

Student name: **Enter your name here**

Homework Assignment 2

Part I

Write a short Matlab code that fills a vector x with $nSteps$ elements starting with $xMin$ and ending with $xMax$. Add your code to these lines (2pts):

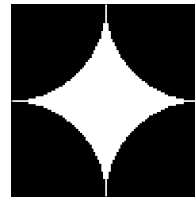
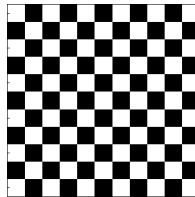
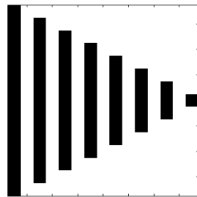
```
xMin = 1.2345;
xMax = 2.3445;
nSteps = 17;
...
```

Part II

In our computer lab, we started from the file containing the following lines (12pts):

```
maxX = 20;
maxY = 20;
A=zeros(maxX,maxY);
A(1,:) = 1
A(:,2) = 1
A(4,4) = 1
%The following line display contents of the matrix. The details are not important.
imagesc(A');
set(gca,'YDir','normal');
colormap(1-gray);
axis tight;
```

Modify this file in order reproduce the following three images. For the last image, change the number of pixels to 51×51 .



For each image,

- Please cut and paste the Matlab code into your HW document.
- Export all your images as PNG files and insert them into this homework document here:

Part III

We want to extend our calculations of the ocean volume and surface fraction from the lab. Please check that you have a working code that yields a volume of $1.3 \times 10^{18} \text{ m}^3$ and ocean surface fraction of 70.9%. If not please check with a fellow student or come to our office hours before working on the following assignment. Use the data set with 180×360 grid points throughout. (15pts).

- Let us assume a giant meteorite hit the Earth and a lot of water is lost to space. Long after impact, the oceans settle to a level that is 1700 meters lower than before. Please compute the new volume of the oceans and determine by how many percent it decreased.

(2) Imagine the water level would magically increase by 600 meters compared to today's level. Determine how many percent of the new world's surface would be covered with oceans.

(3) Finally determine the change in sea level that would cause a 15% increase in ocean volume. You may want to run your code multiple times for different sea levels. A precision for the sea level change of ± 2 meter is sufficient.