KUTAISI INTERNATIONAL UNIVERSITY

Numerical Programming

Ramaz Botchorishvili

Kutaisi International University

AP#1

Norms and clustering 1

Problem 1.1

Modeling with

- k-means clustering (for students minoring in MGMT)
- k-medoids clustering (for everyone)
- DBSCAN clustering (for students minoring in Math)

Norms and clustering, 2

Tasks:

1. Develop code for the assigned two clustering algorithms.
2. Develop tests with synthetic data:
   - 2.1 both assigned methods are accurate for a selected dataset
   - 2.2 one method is better than another for a selected dataset
   - 2.3 clearly state criteria for comparing the methods
   - 2.4 consider both, matrix and vector norms
3. Explanations of tests and conclusions should be provided in writing.
4. Find real world applications of clustering algorithms, formulate the problem including input data and suitable matrix or vector norm(s), perform numerical experiments on toy examples.
5. The real-world applications, numerical experiments, and conclusions should be explained in written form.

Norms and clustering 3

Important Notice

- Test your code, it should work properly for
  - data
  - vector norms
  - matrix norms

  assigned by SA or instructor.
- AP assigned 0 points if:
  - a model problem provided twice by students. Make sure, your model is different from models provided by others.
  - submitted results are not reproducible
  - student cannot apply his own code for data or norms provided by TA or instructor