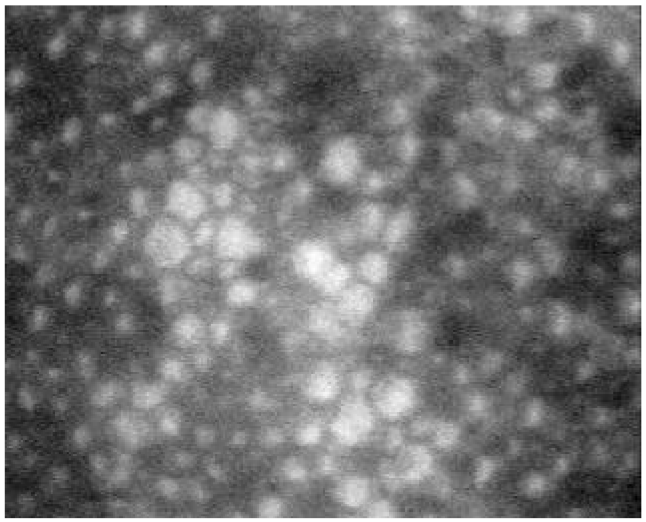
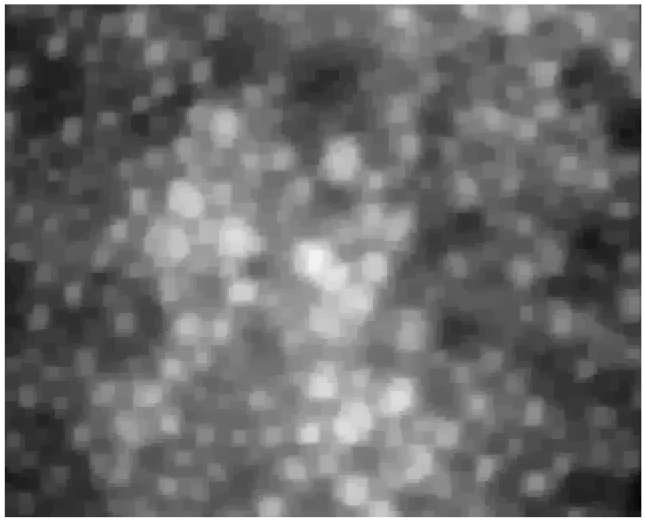
Sesion 7Bis - 14/04

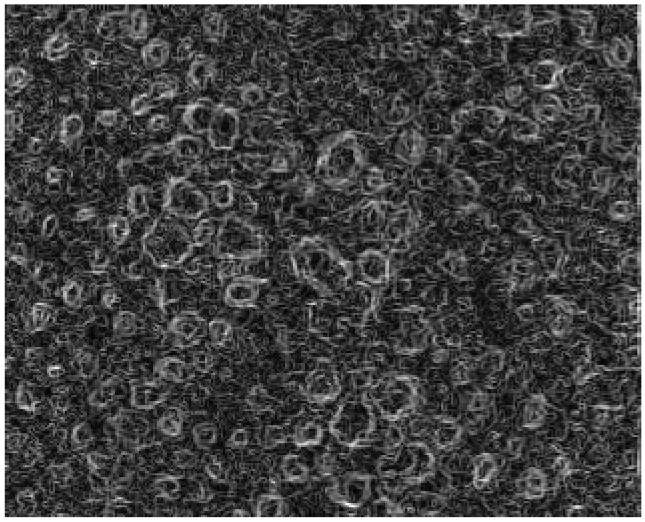
```
% exercici cornea (correcció) -> faltava el G = imimposemin(G,SKIZ|MR);
I = imread("cornea.tif");
imshow(I);
```



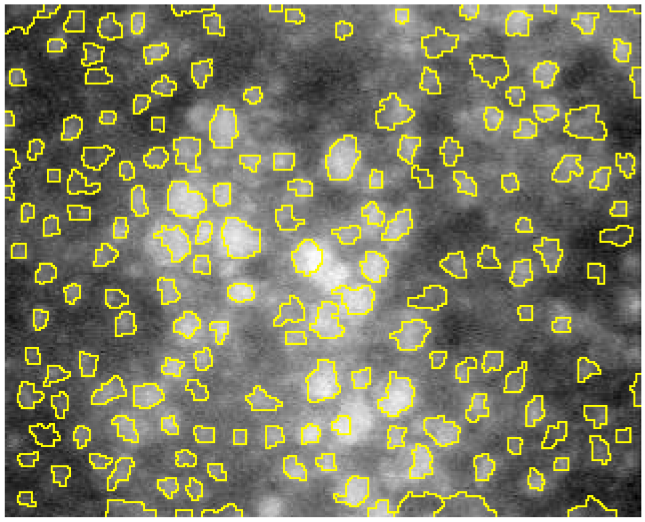
```
% filtrat
IF = imopen(I,strel("disk",3));
IF = imclose(IF,strel("disk",3));
imshow(IF);
```



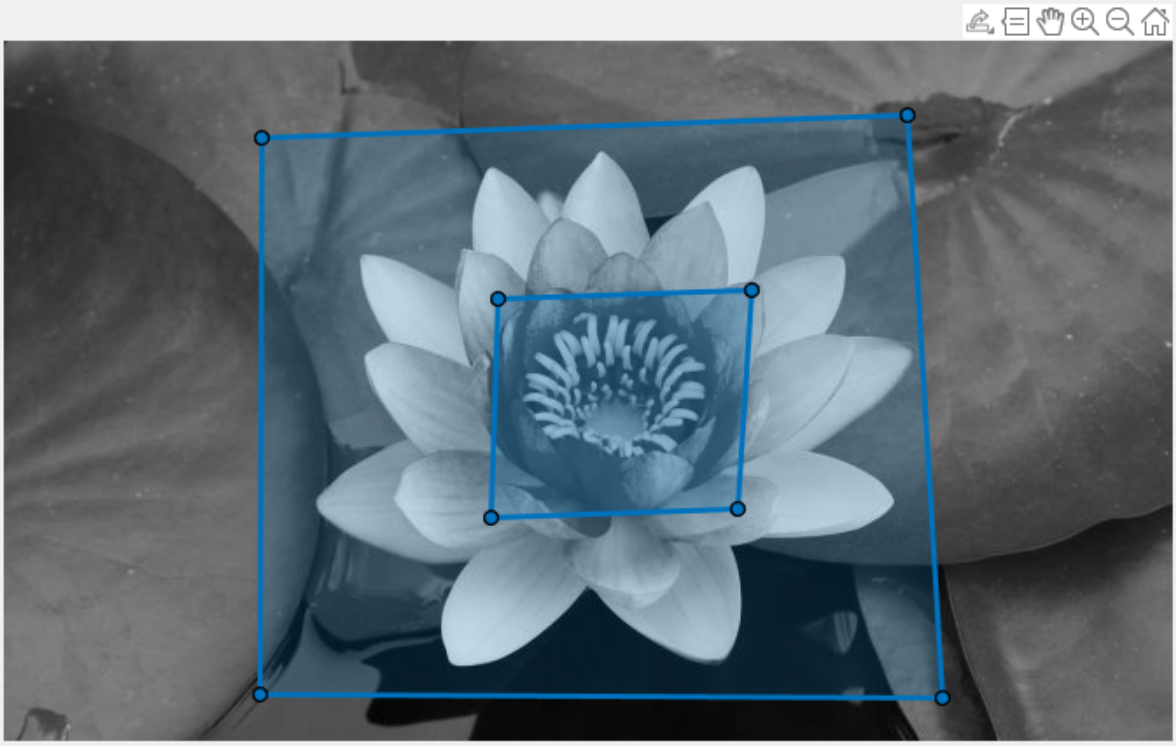
```
% maxim regionals
MR = imregionalmax(IF);

% SKIZ
SK = bwskel(not(MR));
SKIZ = bwmorph(SK,'spur',Inf);
SKIZ = SKIZ & not(bwhitmiss(SKIZ, [-1 -1 -1; -1 1 -1; -1 -1 -1]));

% imatge gradient
G = uint8(imgradient(I));
imshow(G,[]);
```



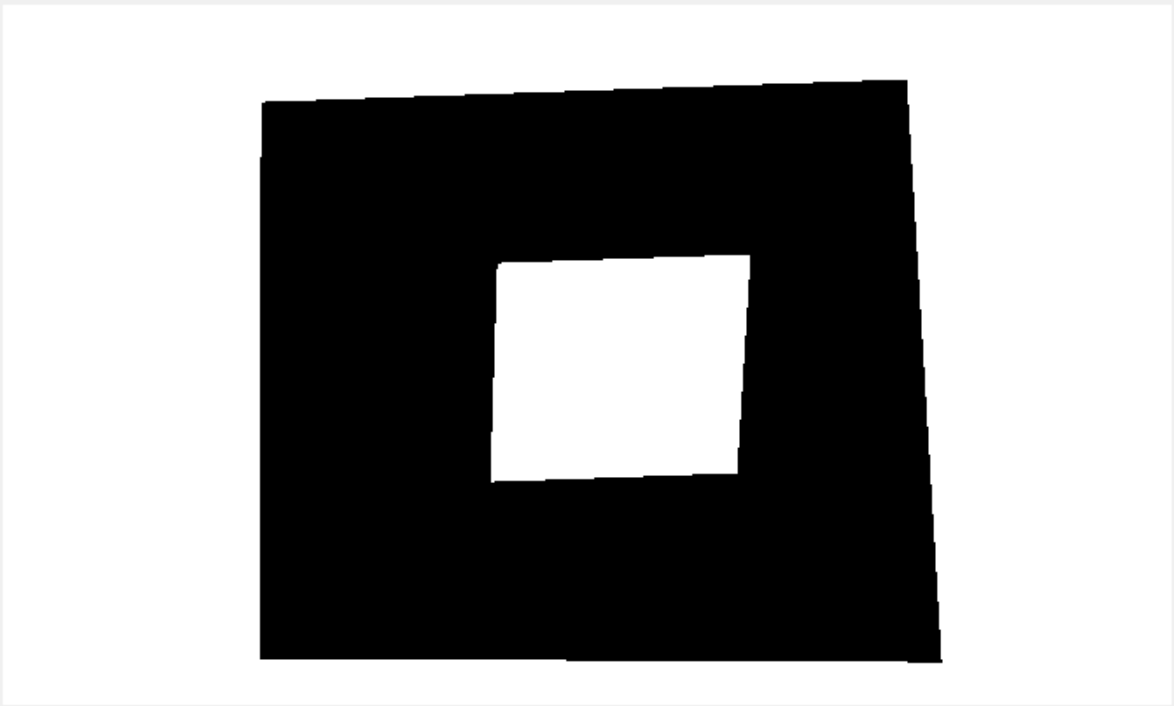
```
%markers
G = imimposemin(G,SKIZ|MR);

% WS
WS = watershed(G); % aquesta G ha de tenir minim locals (amb la transf. de la dist)

IB = WS == 0; % image borders
RGB = imoverlay(I,IB);
imshow(RGB);
```



```
% segmentació assistida

I = rgb2gray(imread('nenufar.jpg'));
imshow(I);
[f,c] = size(I);
roiPoints = drawpolygon;
BK = not(poly2mask(roiPoints.Position(:,1), roiPoints.Position(:,2),f,c));
roiPoints = drawpolygon;
```

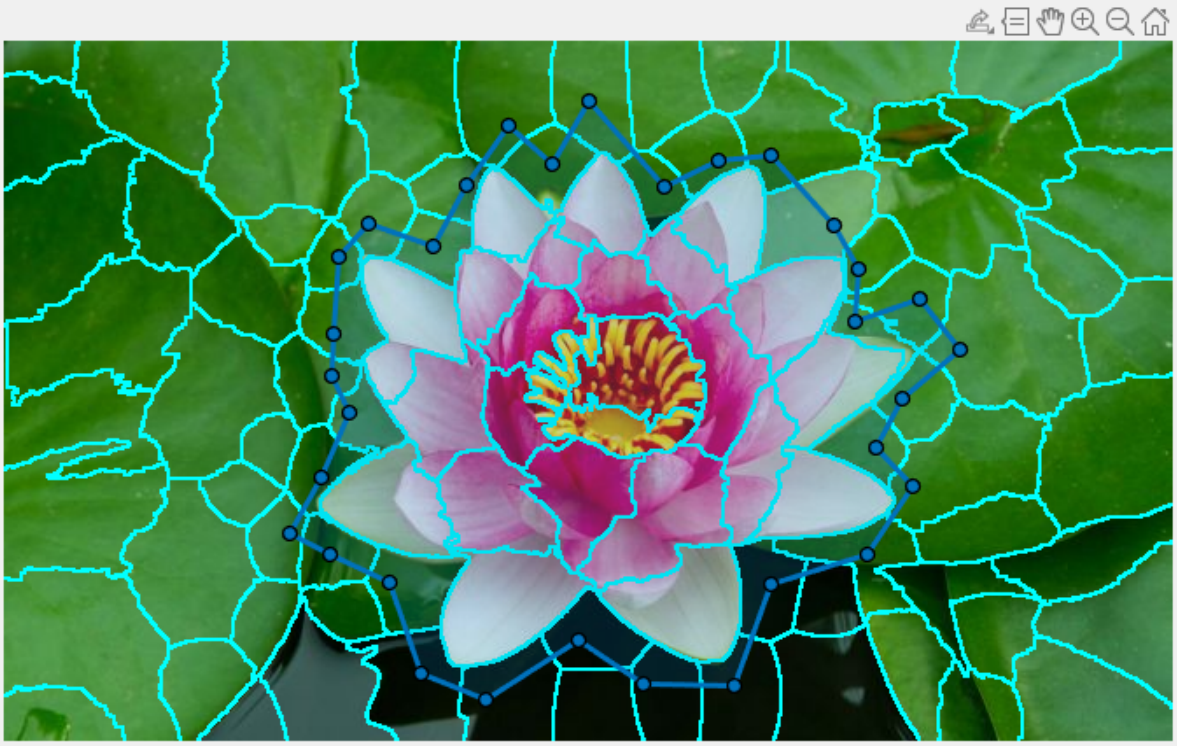


```
FG = poly2mask(roiPoints.Position(:,1), roiPoints.Position(:,2),f,c);
MASK = BK | FG;
imshow(MASK);
```

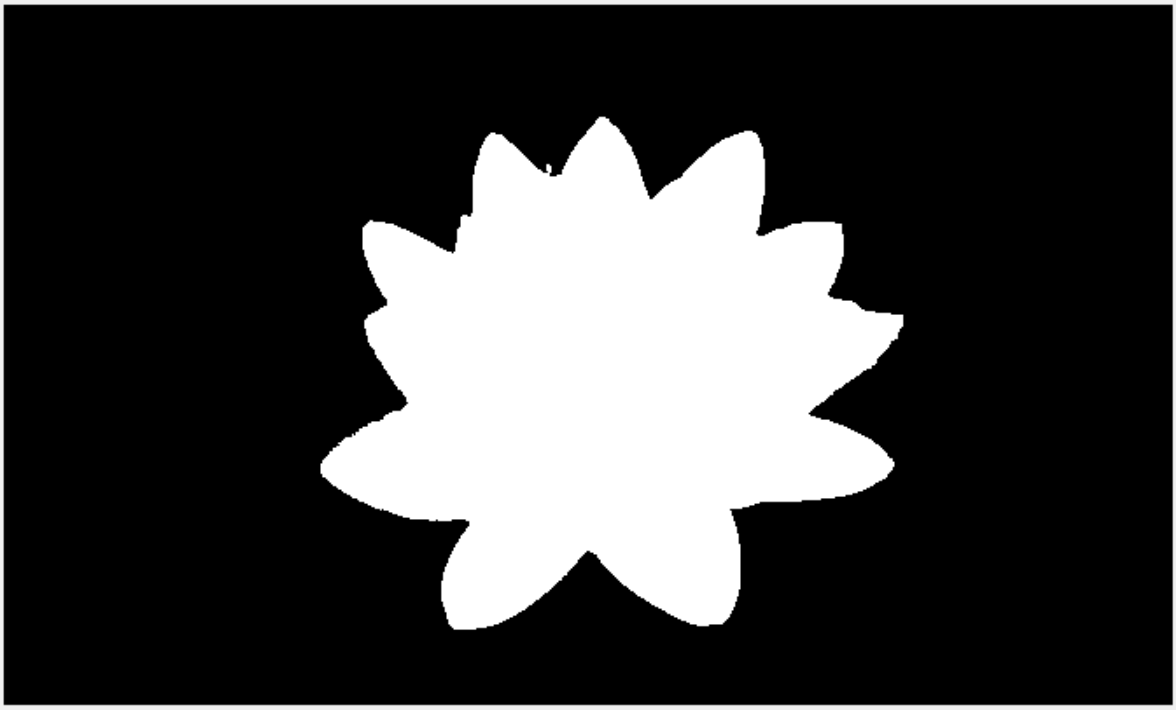


```
G = (imgradient(I));

markers = imimposemin(G,MASK);

WS = watershed(markers);
IB = WS == 0;
RGB = imoverlay(I,IB);
imshow(RGB,[]);
```

```
% segmentació assistida utilitzatnt graph min cut
I = imread("nenufar.jpg");
[SP,N] = superpixels(I,100); % va fent dilatacions fins que el color sigui similar
BW = boundarymask(SP);
imshow(imoverlay(I,BW,'cyan'));

roiPoints = drawpolygon;
```



```
FG = poly2mask(roiPoints.Position(:,1), roiPoints.Position(:,2),size(SP,1),size(SP,2));
BW = grabcut(I,SP,FG); % SP = imatge d'etiquetes
imshow(BW);
```

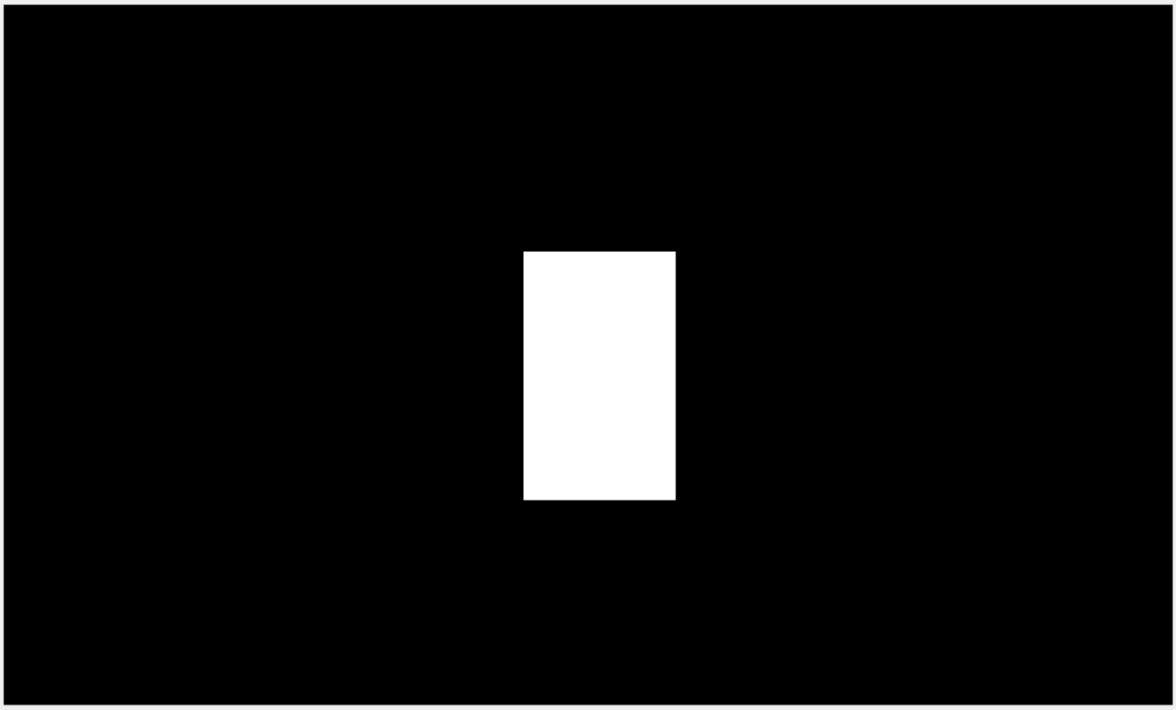


```
% segmentació per color
I = imread('nenufar.jpg');
imshow(I);
```

```
[f,c,p] = size(I);

R = I(:,:,1);
G = I(:,:,2);
B = I(:,:,3);
k = 8;
O = [R(:),G(:),B(:)];
[C, Centroide] = kmeans(double(O),k,'MaxIter',200);
C = reshape(C,[f,c]);
RGB = label2rgb(C);

RGB2 = I;

for i = 1:f
    for j = 1:c
        rgb = Centroide(C(i,j),:);
        RGB2(i,j,1) = uint8(rgb(1));
        RGB2(i,j,2) = uint8(rgb(2));
        RGB2(i,j,3) = uint8(rgb(3));
    end
end
imshow(RGB2);
```

```
I = imread('nenufar.jpg');
imshow(I);
rect = getrect;
```

```
[f,c,p] = size(I);

% remarquem els rectangle
MASK = false([f,c]);
MASK(rect(2):rect(2)+rect(4),rect(1):rect(1)+rect(3)) = 1;
imshow(MASK);
```



```
R = I(:,:,1);
G = I(:,:,2);
B = I(:,:,3);
k = 8;
O = [R(:),G(:),B(:)];

[C,Centroide] = kmeans(double(O),k,'MaxIter',200);
C = reshape(C,[f,c]);

% histograma de fora, histograma de dins, restar i ho tens

h = imhist(uint8(C));
h2 = imhist(uint8(C(rect(2):rect(2)+rect(4),rect(1):rect(1)+rect(3))));

bg = h - h2;
RGB2 =uint8(false([f,c]));
imshow(RGB2);
```

```
for i = 1:f
    for j = 1:c
            rgb = Centroide(C(i,j),:);
            RGB2(i,j,1) = uint8(rgb(1));
            RGB2(i,j,2) = uint8(rgb(2));
            RGB2(i,j,3) = uint8(rgb(3));
    end
end
imshow(RGB2);
```