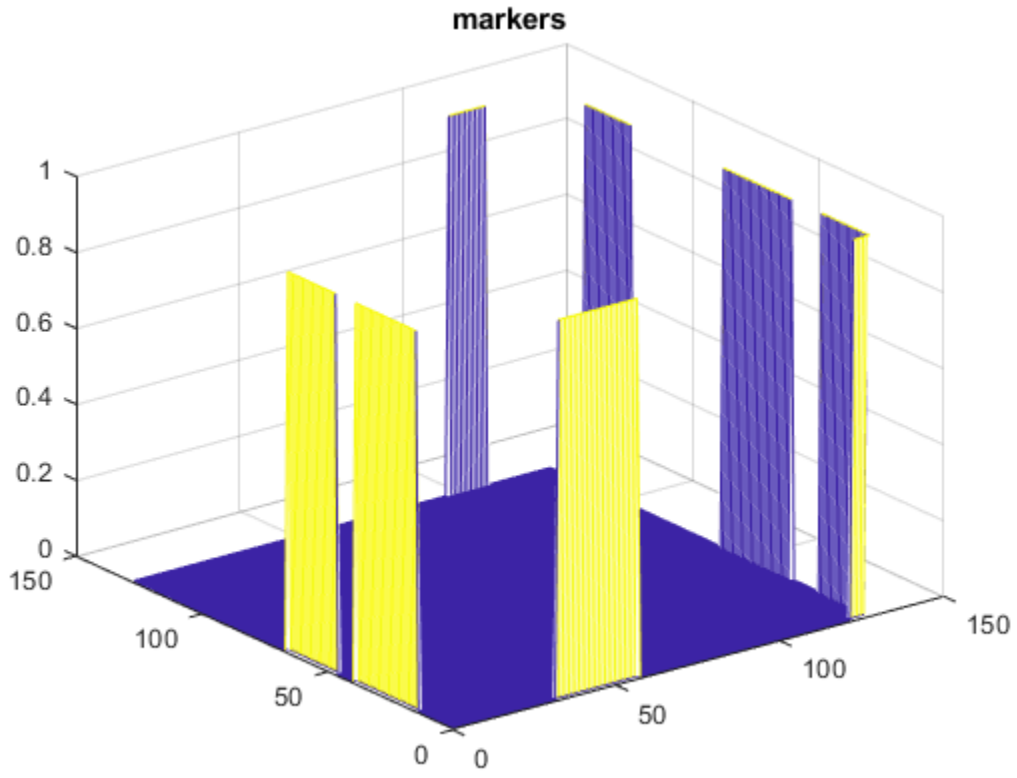


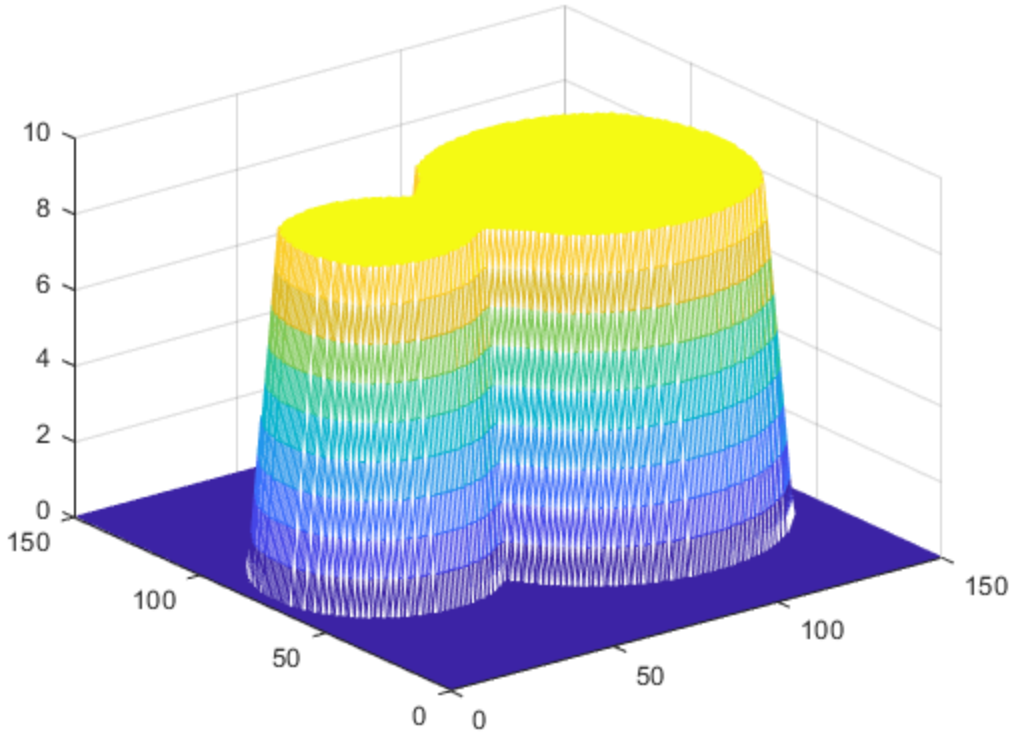

```
im = imread('tools.tif');
imshow(im),title('imatge original')
ee = strel('disk',7);
ero = imerode(im,ee);
figure,imshow(ero),title('markers')
rec=imreconstruct(ero,im);
figure,imshow(rec),title('resultat')
ee = strel('rectangle', [10,35]);
ero = imerode(im,ee);
figure,imshow(ero),title('markers')
rec=imreconstruct(ero,im);
figure,imshow(rec),title('clau anglesa')
```

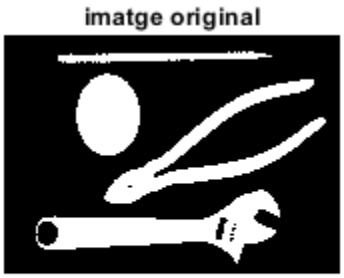

10
8
6
4
2
0
150
100
50
0
0
50
100
150


markers
1
0.8
0.6
0.4
0.2
0
150
100
50
0
0
50
100
150


10
8
6
4
2
0
150
100
50
0
0
50
100
150


markers
1
0.8
0.6
0.4
0.2
0
150
100
50
0
0
50
100
150

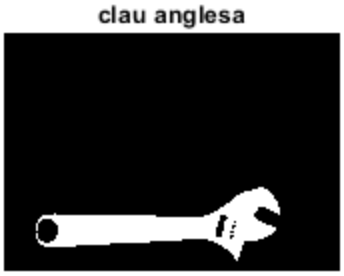

10
8
6
4
2
0
150
100
50
0
0
50
100
150


imatge original

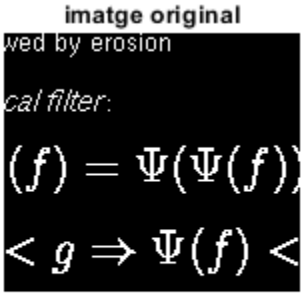
markers

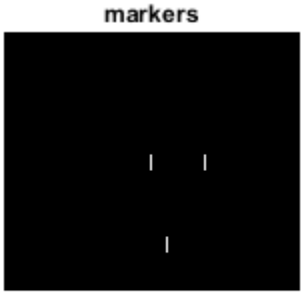
resultat

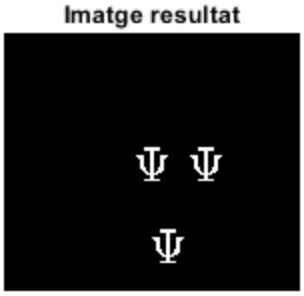
markers




```
im = imread('letters.tif');
imshow(im),title('imatge original')
ee = strel('rectangle', [10,2]);
ero = imerode(im,ee);
figure,imshow(ero),title('markers')
rec=imreconstruct(ero,im);
figure,imshow(rec),title('Imatge resultat')
```







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