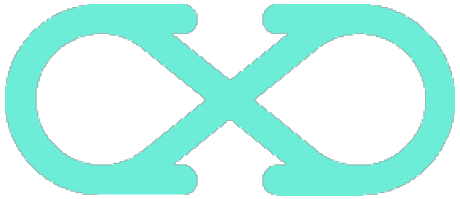

Analyzing Weather Data with Python

Greg Filla, Associate Offering Manager
Data Science Experience

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About me

- Working at IBM for ~2 years - Product Management, Analytics
- Started career as analyst…started coding
- I Like Python - Pandas, Sklearn, Jupyter, Flask, PySpark, etc.

- Twitter: @gdfilla
- Github: https://github.com/gfilla

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Introducing the Data Science Experience

Learn

Built-in learning to get started or go the distance with advanced tutorials

Create

The best of open source and IBM value-add to create state-of-the-art data products

Collaborate

Community and social features that provide meaningful collaboration

http://datascience.ibm.com

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Core Attributes of the Data Science Experience

IBM Data Science Experience

Community

- Find tutorials and datasets
- Connect with Data Scientists
- Ask questions
- Read articles and papers
- Fork and share projects

Open Source

- Code in Scala/Python/R
- Jupyter Notebooks
- RStudio IDE and Shiny apps
- Apache Spark
- Your favorite libraries

IBM Added Value

- Data Shaping/Pipeline UI *
- Auto-data preparation and modeling*
- Advanced Visualizations*
- Model management and deployment*
- Documented Model APIs*
- Spark as a Service

Powered by Watson Data Platform

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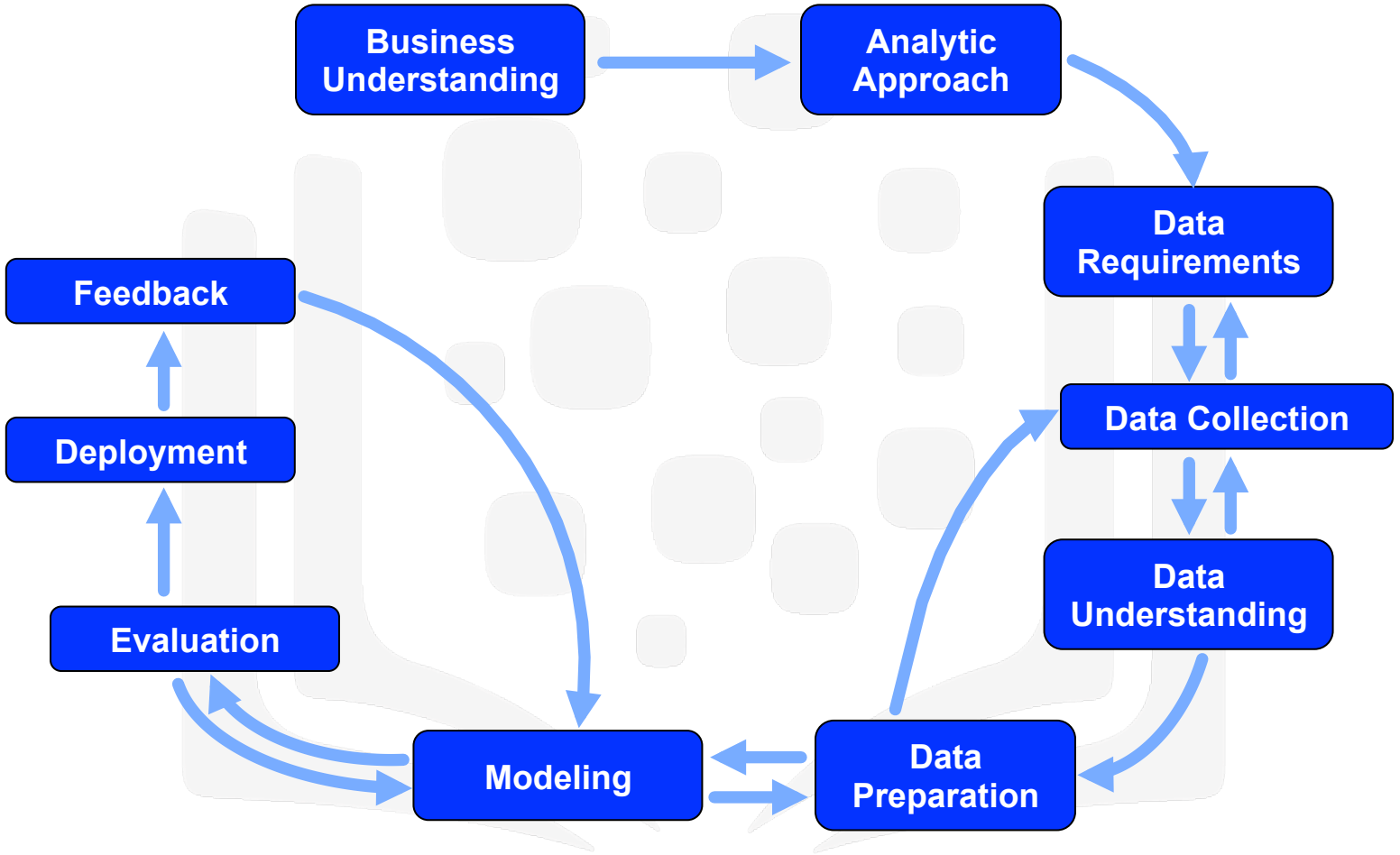
* DSX product roadmap items

Data Science Methodology Diagram



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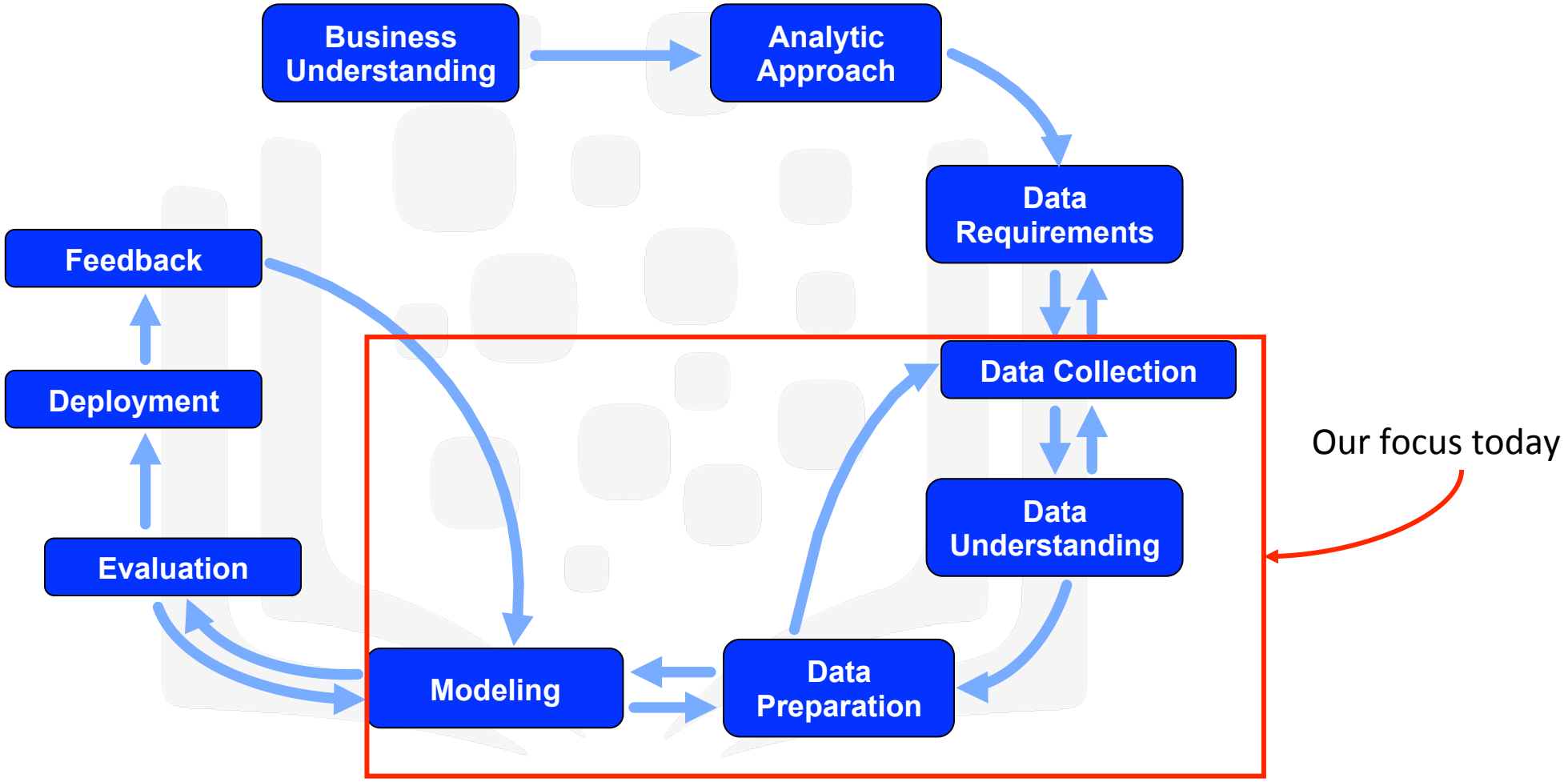
Data Science Methodology Diagram



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Machine Learning

Supervised vs. Unsupervised

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Toolbelt of the Data Scientist

- Linear regression (S)
- Logistic regression (S)
- Decision Trees (S)
- **Clustering (U)**
- Principal component analysis (U)
- Text analysis (S/U)
- SVM/SVR (S)
- Neural networks (S/U)
- Recommender Systems (S)

S == Supervised Learning Technique
U == Unsupersved Learning Technique
S/U == Can be combination of both

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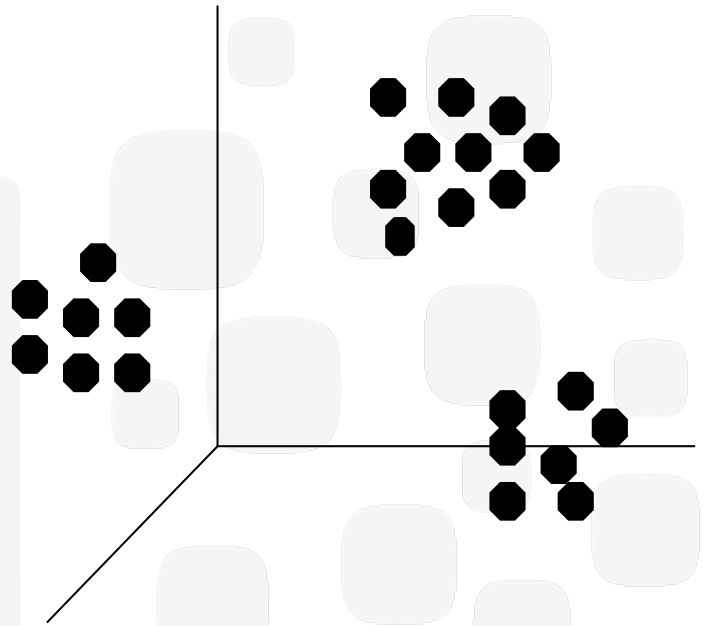
Which weather stations are similar to each other based on weather observations?



Group similar stations together into ***k*** number of clusters.

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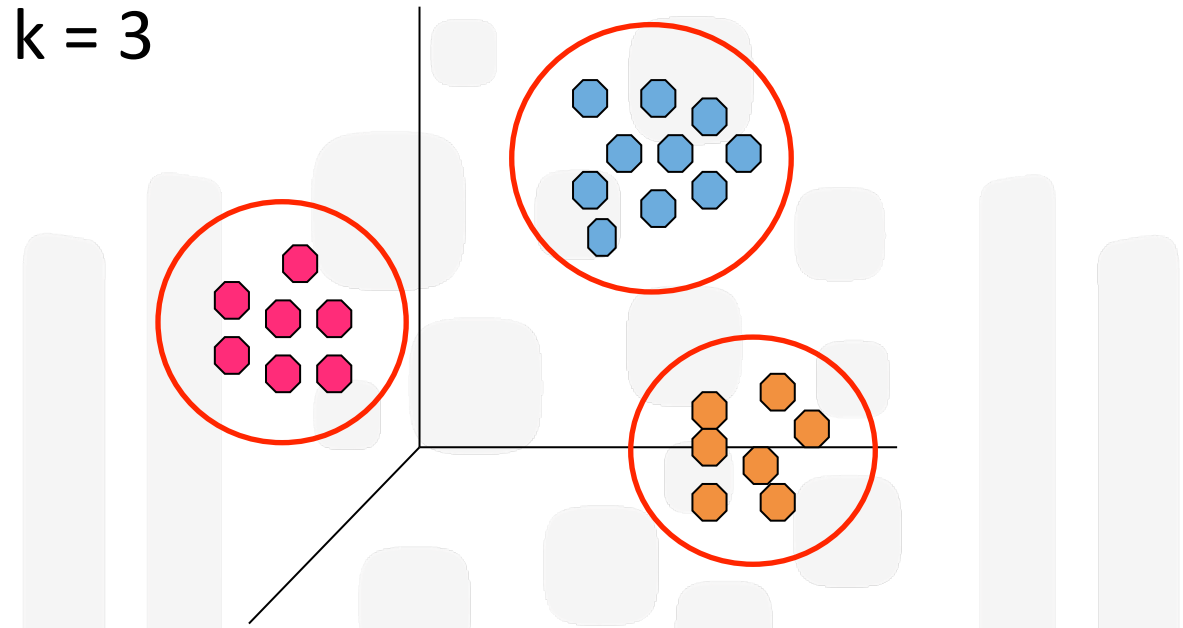
Which weather stations are similar to each other based on weather observations?

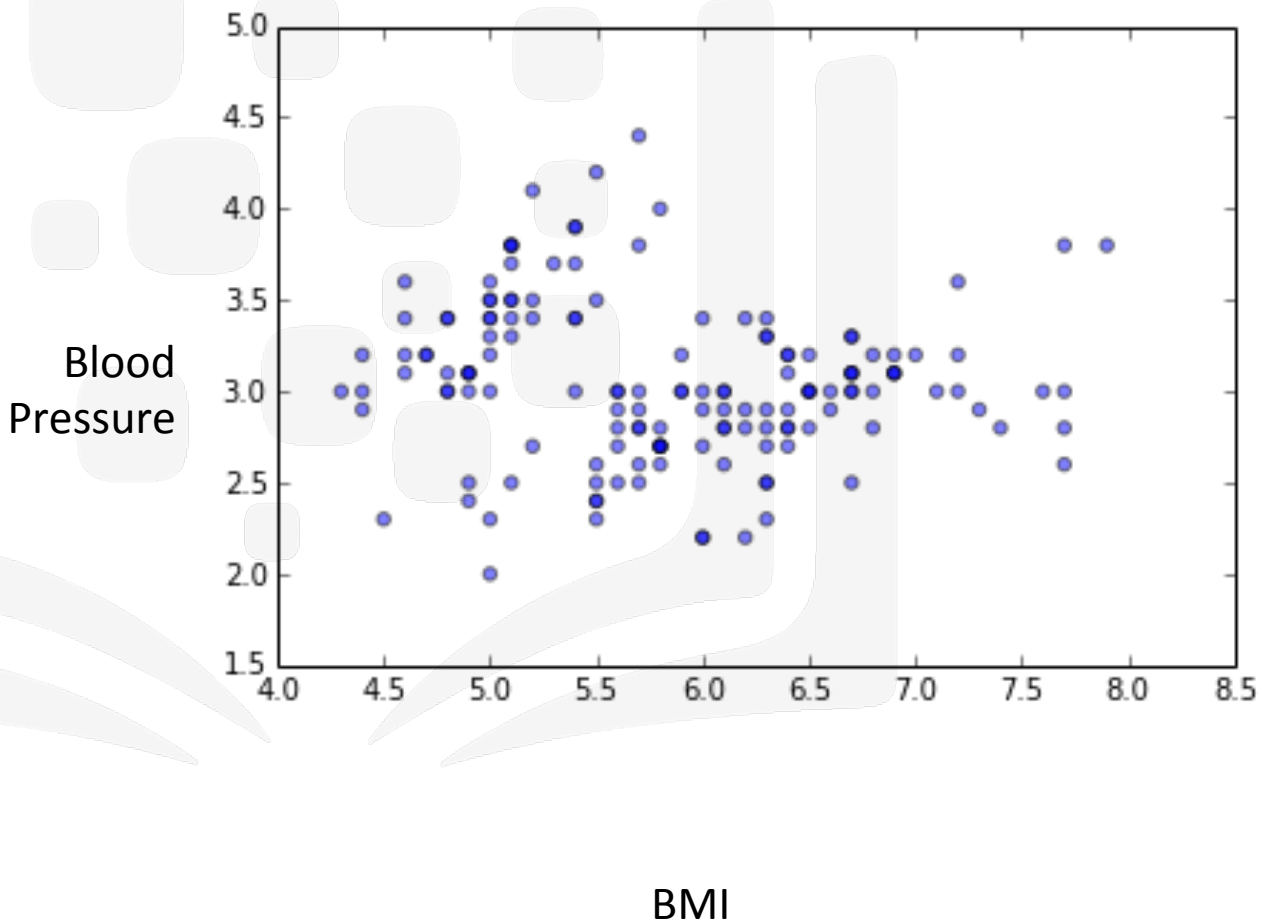


Group similar stations together into ***k*** number of clusters.

K-means Clustering

1) Load your data

	A	B
1	weight	BP
2	5.1	3.5
3	4.9	3
4	4.7	3.2
5	4.6	3.1
6	5	3.6
7	5.4	3.9
8	4.6	3.4
9	5	3.4
10	4.4	2.9
11	4.9	3.1
12	5.4	3.7
13	4.8	3.4



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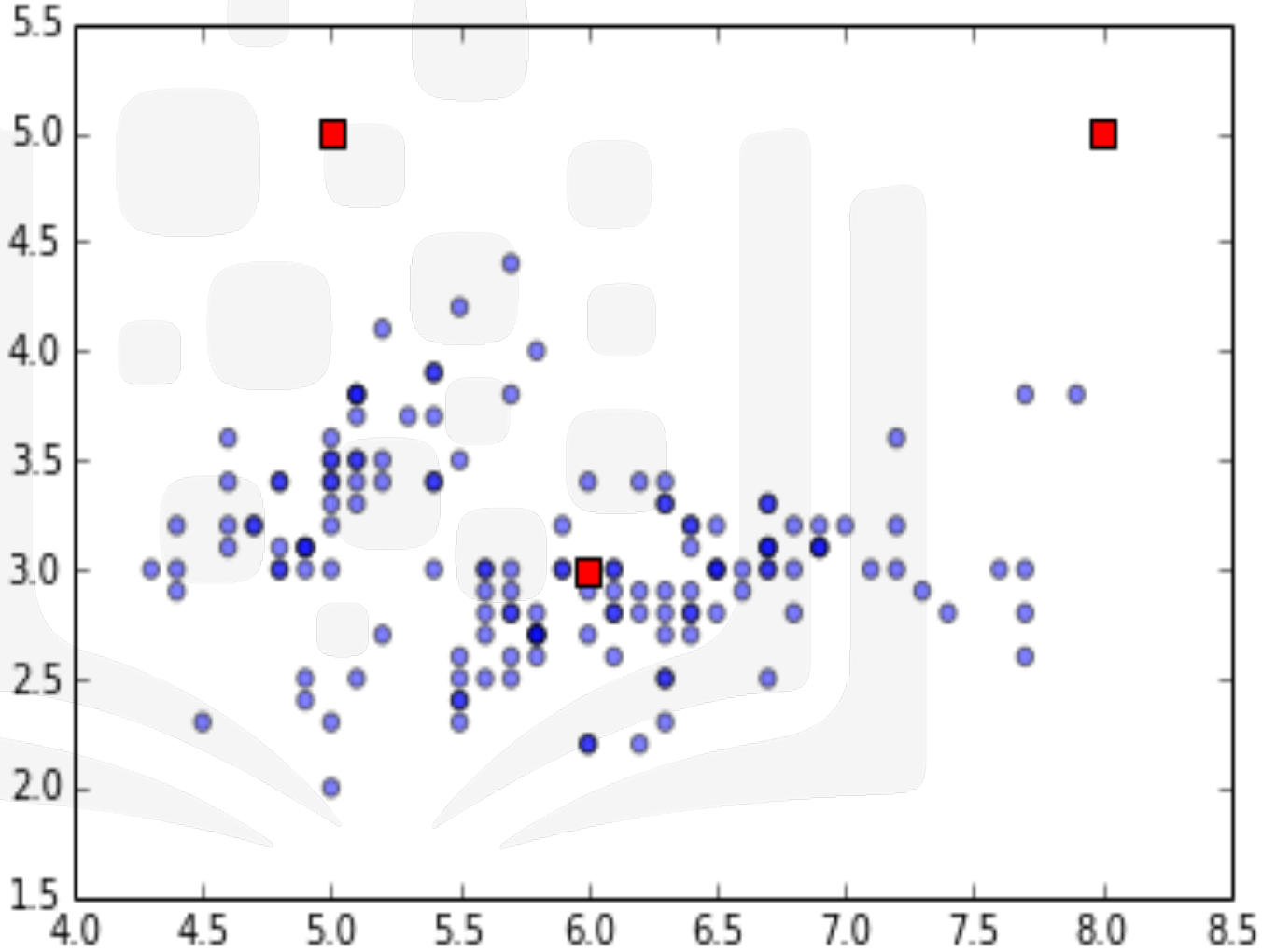
K-means Clustering

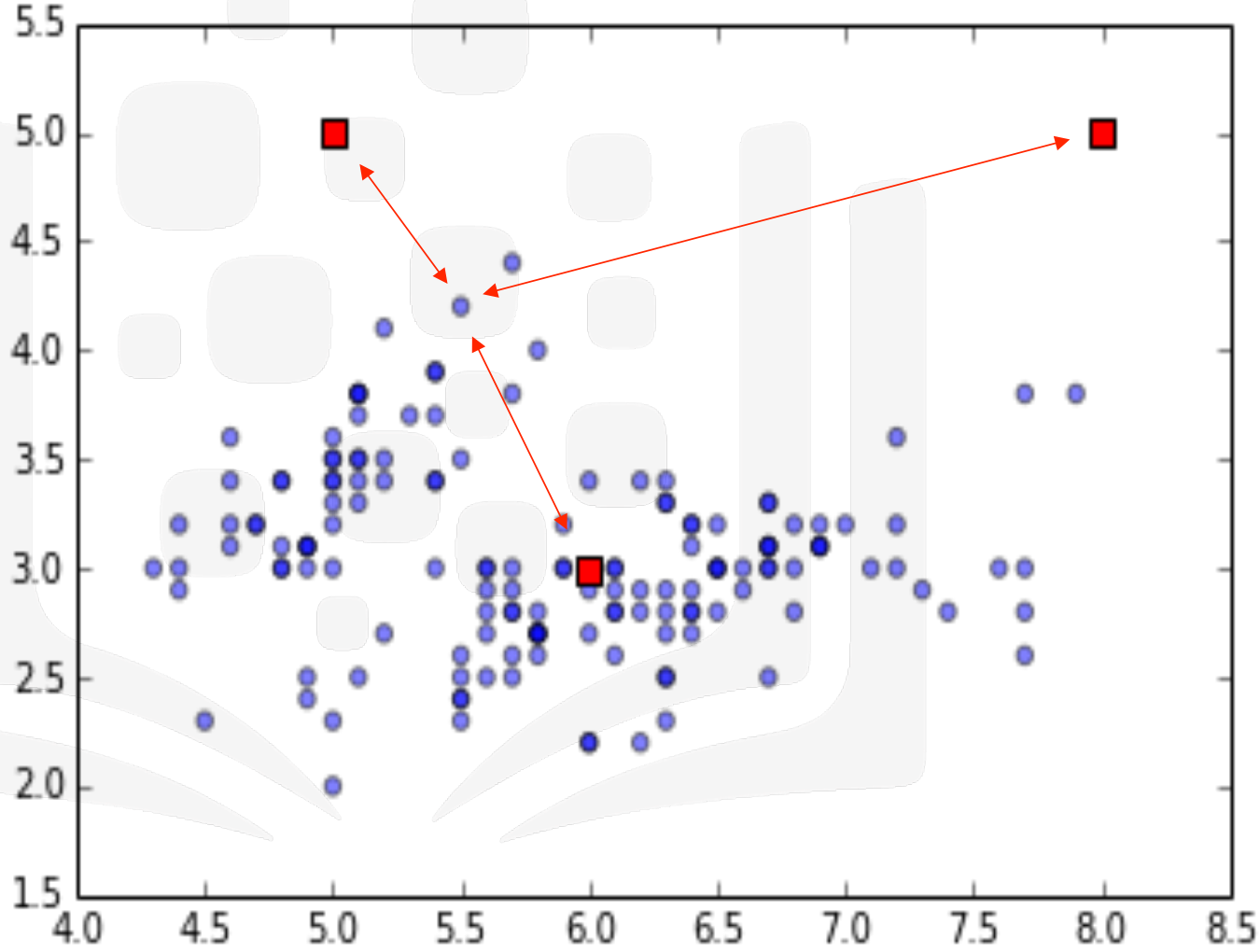
2) Initialize k=3 centroids randomly

[[8., 5.],
[5., 5.],
[6., 3.]]



K-means Clustering

3) Calculate distance of all points from centroids



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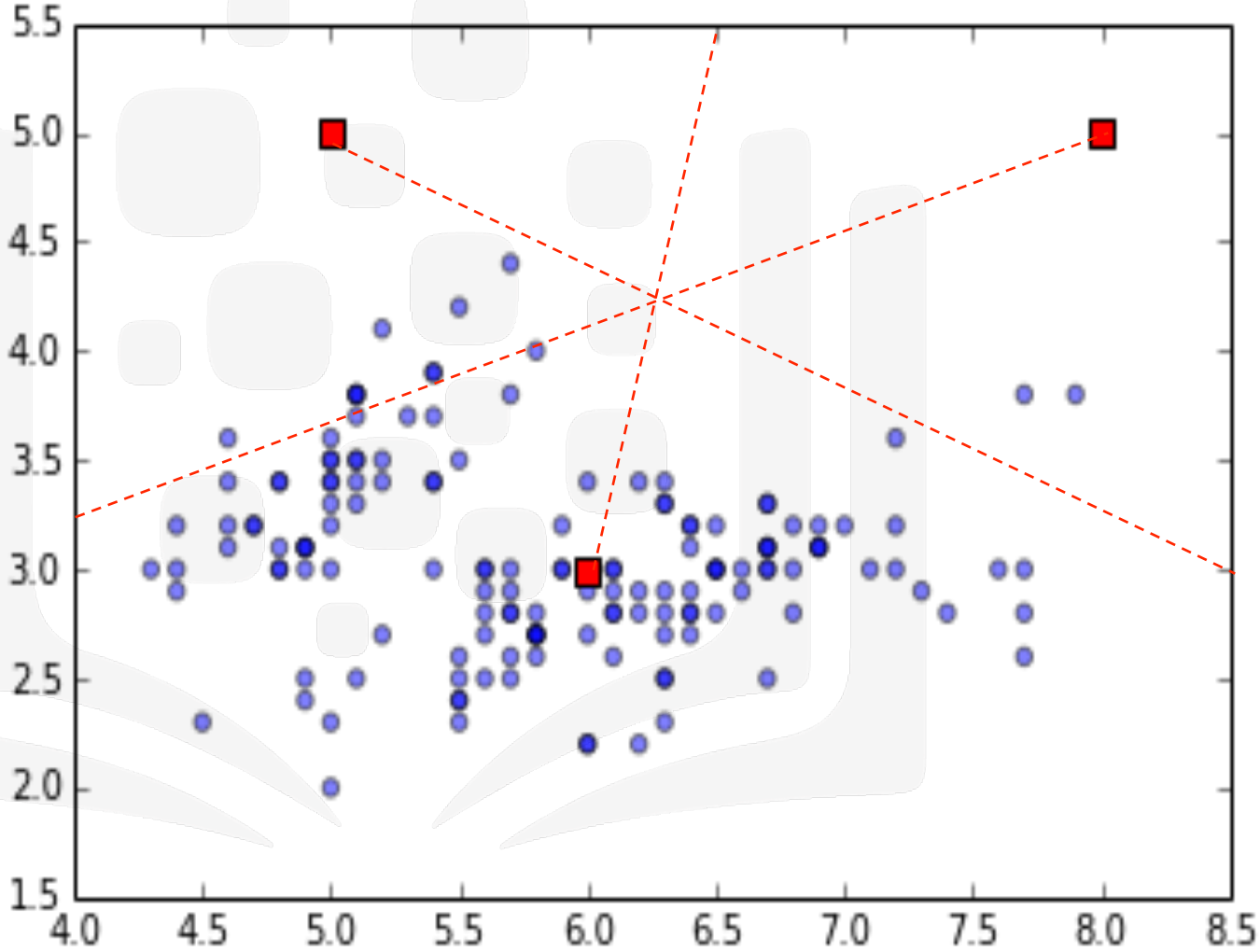
K-means Clustering

4) Find the closest center to each data point



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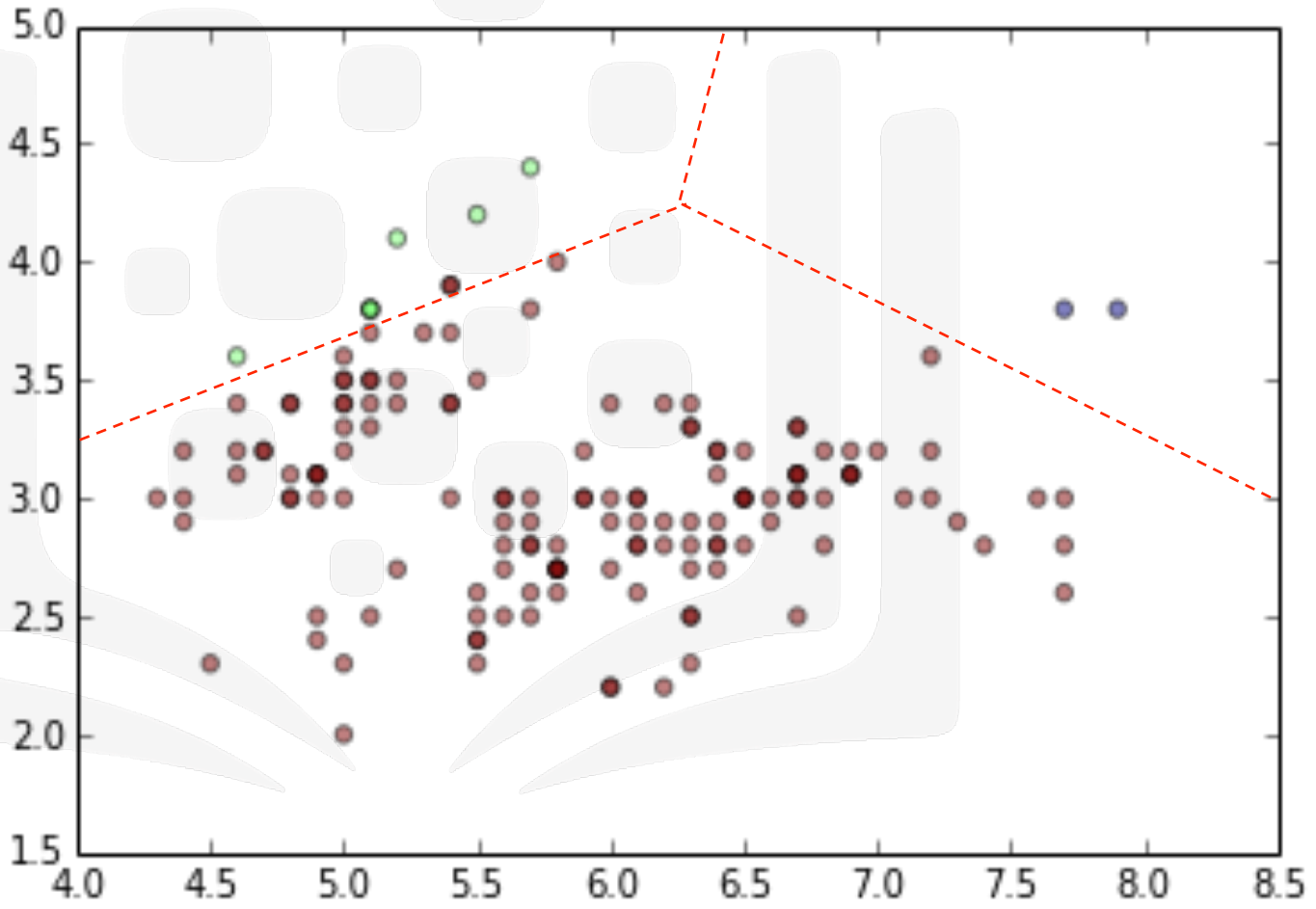
K-means Clustering

5) Assign each point to the closest centroid



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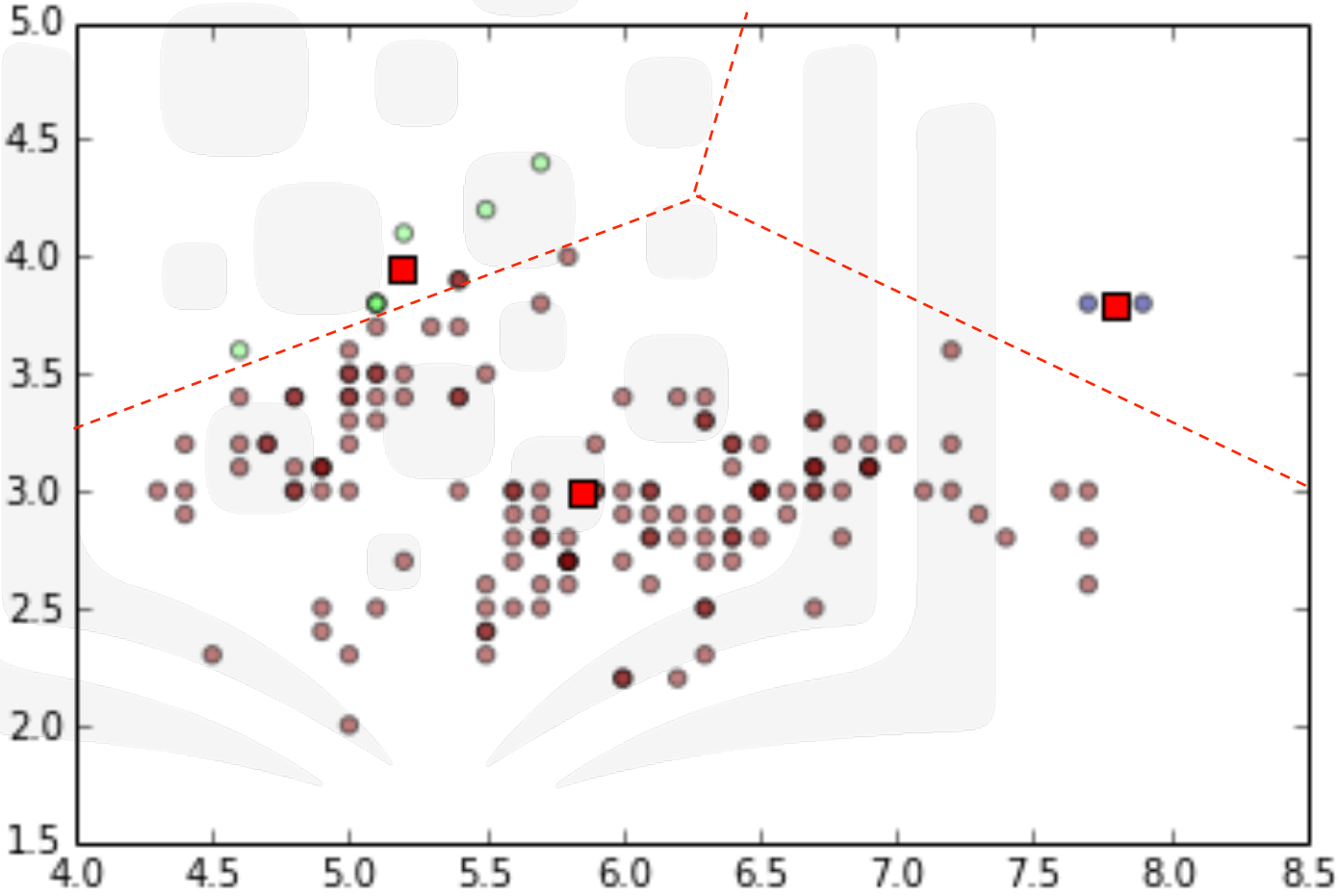
K-means Clustering

6) Compute the new centroids for each cluster.



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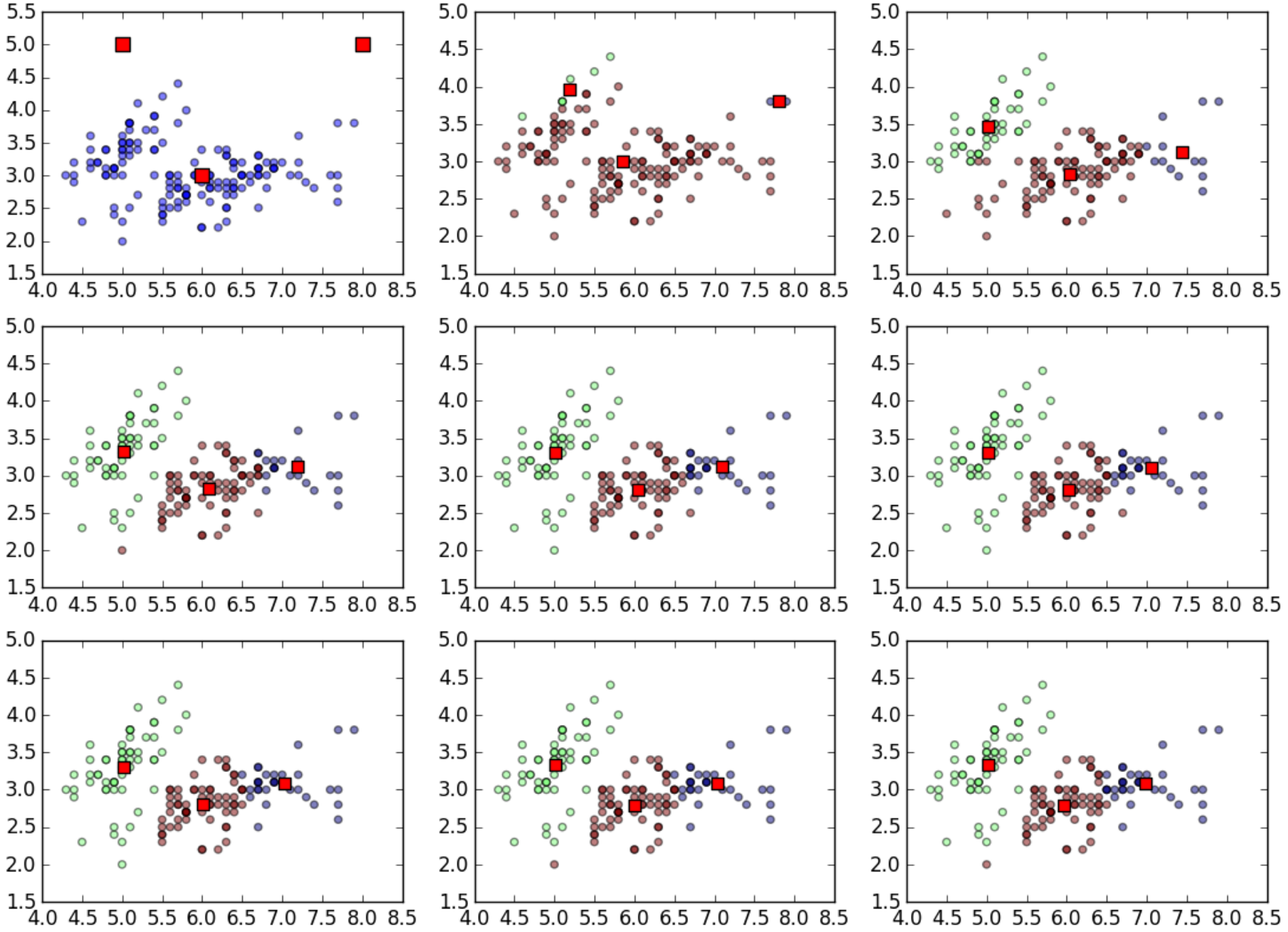
7) Repeat until there are no more changes



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www.BigDataUniversity.com

Let’s jump into DSX to look at come code!