

## KMeans Clustering

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The following shows the results for `car.png`



Figure 1: Known Initialization



Figure 2: Minimum of Random Initialization



Figure 3: Maximum of Random Initialization

### 1 Implementation Details

- As given the assignment the the centers for known initialization are taken as the **rgb** colors for **RED**, **WHITE** and **BLACK**
- The random initialization method is repeated for 30 times as asked in the assignment
- The number of iterations the KMeans algorithm ran is 5 in every instances

The following shows the results for `flower.png`



Figure 4: Known Initialization



Figure 5: Minimum of Random Initialization



Figure 6: Maximum of Random Initialization

## 2 Observations

- In the case of `car.png`, the known init gave the best results and we can see why because of the colors of initial clusters taken. The minimum of 30 rand init iterations didn't quite get to the level of known init but it was comparatively better than that of the maximum.
- In the case of `flower.png`, since there is not much color profile in the original picture itself, the minimum of the rand init is no different from the known init but as for as the maximum is considered it's not good but it managed to pick apart the foreground from the background.