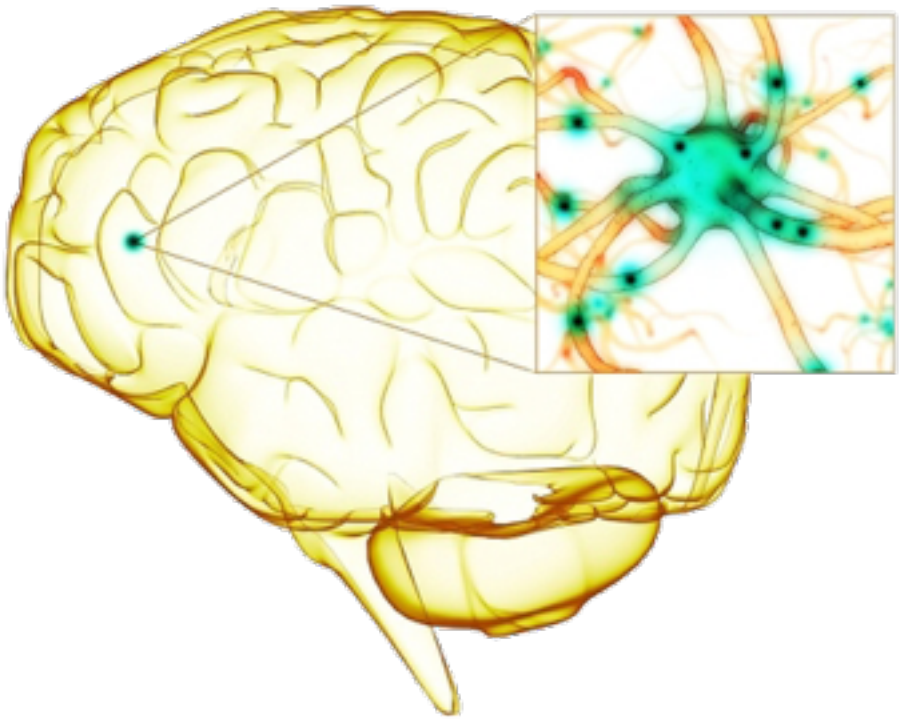
Introduction to Machine Learning



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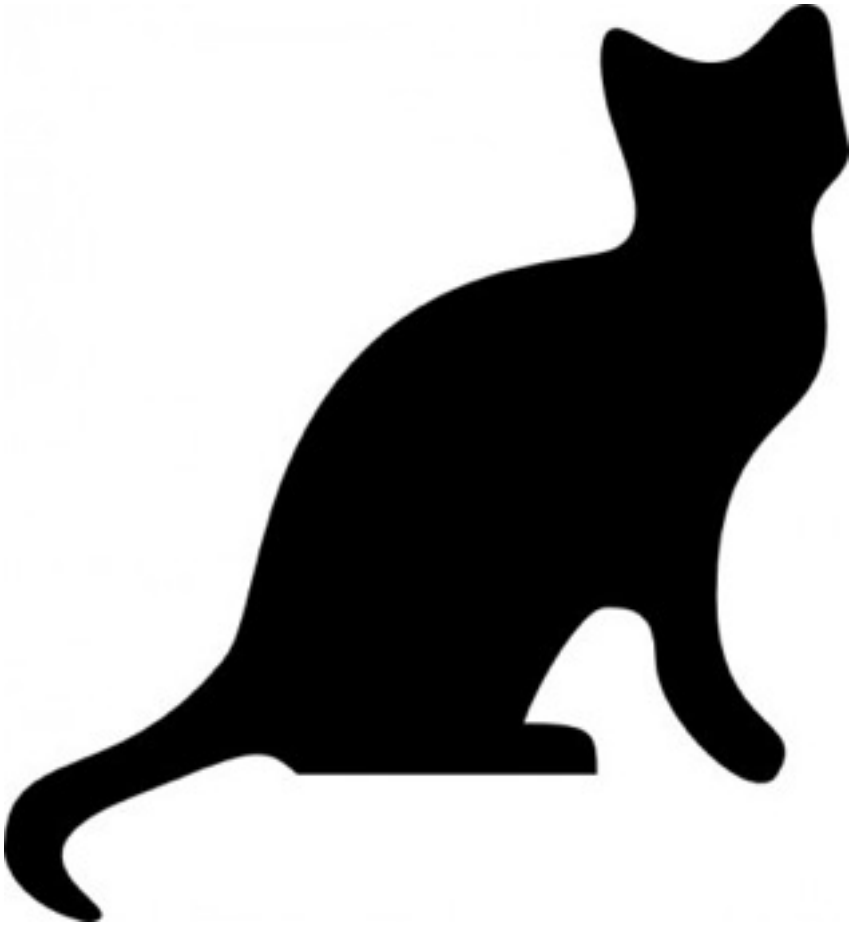

Introduction to Machine Learning

We need to know if this cat is **male** or **female**

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Machine Learning algorithm learns from examples,

set of sample objects (samples) is called **?**

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Machine Learning algorithm learns from examples,

set of sample objects (samples) is called **training set**

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Each object (**?**)

can be described with a set of parameters called **?**

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Each object (**instance**)

can be described with a set of parameters called **?**

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Each object (**instance**)

can be described with a set of parameters called **features**

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Tail length f_1:  ...

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Tail length f_1:  ...

Furriness f_2:  ...

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Tail length f_1:  ...

Furriness f_2:  ...

Form a **?** $\mathbf{f} = (f_1, f_2)$

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Tail length f_1:  ...

Furriness f_2:  ...

Form a **feature vector** $\mathbf{f} = (f_1, f_2)$

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Together feature vectors and corresponding classes form a **?**

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Together feature vectors and corresponding classes form a **dataset**

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Together feature vectors and corresponding classes form a **dataset**

Instance

Cat 1

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Together feature vectors and corresponding classes form a **dataset**

Instance	**Feature 1**
Cat 1	8 cm

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Together feature vectors and corresponding classes form a **dataset**

Instance	**Feature 1**	**Feature 2**
Cat 1	8 cm	546 h/cm2

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Together feature vectors and corresponding classes form a **dataset**

Instance	**Feature 1**	**Feature 2**	**?**
Cat 1	8 cm	546 h/cm2	M

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Together feature vectors and corresponding classes form a **dataset**

Instance	**Feature 1**	**Feature 2**	**Class**
Cat 1	8 cm	546 h/cm2	M

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Together feature vectors and corresponding classes form a **dataset**

Instance	**Feature 1**	**Feature 2**	**Class**
Cat 1	8 cm	546 h/cm2	M
Cat 2	7.5 cm	363 h/cm2	M
…	…	…	…
Cat N	11 cm	614 h/cm2	F

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Feature vector lives in a **?**

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Feature vector lives in a **feature space**

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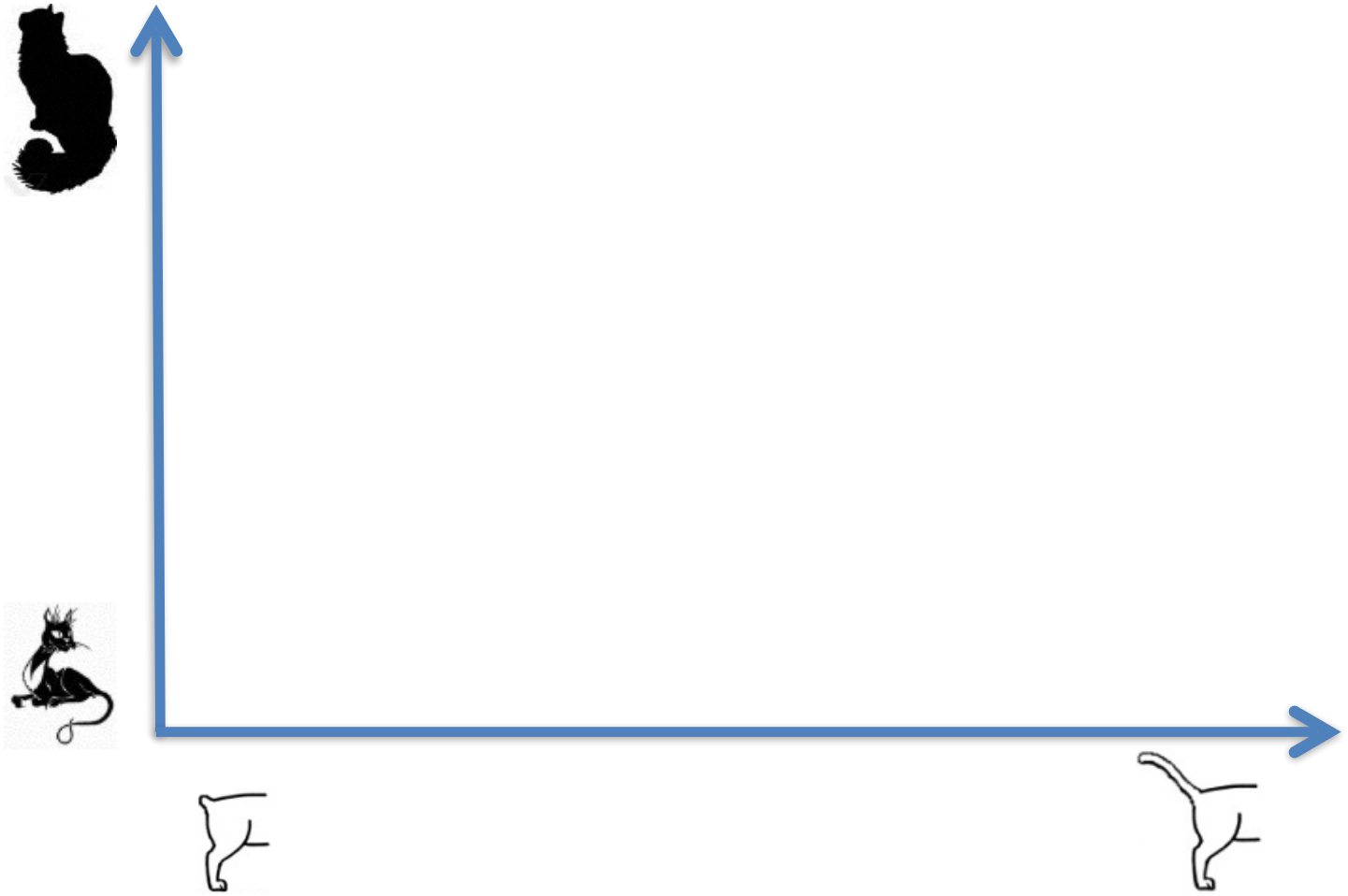
Feature vector lives in a **feature space**



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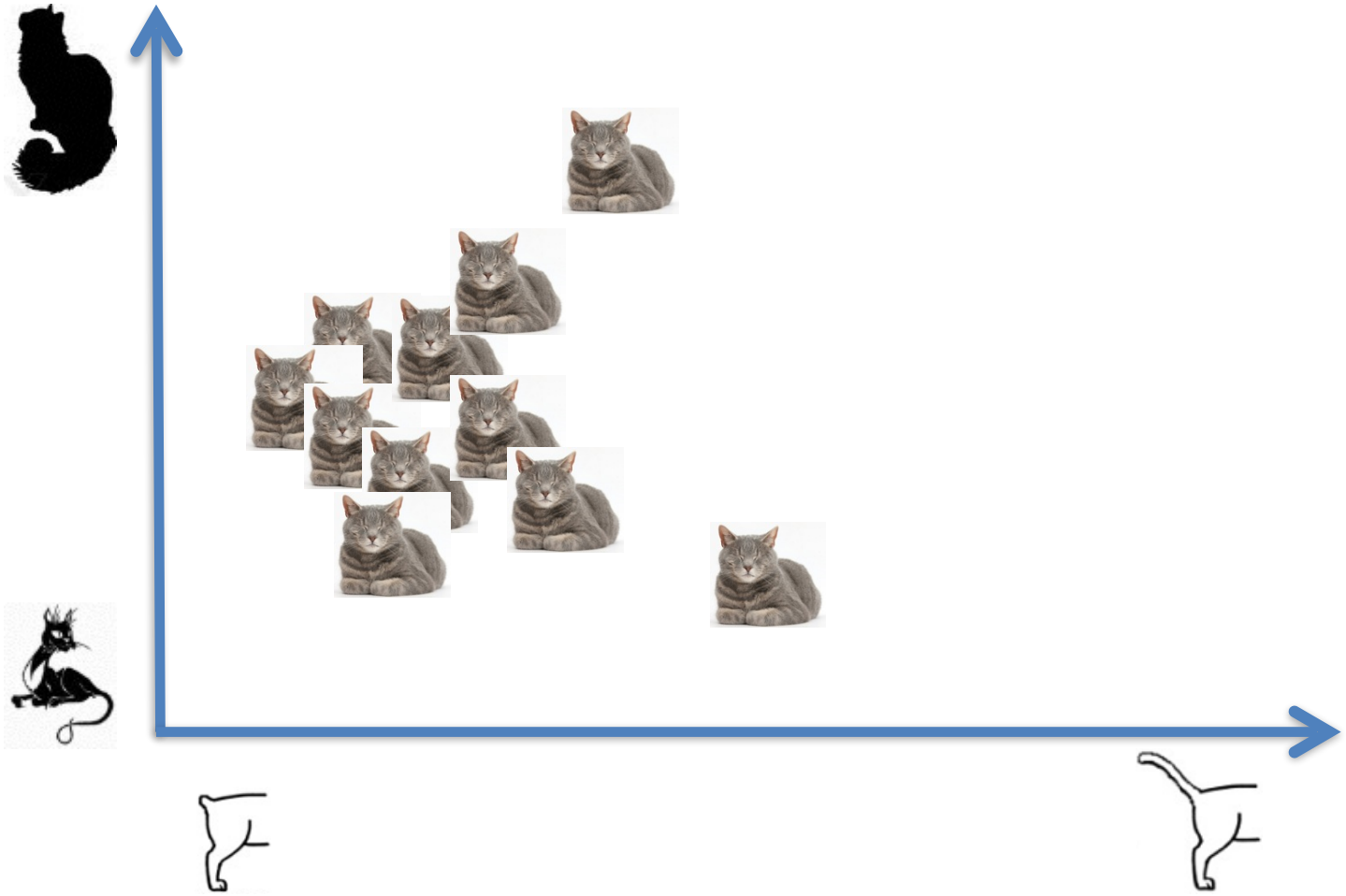
Feature vector lives in a **feature space**



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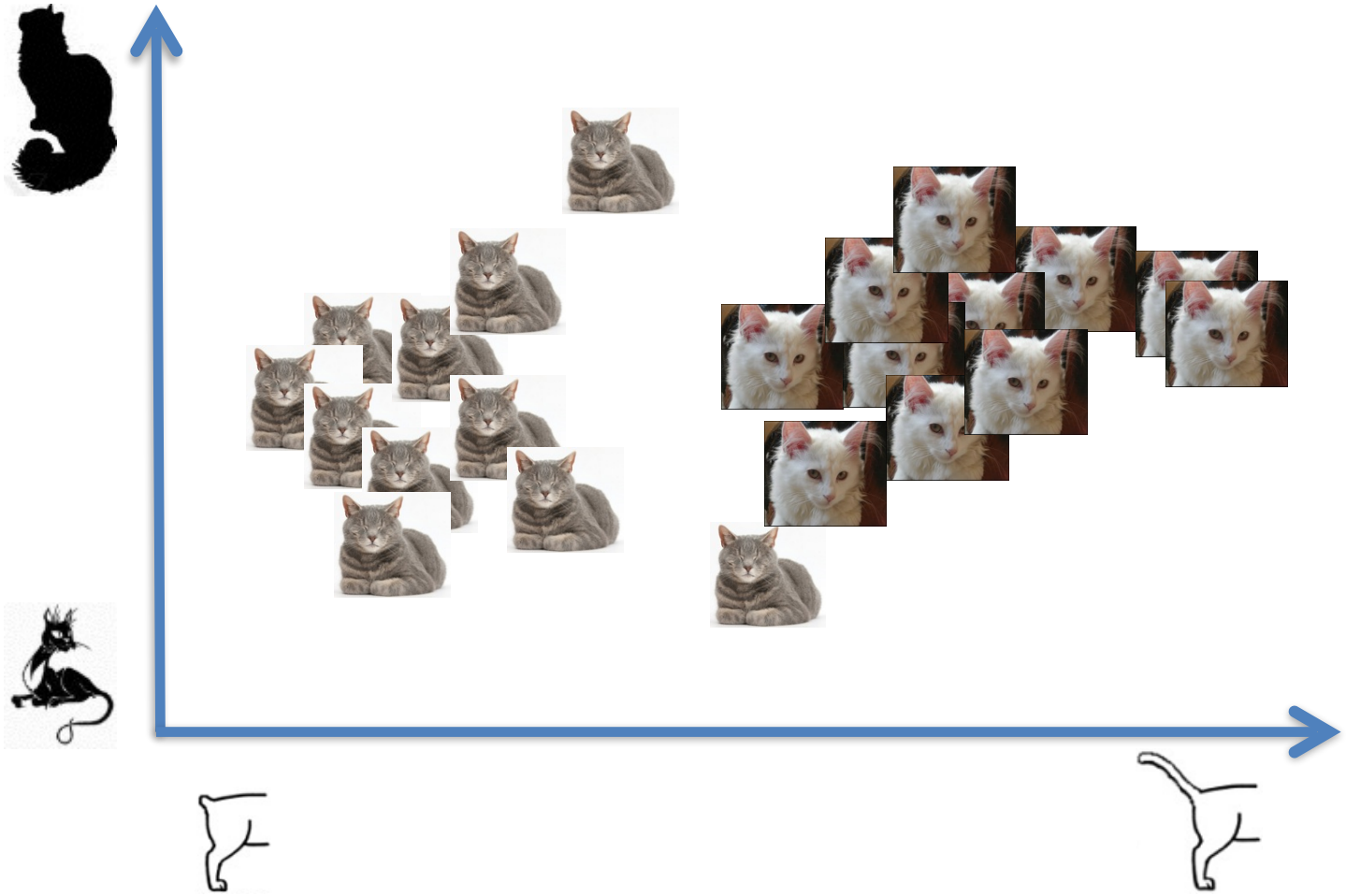
Feature vector lives in a **feature space**



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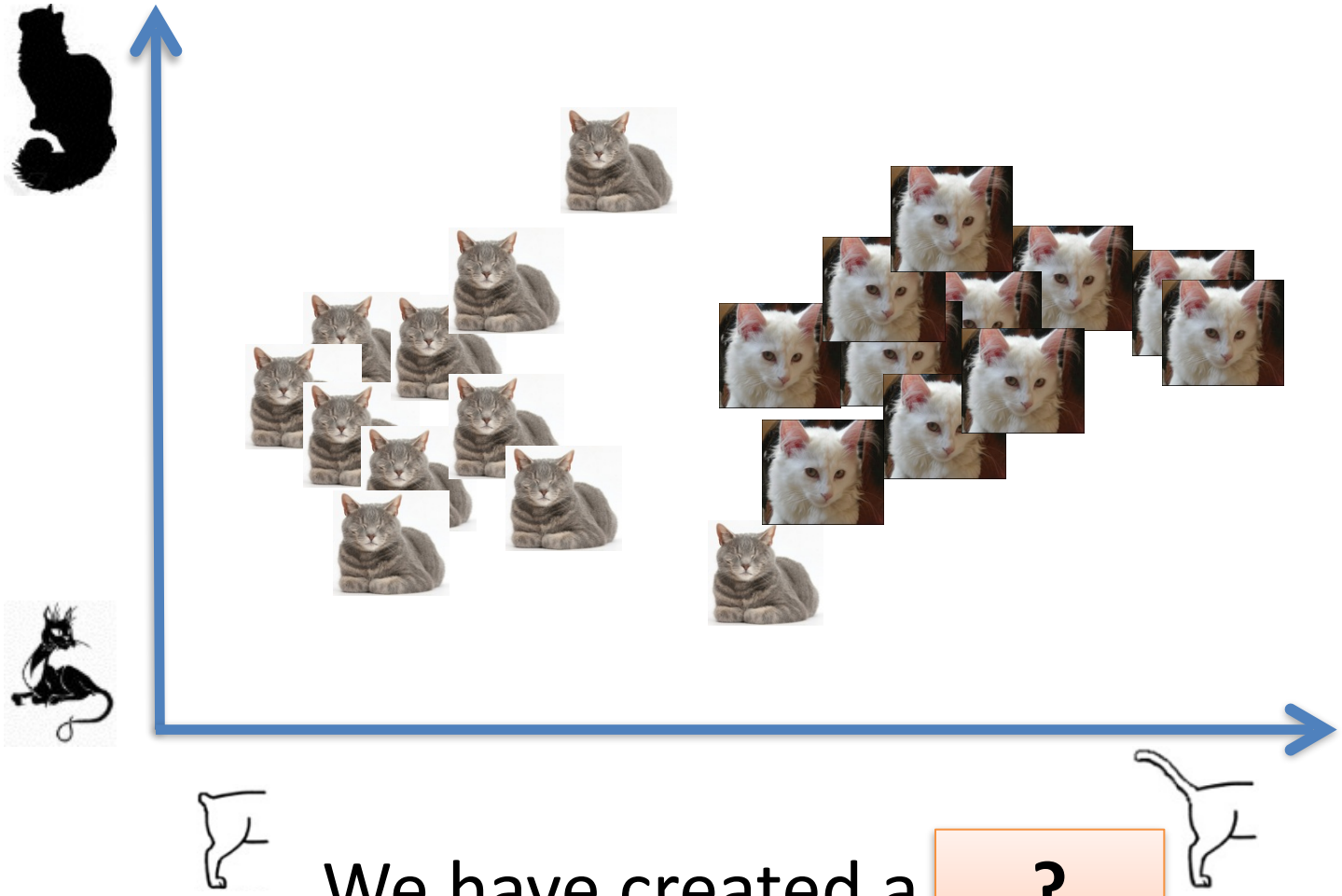
Feature vector lives in a **feature space**



We have created a **?**

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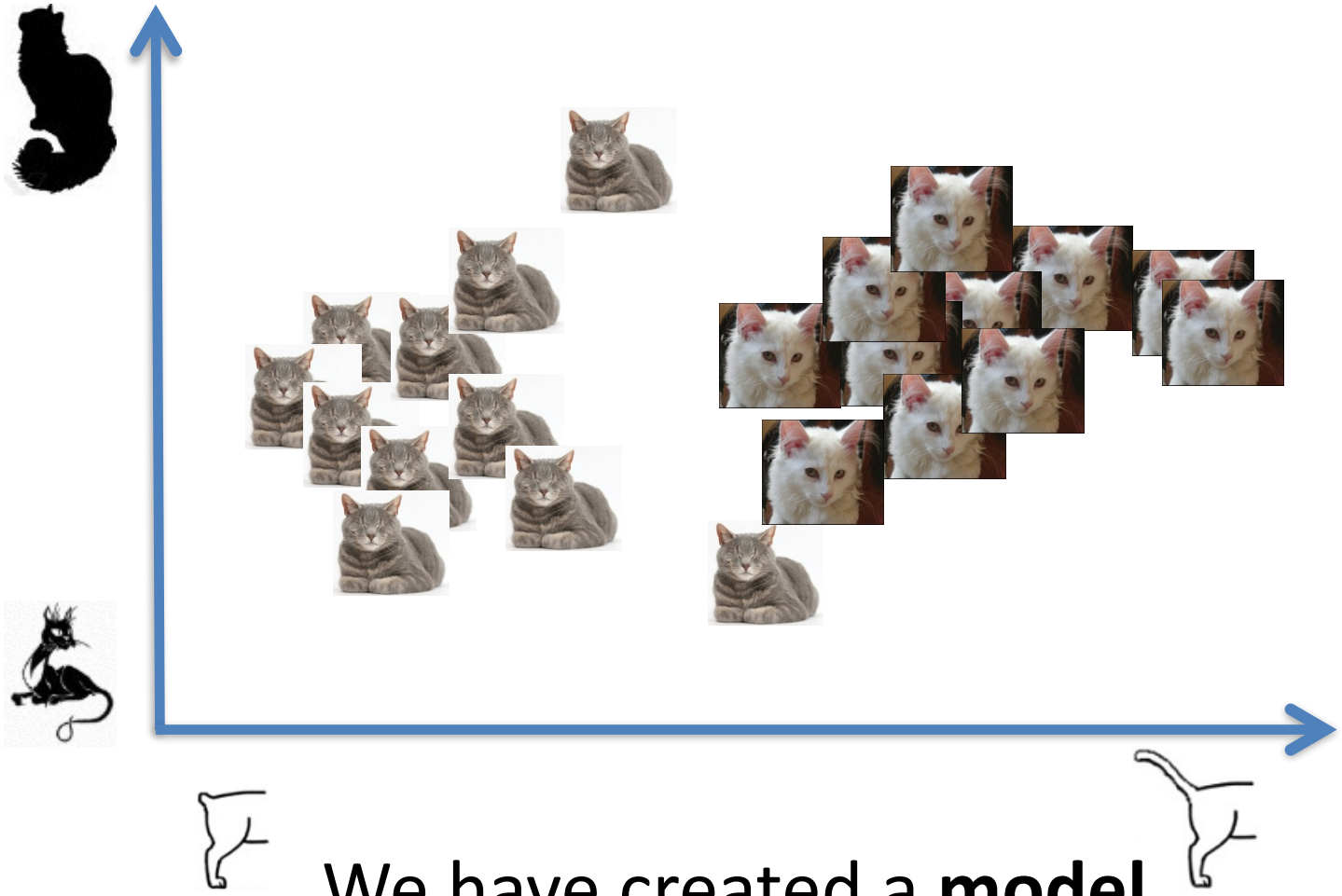
Feature vector lives in a **feature space**



We have created a **model**

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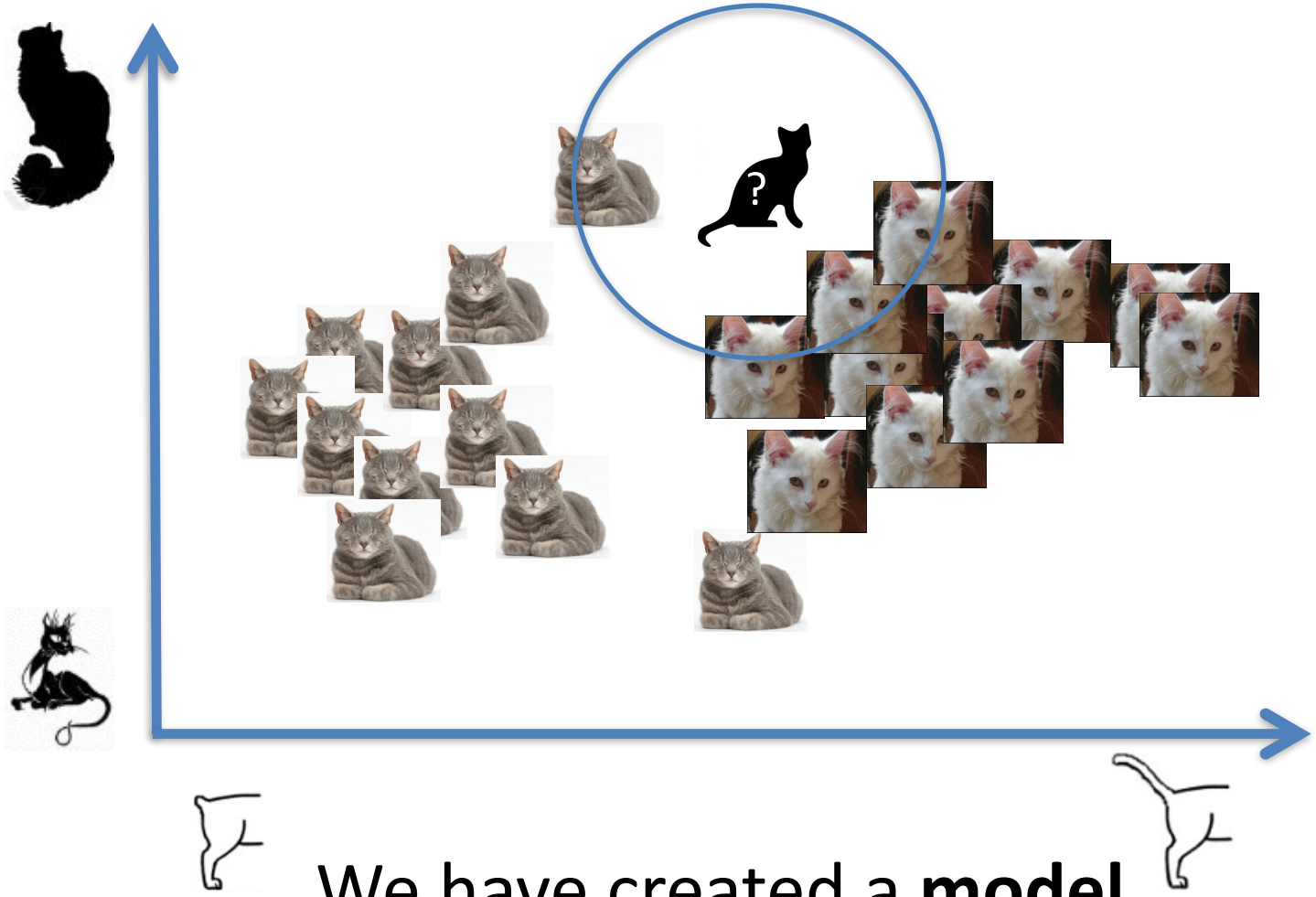
Feature vector lives in a **feature space**



We have created a **model**

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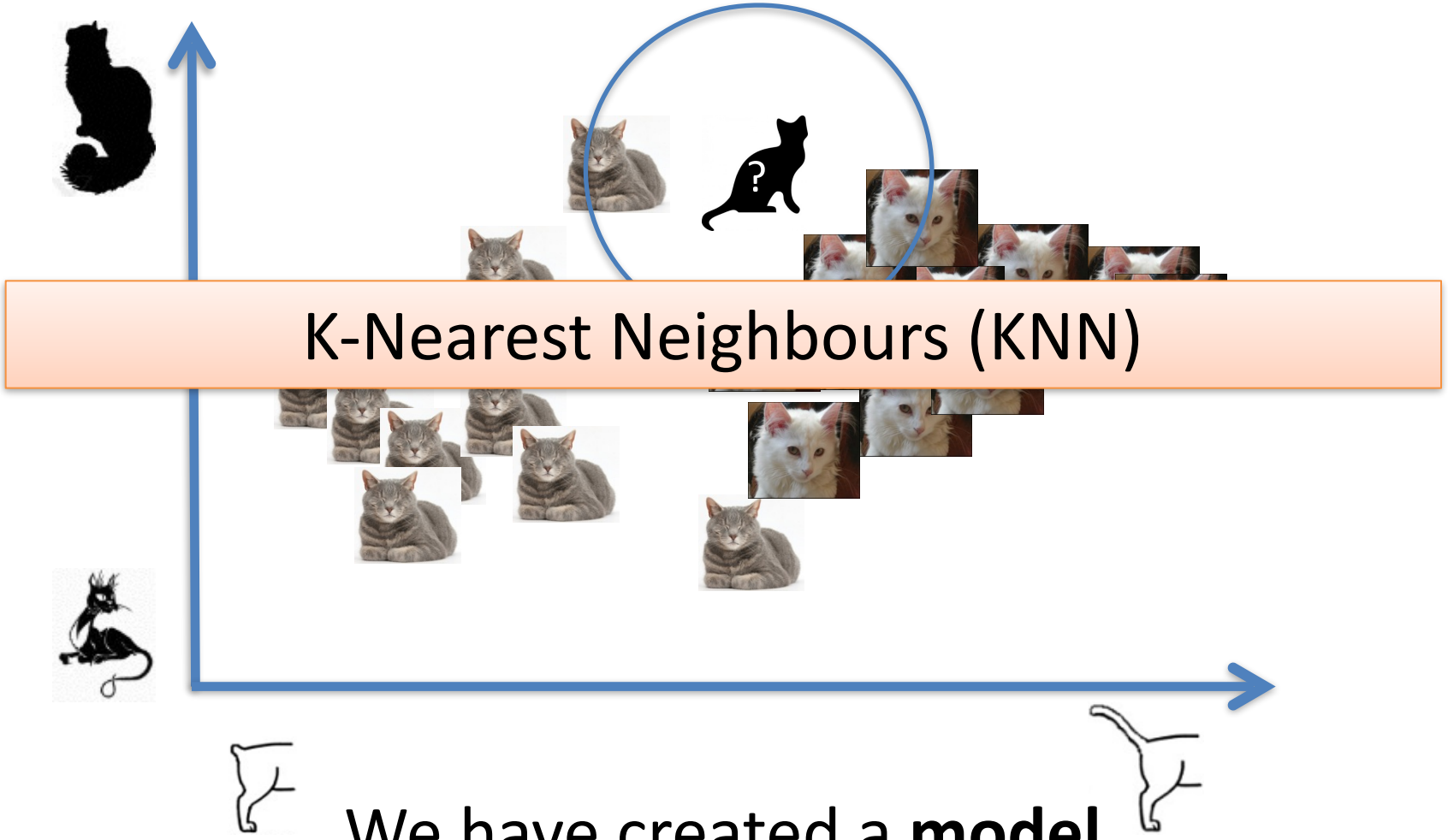
Feature vector lives in a **feature space**



We have created a **model**

Introduction to Machine Learning

- Decision trees
- C4.5
- Random forests
- Bayesian networks
- Hidden Markov models
- Artificial neural network
- Data clustering
- Expectation-maximization algorithm
- Self-organizing map
- Radial basis function network
- Vector Quantization
- Generative topographic map
- Information bottleneck method
- IBSEAD
- Apriori algorithm
- Eclat algorithm
- FP-growth algorithm
- Single-linkage clustering
- Conceptual clustering
- K-means algorithm
- Fuzzy clustering
- Temporal difference learning
- Q-learning
- Learning Automata
- Monte Carlo Method
- SARSA
- AODE
- Artificial neural network
- Backpropagation
- Naive Bayes classifier
- Bayesian network
- Bayesian knowledge base
- Case-based reasoning
- Decision trees
- Inductive logic programming
- Gaussian process regression
- Gene expression programming
- Group method of data handling (GMDH)
- Learning Automata
- Learning Vector Quantization
- Logistic Model Tree
- Decision trees
- Decision graphs
- Lazy learning
- Instance-based learning
- Nearest Neighbor Algorithm
- Analogical modeling
- Probably approximately correct learning (PAC
- Symbolic machine learning algorithms
- Subsymbolic machine learning algorithms
- Support vector machines
- Random Forests
- Ensembles of classifiers
- Bootstrap aggregating (bagging)
- Boosting (meta-algorithm)
- Ordinal classification
- Regression analysis
- Information fuzzy networks (IFN)
- ANOVA
- Linear classifiers
- Fisher's linear discriminant
- Logistic regression
- Naive Bayes classifier
- Perceptron
- Support vector machines
- Quadratic classifiers
- k-nearest neighbor
- Boosting

http://en.wikipedia.org/wiki/List_of_machine_learning_algorithms