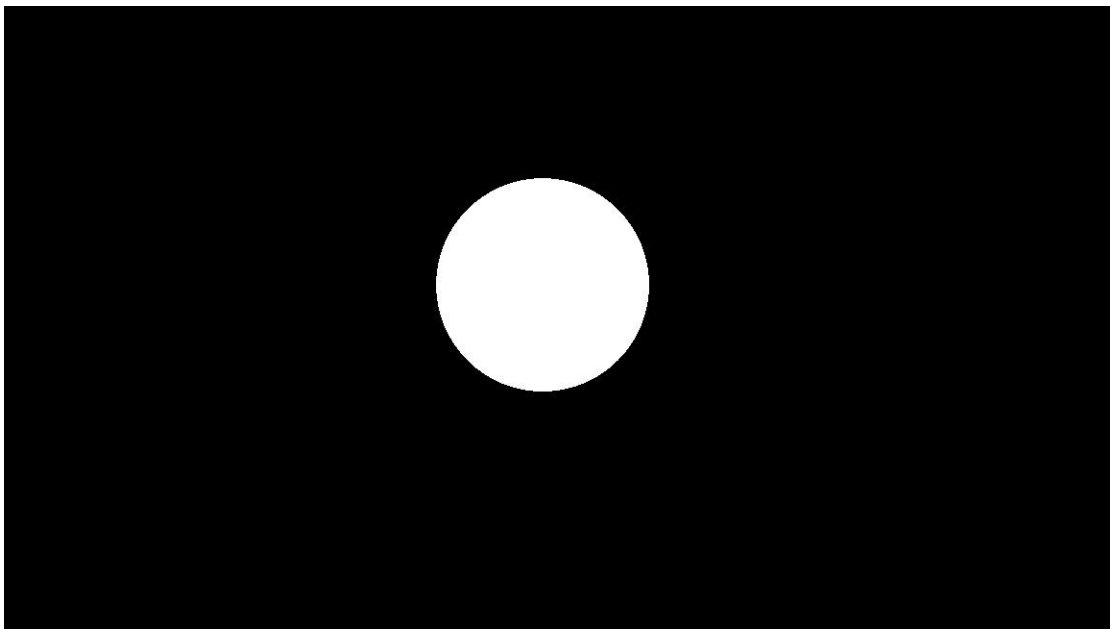
CODE:

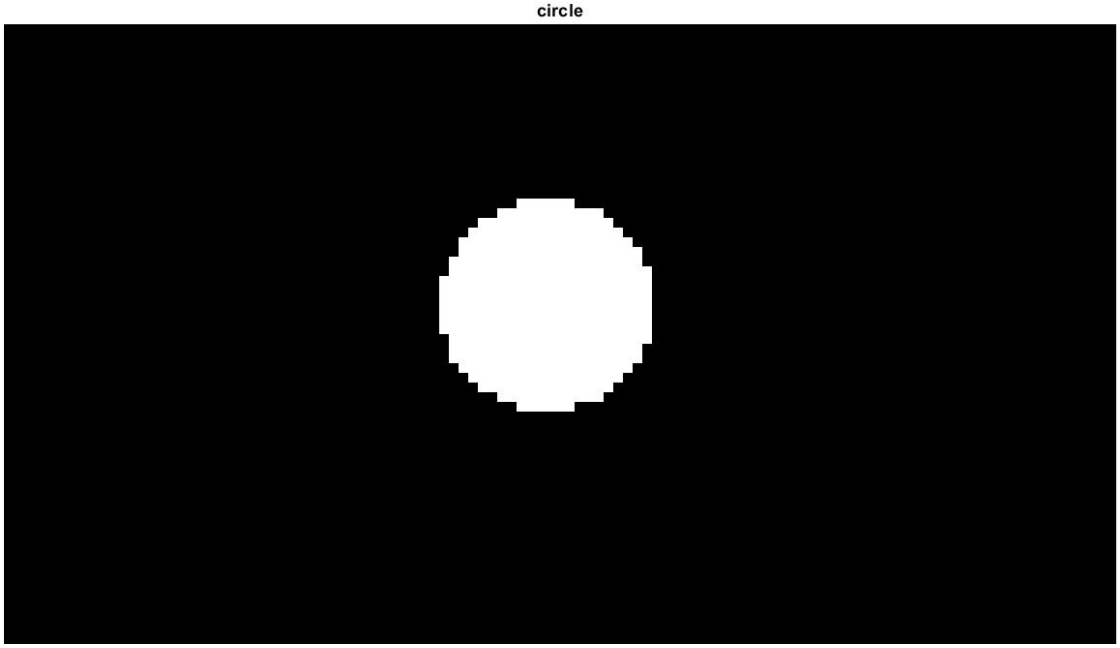
```
clc; close all; clear all;
img = imread('circle.jpg'); % 'circle' image
img = rgb2gray(img);
img= img(1:640,1:1150);
col = length(img(1,:));
rows = length(img(:,1));

%imshow(img)
r = (rows/10);
c = (col/10);

for i = 1:r-1
   for j = 1:c-1
      x = (i-1)*10+1; % for traversing individual grid blocks
      y = (j-1)*10+1;
      count=0;
      for p = x:x+10
         for q = y:y+10
            if img(p,q) == 255
               count = count+1; % part of the grid block that is white
            end
         end
      end
      if count >=50 % using a threshold to make a grid as white or black
         for p = x:x+10
            for q = y:y+10
               img(p,q) = 255; % white
            end
         end
      else
         for p = x:x+10
            for q = y:y+10
               img(p,q) = 0; % black
```

```
            end
        end
    end
end

% finding perimeter and area
bw = edge(img,'Roberts');
perimeter=0;
for i=1:640
    for j =1:1150
        if bw(i,j) == 1
            perimeter = perimeter +1;
        end
    end
end
area =0;
for i=1:64
    for j=1:115
        ix = (i-1)*10+1;
        jx = (j-1)*10+1;
        if img(ix,jx) == 255
            area = area + 100;
        end
    end
end
compactness = (perimeter^2)/area;

A = ['perimeter = ', num2str(perimeter)];
disp(A);
A = ['area = ', num2str(area)];
disp(A);
A = ['compactness = ', num2str(compactness)];
disp(A);

figure(1);
imshow(img);
title('circle');
```

Results and Observations

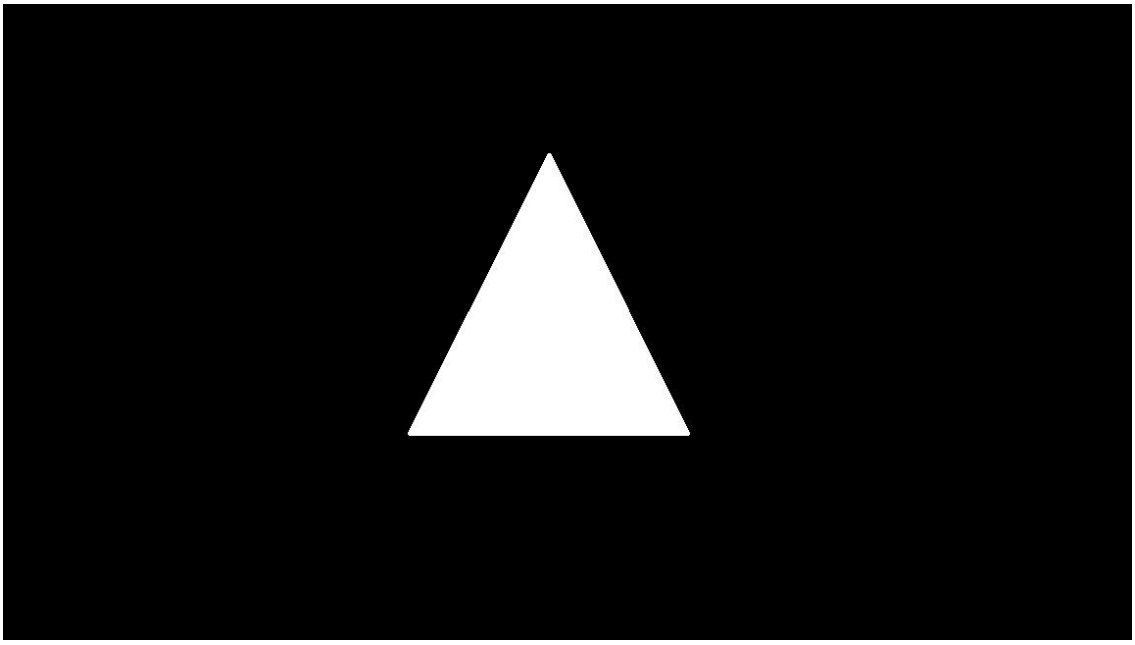
Circle

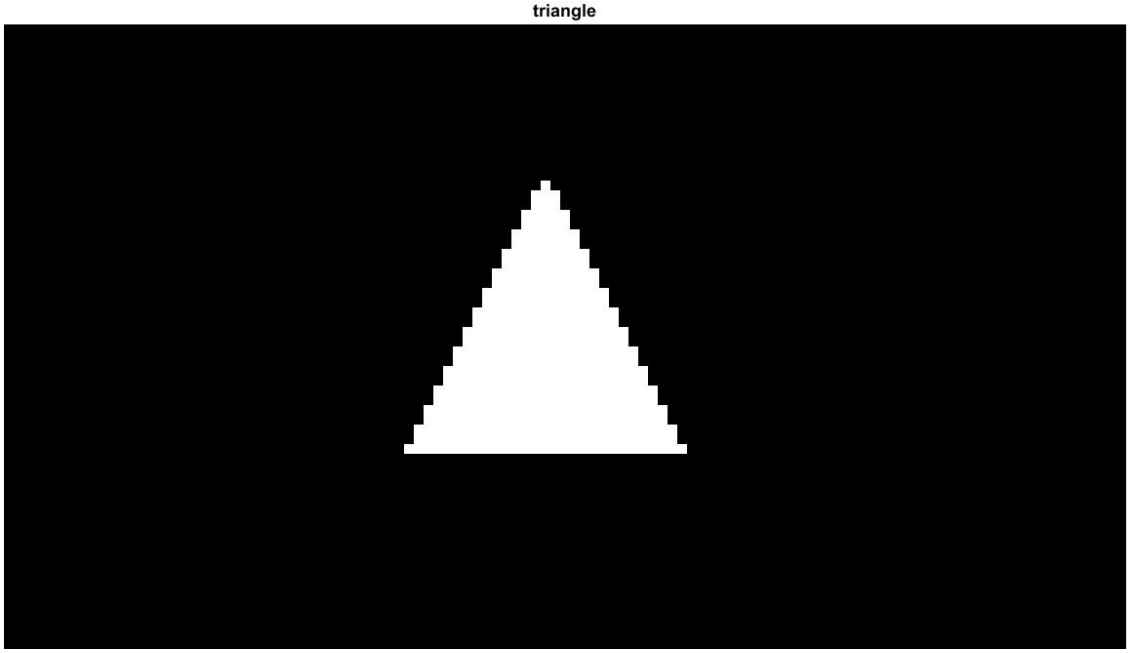




perimeter = 880
area = 38300
compactness = 20.2193

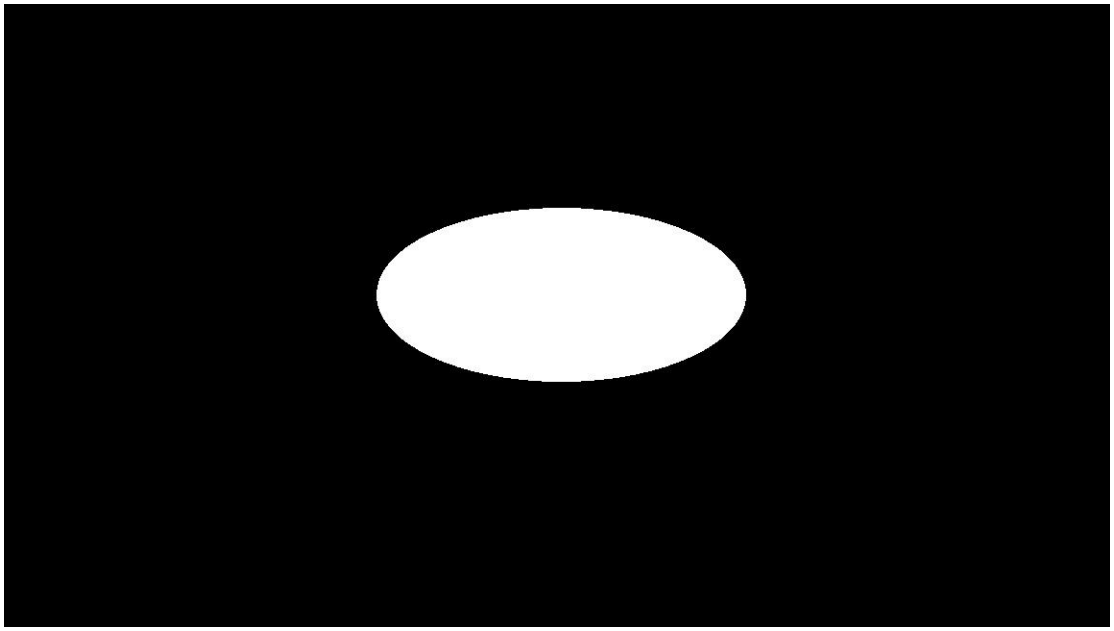
Triangle

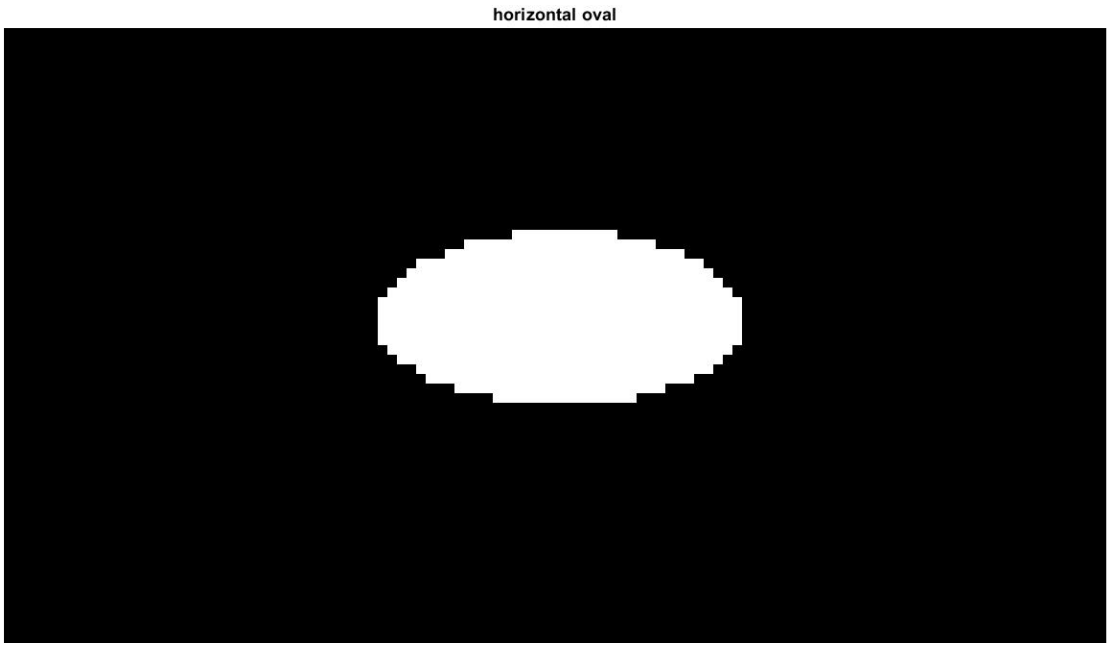




perimeter = 1140
area = 42000
compactness = 30.9429

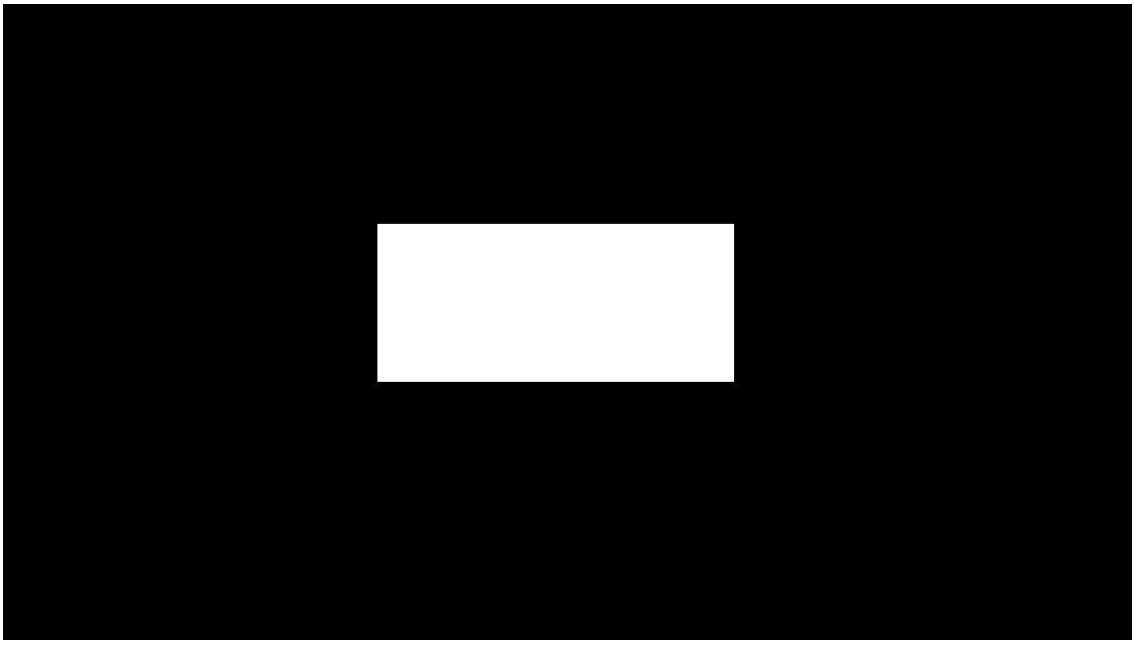
Horizontal Oval

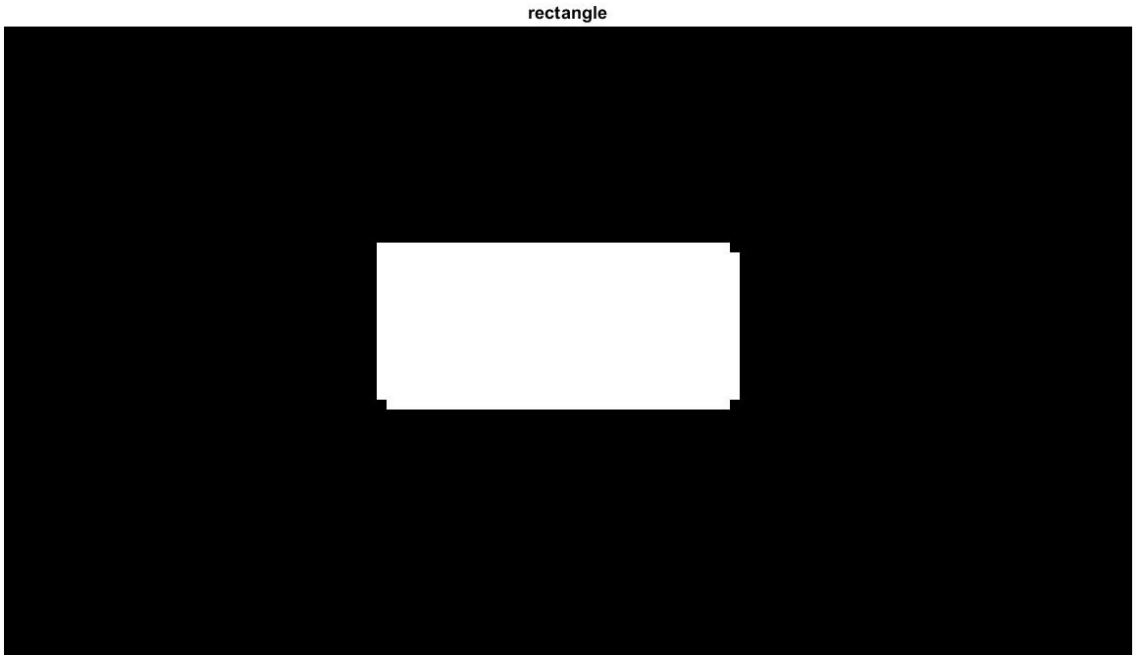




perimeter = 1120
area = 54400
compactness = 23.0588

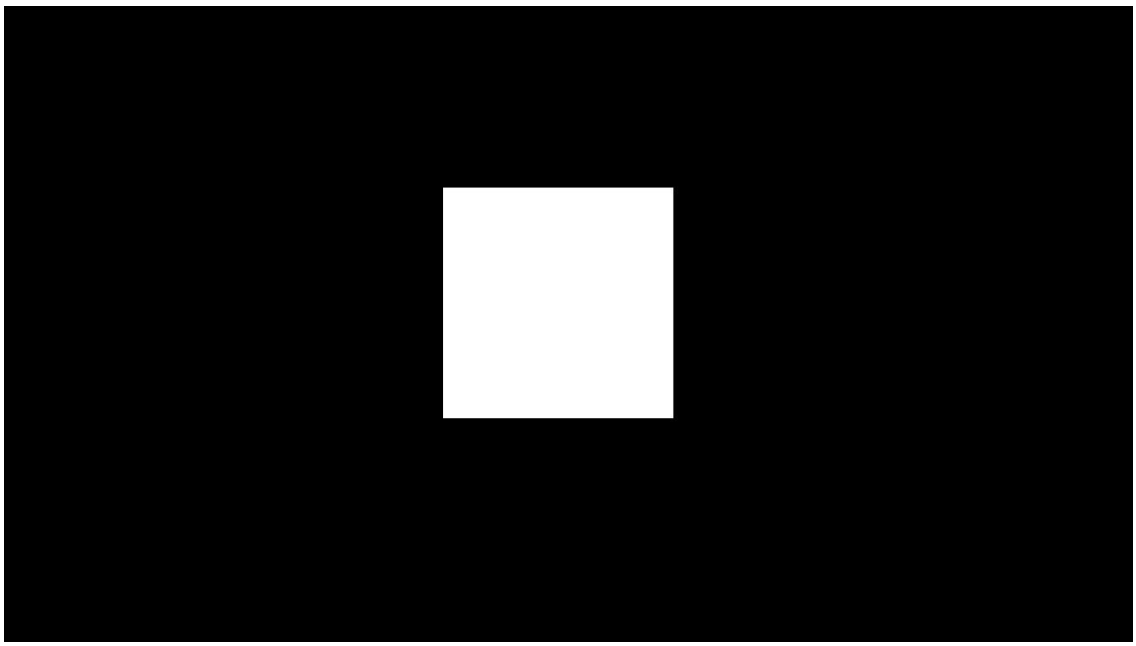
Rectangle

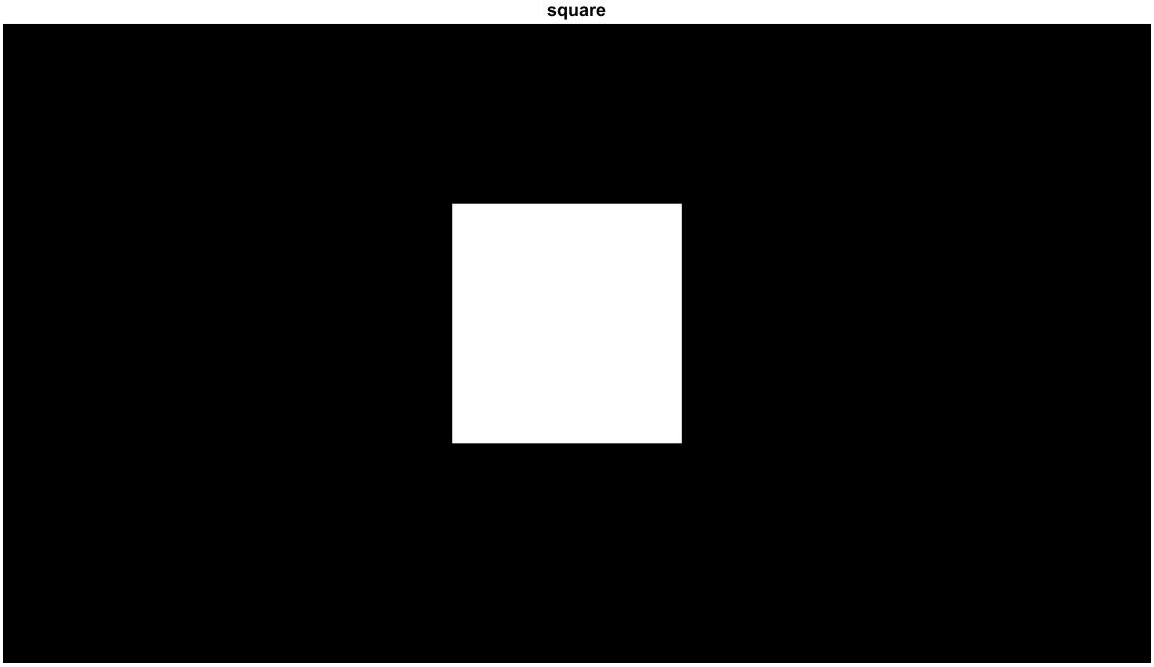




perimeter = 1080
area = 62600
compactness = 18.6326

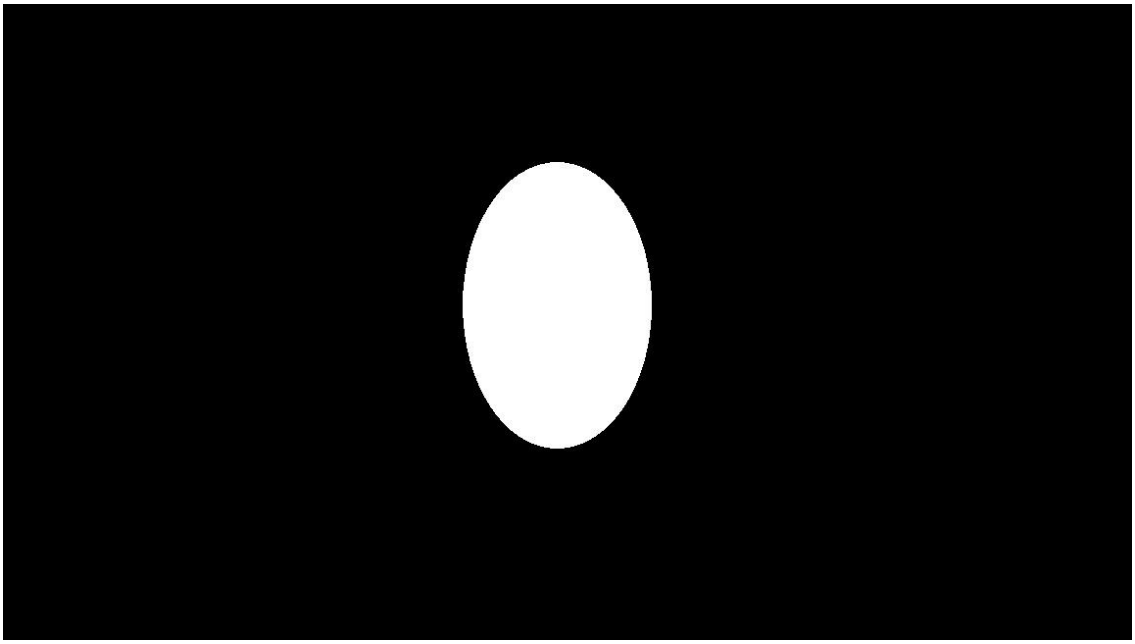
Square

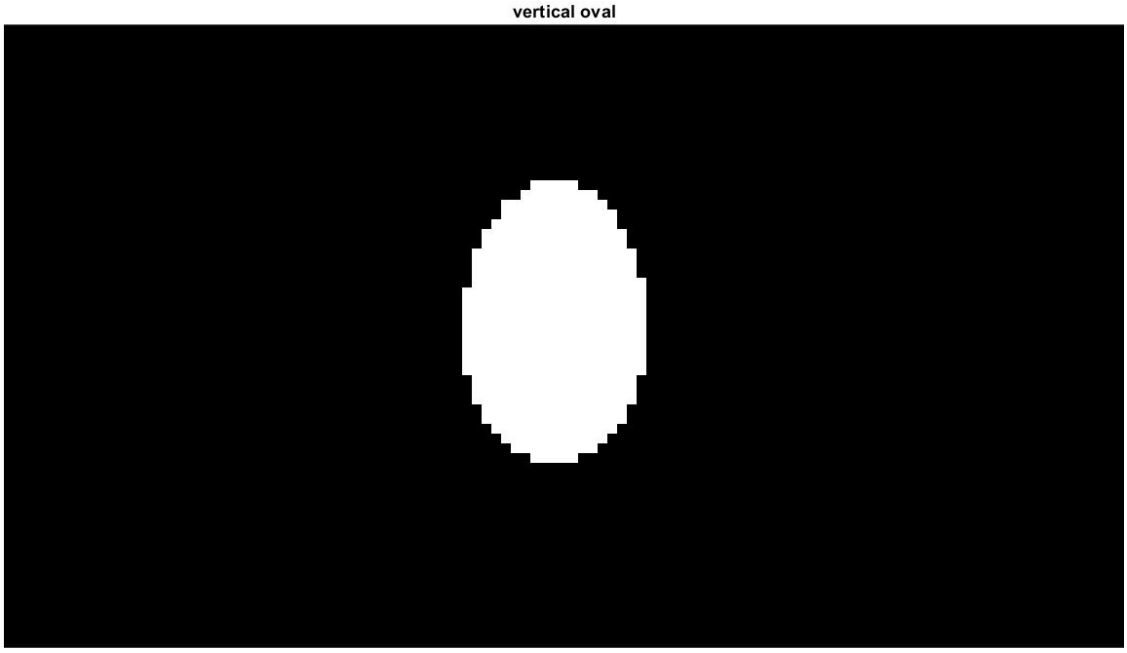




perimeter = 940
area = 55200
compactness = 16.0072

Vertical Oval





perimeter = 960
area = 43800
compactness = 21.0411