As a part of the recruitment process for Computer Vision System Engineer, we will like you to answer these two questions. The idea behind these questions is to understand your perception of various Computer Vision techniques and problem solving approaches. The solution should be in Python.

* Here are a set of [Soybean images](https://drive.google.com/drive/folders/1G9nSbLsF93_qsQb4la8cCWYDV5_fASCC?usp=sharing). Some of the grains develop one particular disease which causes it to develop Purple patch. Find out a way to distinguish whether the grain has purple patches or not, preferably using Image Processing as we don’t have adequate data to train a Deep Learning model. Ensure that it should not detect other grains in it.
* Write a new **adaptive threshold** algorithm which will perform a Gaussian blur based thresholding on only those pixels which are non zero in nature and have intensity less than 80 in the Red Channel. You can use [these images](https://drive.google.com/drive/folders/14L3RKradnpq4vkBiBmIXWD0NhfIv3sLu?usp=sharing). The idea is to remove the black shadow in the background using this method. You can either choose to have a static constant for the adaptive threshold or design a dynamic value for the constant.

Note: Only use Red channel for thresholding and output should be 3 channel image.



These two questions should take you somewhere between 3 to 5 hours. We will like to have your thought process behind the solution.

Thanks for your time!