**Exercise #6**

Tutor in charge of this HW: Michal Tamir

**HW instructions:**

* Don't forget to write both names in the header (as a comment).
* **You should submit 2 file in this HW: \*.m file & \*.mat file.**

Both files should have the same name “HW6\_ID1\_ID2” (“HW6\_12345678\_87654321” for example).

* Before each question X.Y write the line: “%% Question X.Y”. Below there's an example of how the \*.m file should look like.

% HW6

% Avi Bitter XXX

% Eliko YYY

%% question 1.1

matlab code….

%% question 1.2

matlab code….

In this exercise, you will be measuring and re-plotting data from a published graph.

**Question 1**

1. Load the .jpg file - image Kjelstrup\_et\_al\_Science\_2008.jpg into matlab, using imread(), and plot it using imshow().
2. Use ginput() to measure the locations of the twelve points in the graph (4 points per category).
3. Measure also a set of calibration points on the x-axis and y-axis so that you'll be able to translate the pixel values you got in (2) to the same axis values you see in the image.
4. Save the two sets of points from (2) and (3), i.e. data points and calibration points, in a file called ‘ex6\_your\_id.mat’.

**Question 2**

The next steps should use the two sets of points you saved above, so that your HW checker won’t have to use ginput() in every re-run of the script. We will need the exact x, y of the points you measured to check the exercise. Make sure to divide your code in sections such that the HW checker can skip the ginput part, and go directly to load the saved data. You advised to use an if statement with a flag (variable) that indicate whether to use ginput or to load the saved data.

1. Load the mat file you save in the previous part.
2. Open a new figure and by using the axes() function create two subplots – the first one should be small and display the original image (use imshow() ).
3. The second axes you create should be horizontally double and vertically the same size - Plot on it the data you extracted from the original figure. Make sure to plot the three categories with different symbols as in the original figure. (You can place the two subplots however you choose in the figure, as long as you make sure the second one is twice as big as the first).
4. Find the linear regression (you can use the ‘fitlm’ function), using all the 12 datapoints, and plot it with a dashed line style. Next, using the regression line you found, predict the data at 40% on the x axis and plot this with a distinct new symbol. Add the text “prediction” to the left of this point.
5. Annotate the graph: Put a title, an x-label, a y-label and a legend (according to the three categories and the linear regression).
6. Set the xticks and yticks as they are in the original figure.
7. Save the figure in jpeg format – call it ‘ex6\_figure\_your\_id\_number.jpg’