Algorithm Cluster

ALGORITHM CLUSTER

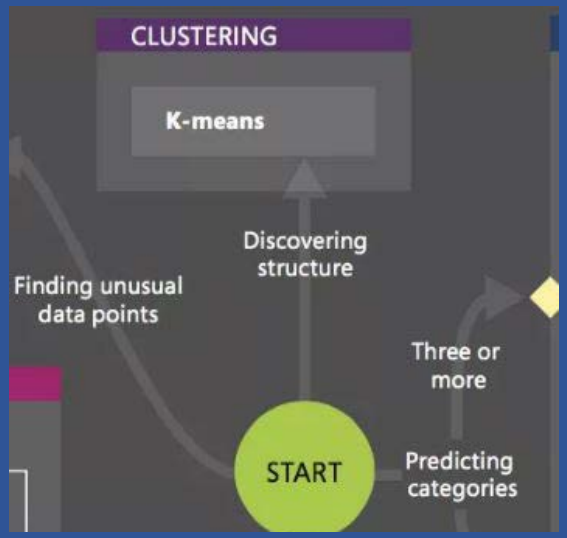
Algorithm Cluster

In this session

- Cluster Algorithms in Azure ML
- Model overview
- Dataset
- Feature Hashing module
- Train
- Edit Metadata

Algorithm Cluster

Cluster Algorithms in Azure ML



- Uses iterative techniques
- Group cases in a dataset into clusters
- Contain similar characteristics
- Useful for exploring data
- Identifying anomalies in the data
- Making predictions
- Identify relationships in a dataset
- Not logically derive by browsing or simple observation
- Used in the early phases of machine learning tasks
- Explore the data and discover unexpected correlations
- Only algorithm in AML that is Unsupervised

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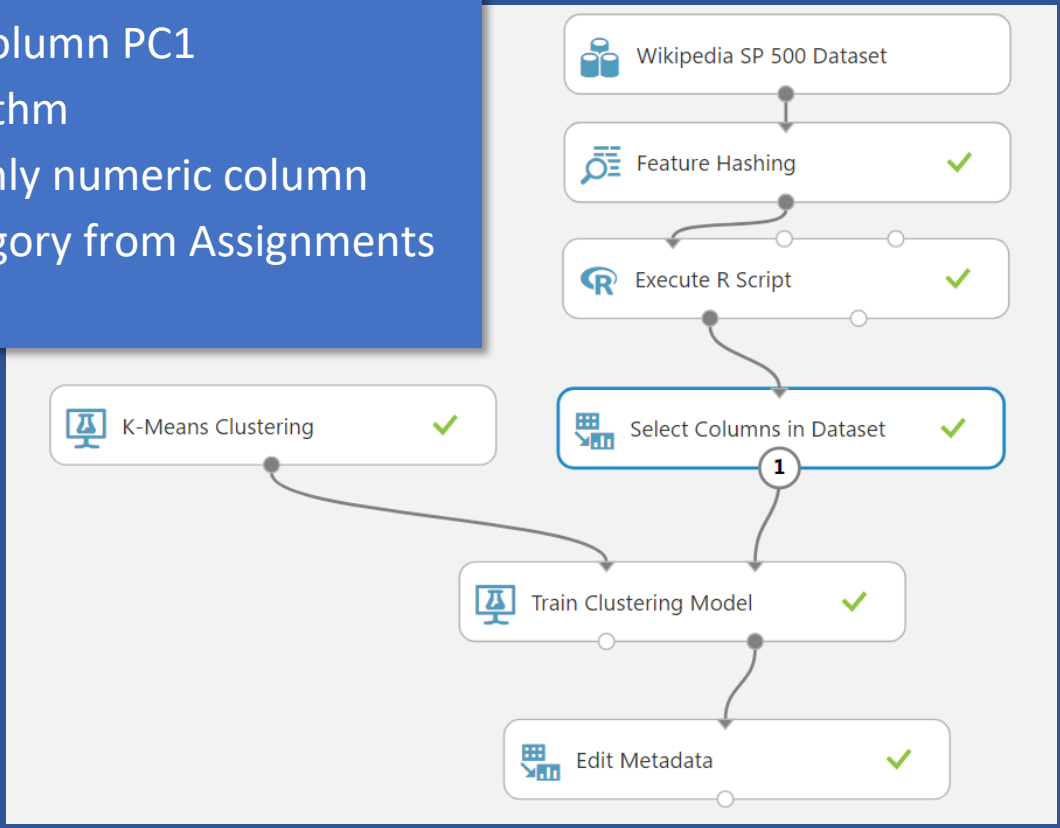
Model overview

- Dataset: Wikipedia SP 500 Dataset
- Feature Hashing: create feature from column Text
- R Script: reduce feature to 10 columns
- Select Columns: exclude column PC1
- K-Means: clustering algorithm
- Train: train model using only numeric column
- Edit Metadata: make category from Assignments column



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Dataset

rows 466 columns 3

view as

Title	Category	Text
Apple Inc.	Information Technology	nasdaq 100 component s p 500 component foundation founder location city apple campus 1 infinite loop street infinite loop cupertino california cupertino california location country united

Pre-processed outside Azure ML Studio

- Removing wiki formatting
- Removing non-alphanumeric characters
- Converting all text to lowercase
- Adding company categories, where known

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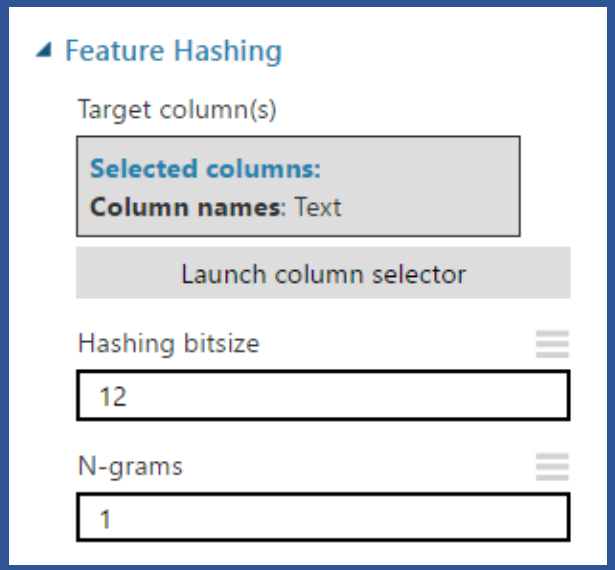
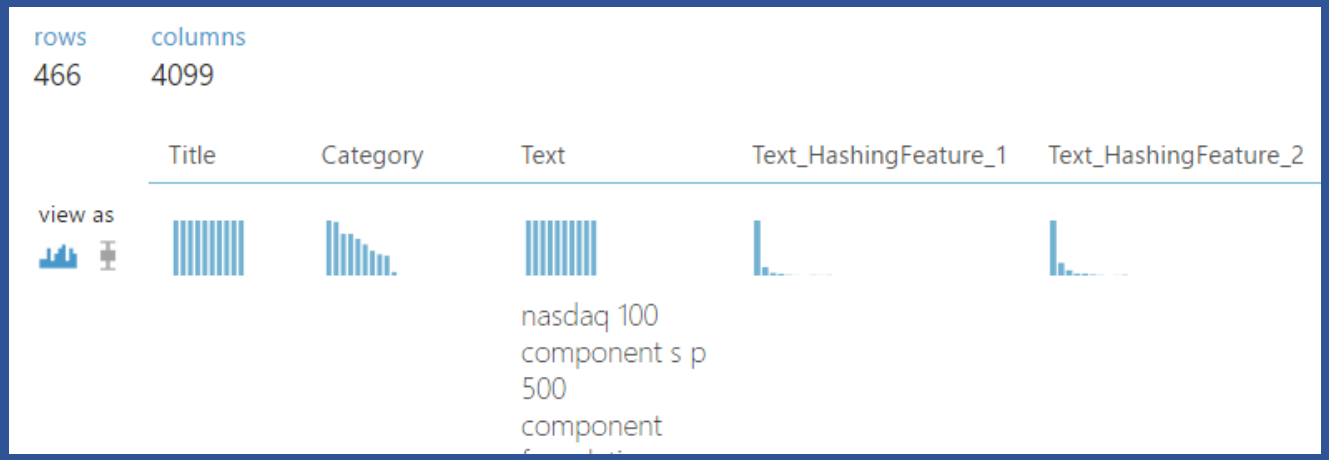
Feature Hashing module

Feature Hashing module

- Tokenizes the text string
- Transforms the data into a series of numbers
- Based on the hash value of each token





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R Script

R Script

```
1 dataset1 <- maml.mapInputPort(1)
2 titles_categories = dataset1[,1:2]
3 pca = prcomp(dataset1[,4:4099])
4 top_pca_scores = data.frame(pca$x[,1:10])
5 data.set = cbind(titles_categories,top_pca_scores)
6 maml.mapOutputPort("data.set");
```

Execute R Script

R Script

```
1 dataset1 <- maml.mapInputPo
2 titles_categories = dataset
3 pca = prcomp(dataset1[,4:40
4 top_pca_scores = data.frame
5 data.set = cbind(titles_cat
6 maml.mapOutputPort("data.se
```

Random Seed

43

R Version

CRAN R 3.1.0

- Dimensionality of the data from hashing is too high (4K)
- Cannot be used by the K-Means clustering algorithm directly
- Principal Component Analysis (PCA) was applied using a custom R script
- Reduce the dimensionality to 10 variables
- View the result = double-clicking the right-hand output of the Execute R Script

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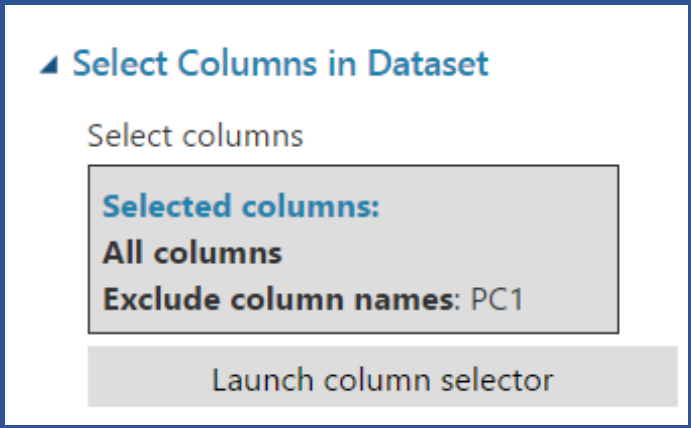
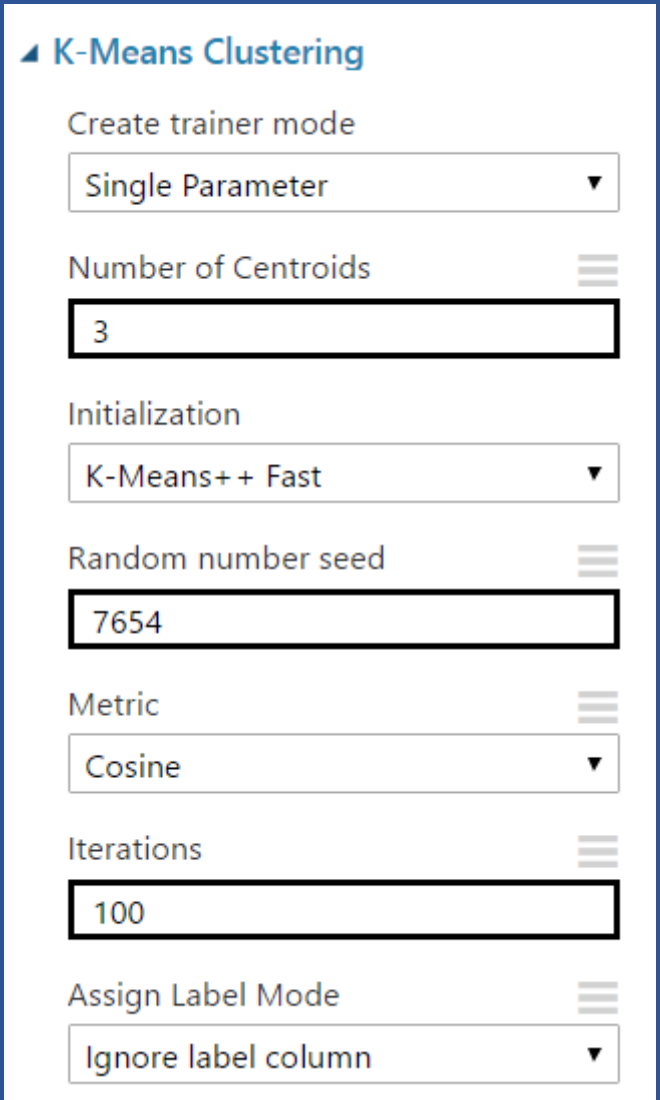
- Select Columns in Dataset
- K-Means Clustering

https://msdn.microsoft.com/en-us/library/azure/dn905944.aspx





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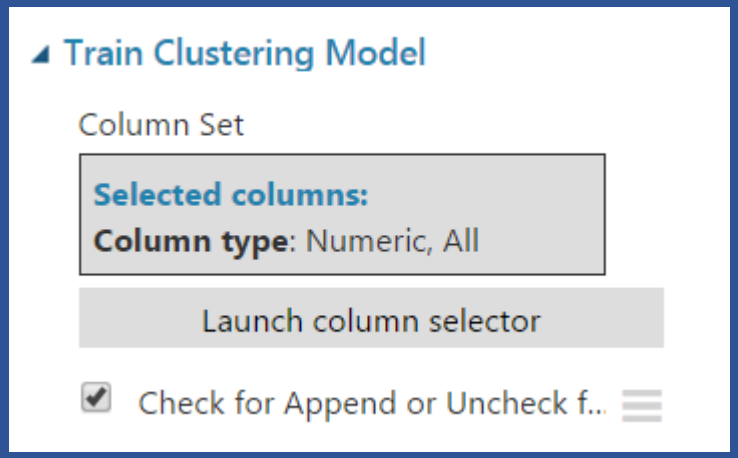
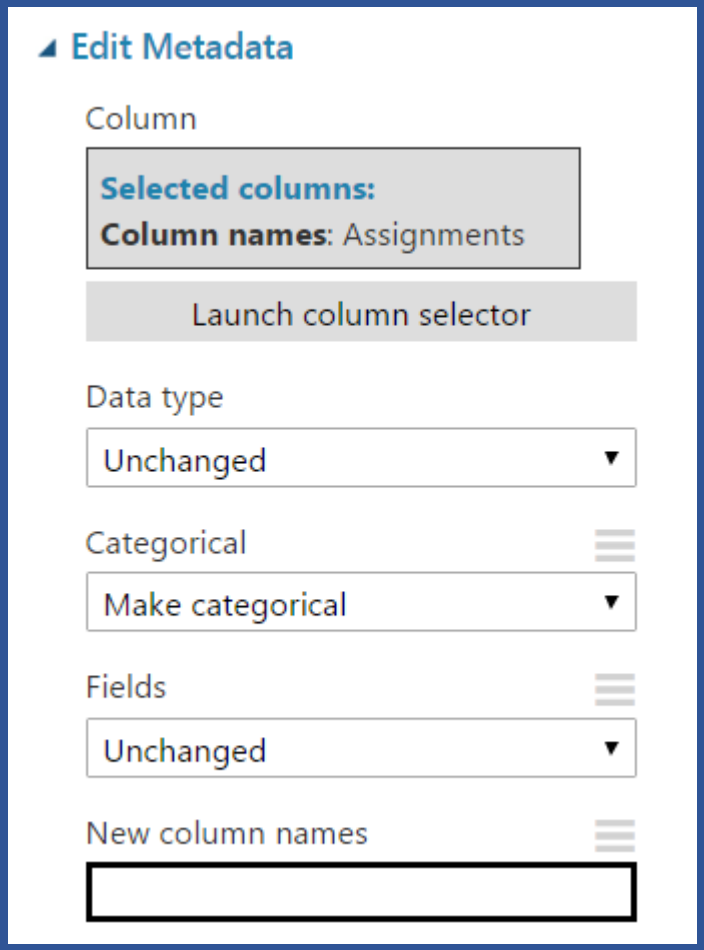
- Train Clustering Model
- Edit Metadata





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More information

K-Means Clustering

https://msdn.microsoft.com/en-us/library/azure/dn905944.aspx

This Experiment

https://gallery.cortanaintelligence.com/Experiment/Clustering-K-Means-basic