To start:

1. Understand the project target,
   1. Based on the literature, draft the first version of your approach.

<http://www.ijetch.org/papers/292-JT379.pdf>

* 1. Data introduction.

<https://www.dropbox.com/sh/hbyppi0tnvc04ku/AAALcrNgX9L96N0lC-6KPgORa?dl=0>

1. Go through the following documentation to get familiar with using Matlab
   1. <https://ocw.mit.edu/resources/res-18-002-introduction-to-matlab-spring-2008/lecture-notes/>
   2. <https://eclass.teicrete.gr/modules/document/file.php/TM152/Books/Matlab-Image_Processing_Tutorial.pdf>
   3. Book: Digital Image Processing with Matlab.
2. Understand the features we are looking for
   1. SIZE – length and width in tenths of millimeters. One pair of measurements **per seed**. Parameters to be used for identification are length (i.e. overall size) and ratio of length to width (i.e. shape, aspect ratio).
   2. COLOR – numeric value from C-G, where C is lightest and G is darkest. (A would be pure white and I black.) Also a redness parameter from 3-7, where the highest value is most red. 1 would not be red at all, and 9 pure red. A test grid of samples is used to select values. Record one representative value **per sample** from optical picture, not a value for each seed.
   3. ANGULARITY – numerical value from 1-9 where 1 is the least angular (i.e. spherical, ovoid, etc.) and 9 is the most angular. Using optical images, look at the degree of angularity (sharpness) of the corners and edges. A comparison strip of representative samples for each value is used to assign values. One measurement **per sample**.
   4. SEED TEXTURE (RELIEF) – Using either optical images or SEM images of single seeds, record overall texture as a numeric value from 1-9, where 1 = smooth, 2 = barely discernable, 9 = cell structure is higher than the width of each cell. Note that samples with 1 or 2 values may not exist. Comparison strips of representative samples for each value are used to assign values. One measurement **per sample**.
   5. WINGS – record presence or absence of surface extension as a value of 1-4 where 1 = no, 2 = probably no, 3 = probably yes, 4 = yes. One measurement **per sample**, create a comparison strip.