```
clc;clear all;
a = imread('candle.png')
```

```
a = 597×1383×3 uint8 array
a(:,:,1) =

    35    35    44    39    35    35    35    35    35    35    35    35    35    35    47    35    35    35    35
    35    35   223   178    35    35    35    35    35    35    35    35    35    64   248   126    35    33    32
    35    35   143   113    35    35    35    35    35    35    35    35    35    45   172   104    68    62    70
    35    35    35    59    35    35    35    35    35    35    35    35    48    94   107   111   113   110   114
    35    35    99   251    93    35    35    35    35    35    35    55   100   112   110   113   111   114   110
    35    35    56   162    52    35    35    35    35    35    48    99   114   111   113   110   114   111   113
    35    35    35    35    36   176   121    35    63    44    95   112   110   113   111   114   110   113   111
     ⋮
```

```
imshow(a)
```

```
% r=a(:,:,1);
% b=a(:,:,3);
% g=a(:,:,2);
%
% g=g-r;
% imshow(g)
%
% [R C]=size(r);

% for i=1:R
%     for j =1:C
%
%         if (a(i,j,1)<10 && a(i,j,2)>100 && a(i,j,3)<10)
%             continue;
%         else
%             a(i,j,:)=0;
```

```
%           end
%
%       end
% end
% imshow(a)
```

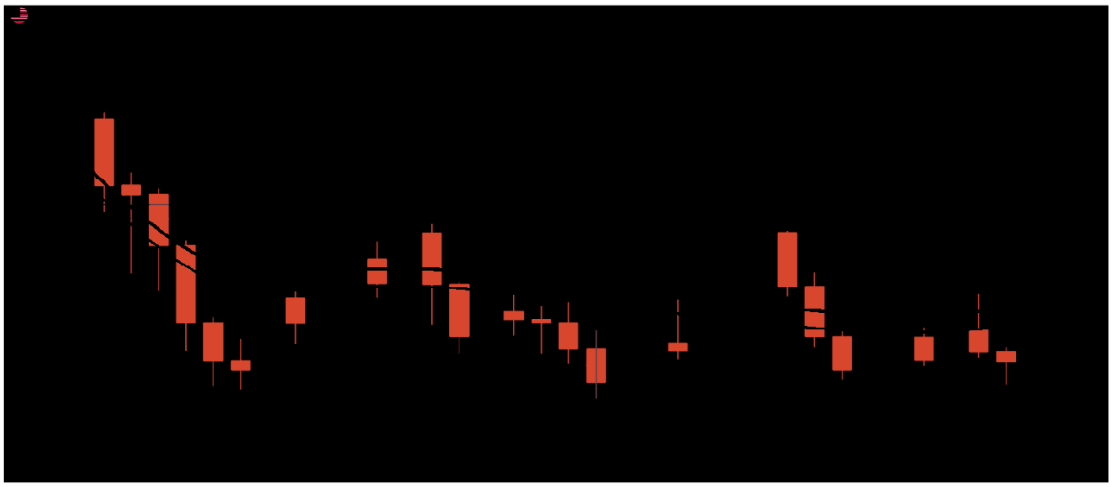
```
[BW MSK]=RedFilter(a)
```

```
BW = 597×1383 logical array
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0⋯
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
     ⋮

MSK = 597×1383×3 uint8 array
MSK(:,:,1) =

     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     ⋮
```

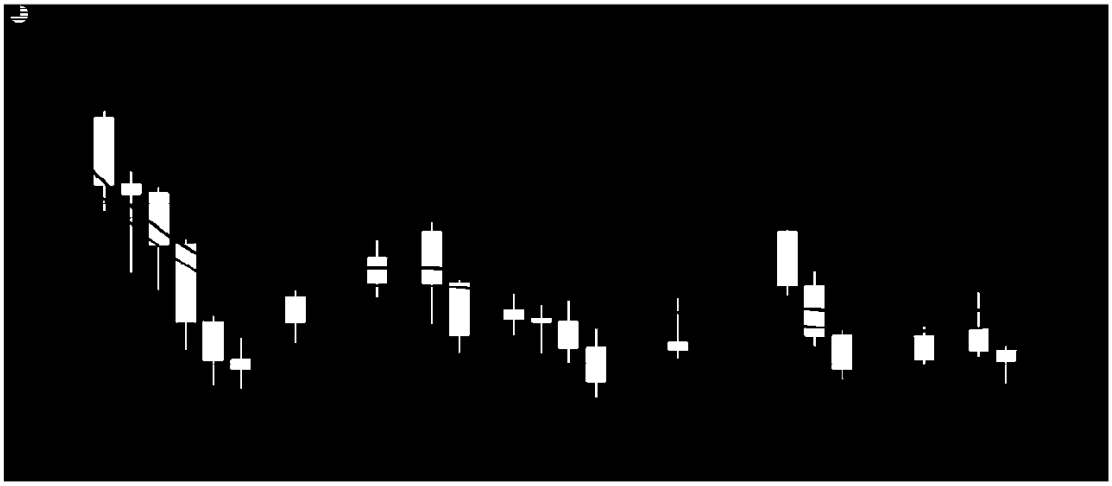
```
rbw = BW
```

```
rbw = 597×1383 logical array
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0⋯
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
     ⋮
```

```
imshow(MSK)
```



```
imshow(BW)
```



```
[BW,maskedImage] = CandleSegmentor(MSK,BW)
```

```
BW = 597×1383 logical array
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 ···
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1
   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1
   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1
```

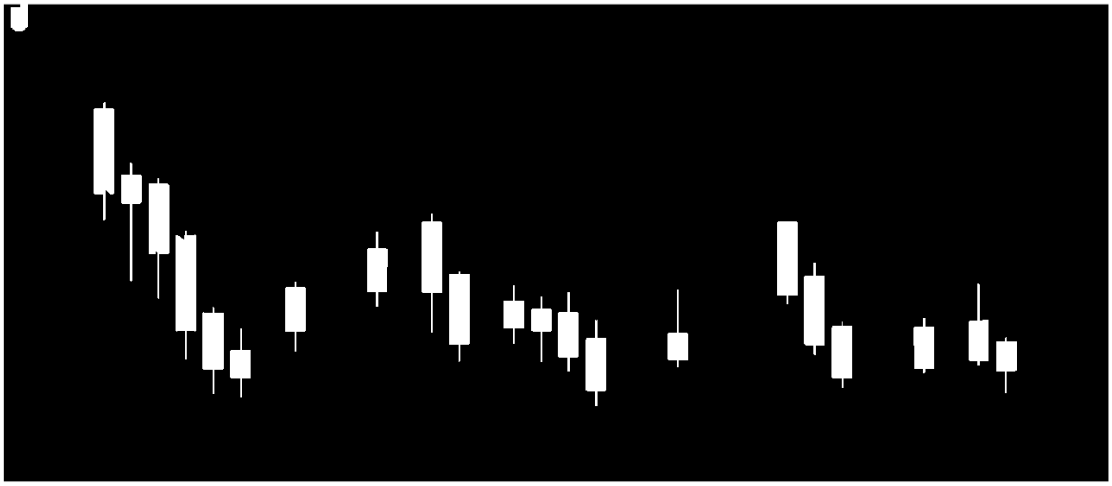
```
   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1
   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1
   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1
     ⋮
```

maskedImage = *597×1383×3 uint8 array*

maskedImage(:,:,1) =

```
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     ⋮
```

```
imshow(BW)
```



```
s = regionprops(BW,'centroid')
```

s = *22×1 struct*

Fields	Centroid
1	[20.2805...
2	[125.490...
3	[160.341...
4	[194.457...
5	[228.537...
6	[262.523...

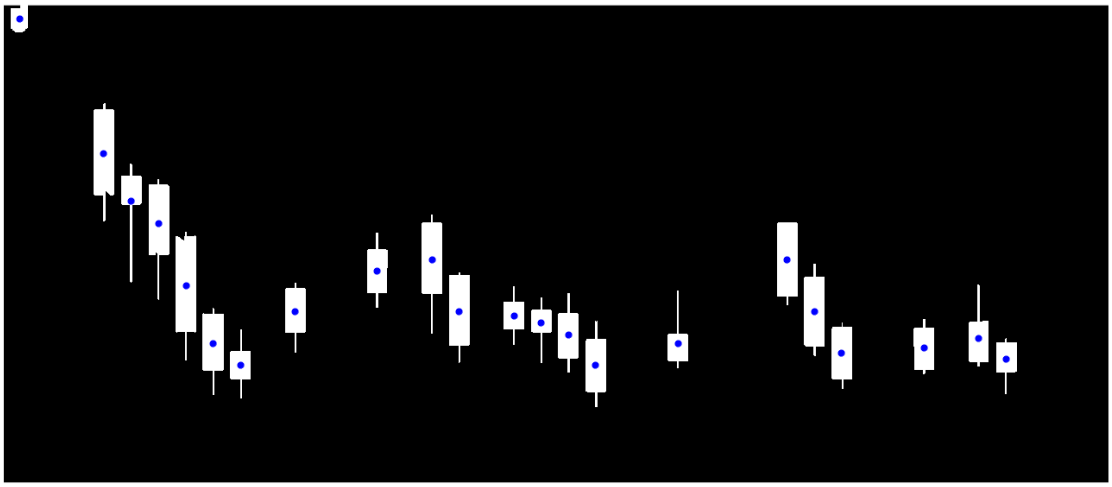
Fields	Centroid
7	[296.644...
8	[365.491...
9	[468.197...
10	[536.505...
11	[570.515...
12	[639.419...
13	[673.513...
14	[707.540...

⋮

```
centroids = cat(1,s.Centroid)
```

```
centroids = 22×2
10^3 ×
    0.0203    0.0178
    0.1255    0.1860
    0.1603    0.2460
    0.1945    0.2734
    0.2285    0.3514
    0.2625    0.4239
    0.2966    0.4504
    0.3655    0.3836
    0.4682    0.3325
    0.5365    0.3195
     ⋮
```

```
imshow(BW)
hold on
plot(centroids(:,1),centroids(:,2),'b*','LineWidth',2)
hold off
```



```
number_of_bal= length(centroids)
```

```
number_of_bal = 22
```