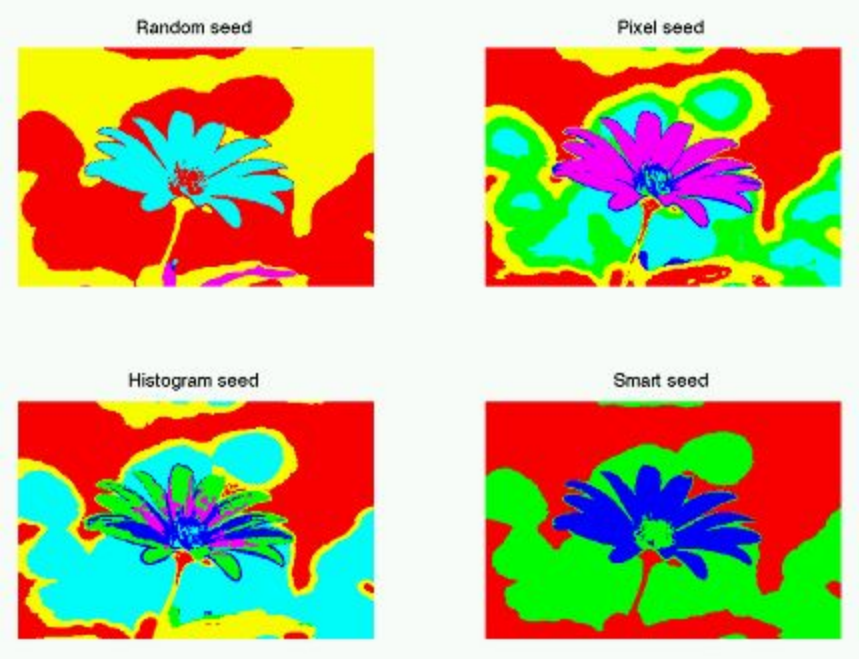
HW3: Color Clustering for Scene Segmentation



Color Clustering

1. K-means algorithm in RGB space
    1. first with randomly selected means
    2. next by sampling seeds from the image
    3. next by selecting seeds from the color histogram (look for peaks)

2. Smarter Version: design a method to find the best K (and then use that value)

3. Test each variant on the following scenes:
   s03, s06, s08, s09, s12.

Images on which to report results

Turn In
(by 11:59pm October 23)

1. your code, as before, well commented, so that the grader can compile them to working binaries.

2. your report

Report

1. Introduction

2. Basic K-Means

2.1 Classical Algorithm with Random Seeds
2.1.1 Algorithm (just how did you pick the random seeds)
2.1.2 Tests and Results (include instruction on how to run program)

2.2 Selecting the Seeds by Sampling
2.2.1 Algorithm
2.2.2 Tests and Results (include instruction on how to run program)

2.3 Selecting the Seeds Using the Histogram of the Image
2.3.1 Algorithm
2.3.2 Tests and Results (include instruction on how to run program)

3. Smart K-Means
3.1 Algorithm for Determining K
3.2 Tests and Results (include instruction on how to run program)

Evaluation

- Working k-means Program: 4 points
  - Classical algorithm with random seeds (2 point)
  - Selecting seeds by sampling (1 point)
  - Selecting seeds using the histogram of the image (1 point)
- Working smarter k-means algorithm: 3 points
- Quality of the code (code structure, comments and documentation): 2 points
- Report: 3 points
- Quality of the results: 3 points