

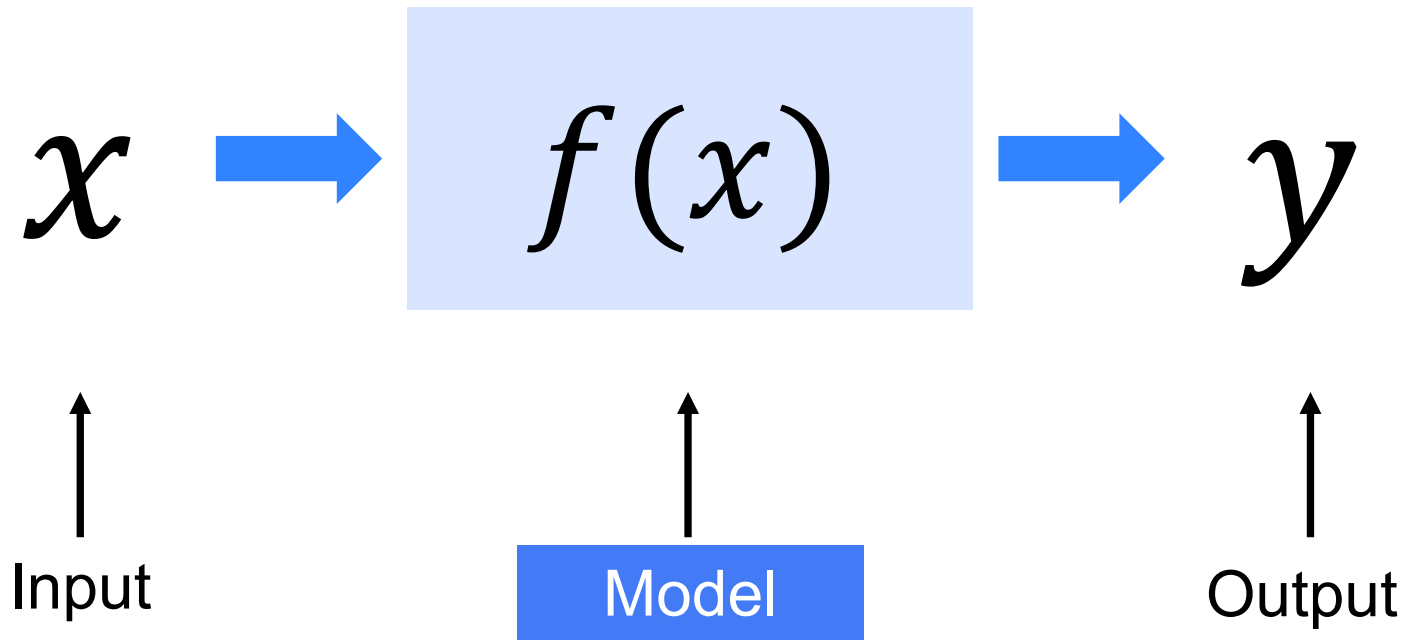
```
94 ...; // Gets a proper hex string
95 $color_val = hexdec($hex_str);
96 $rgb_array['r'] = 0xFF & ($color_val >> 0x10);
97 $rgb_array['g'] = 0xFF & ($color_val >> 0x8);
98 $rgb_array['b'] = 0xFF & $color_val;
99 } elseif( strlen($hex_str) == 3 ) {
100 $rgb_array['r'] = hexdec(str_repeat(substr($hex_str, 0, 1), 2));
101 $rgb_array['g'] = hexdec(str_repeat(substr($hex_str, 1, 1), 2));
102 $rgb_array['b'] = hexdec(str_repeat(substr($hex_str, 2, 1), 2));
103 } else {
104 return false;
105 }
106 }
107 }
108 // Draw
109 ...
```

Practical Machine Learning

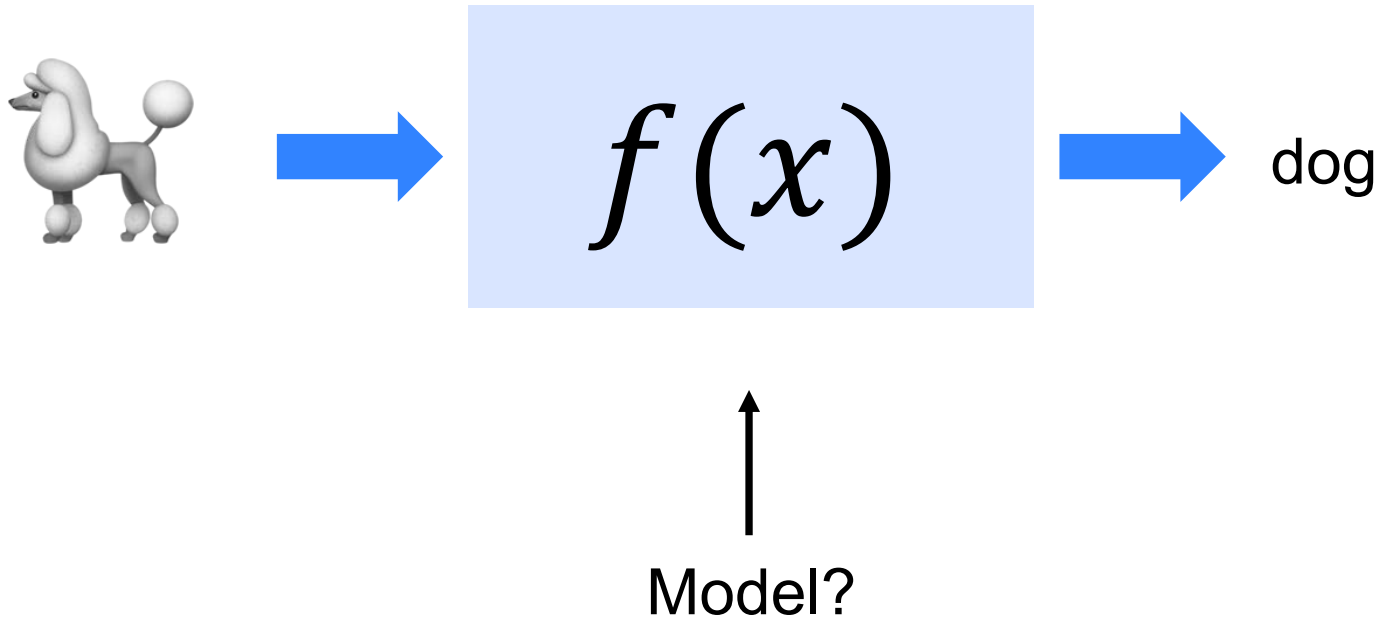
Supervised vs. Unsupervised Learning



Introduction into Machine Learning



Introduction into Machine Learning



*object recognition

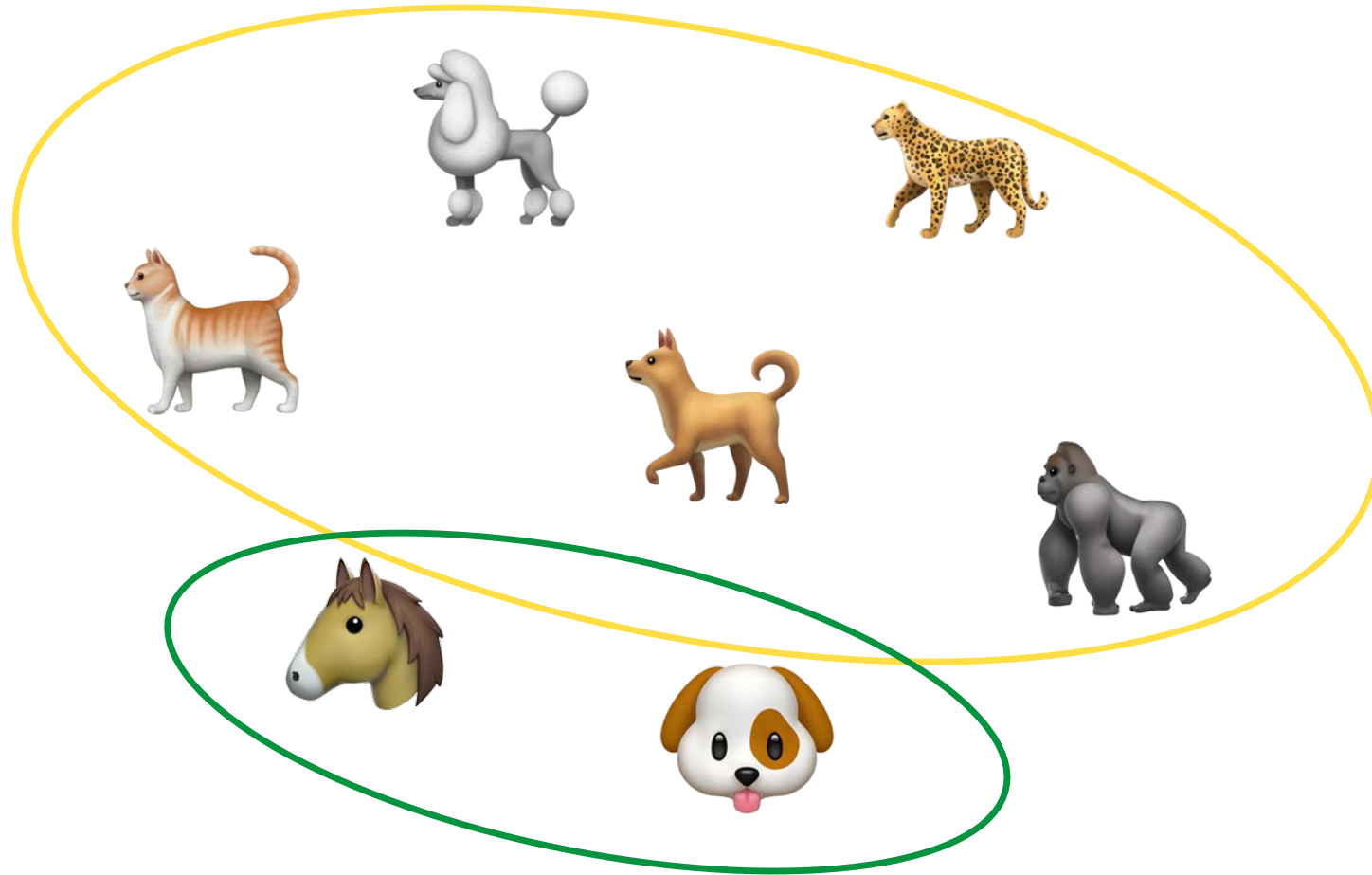
Types of ML Problems

What can we learn just by looking at the data?



Types of ML Problems

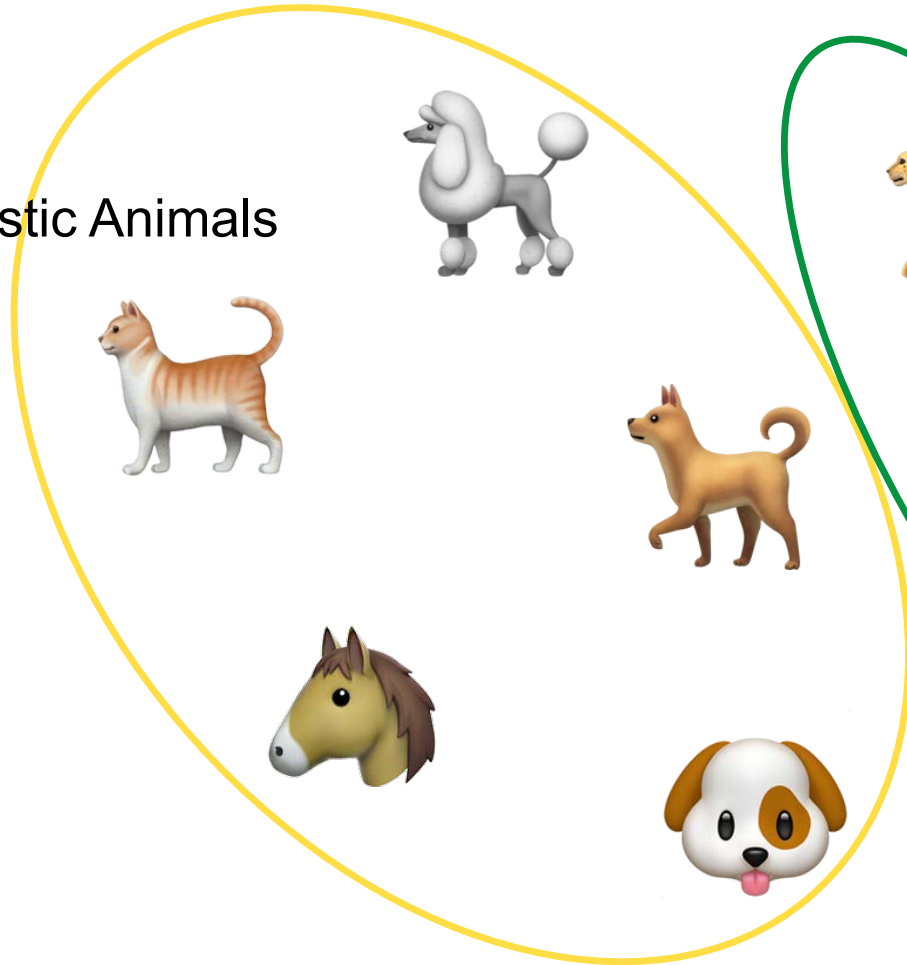
What can we learn just by looking at the data?



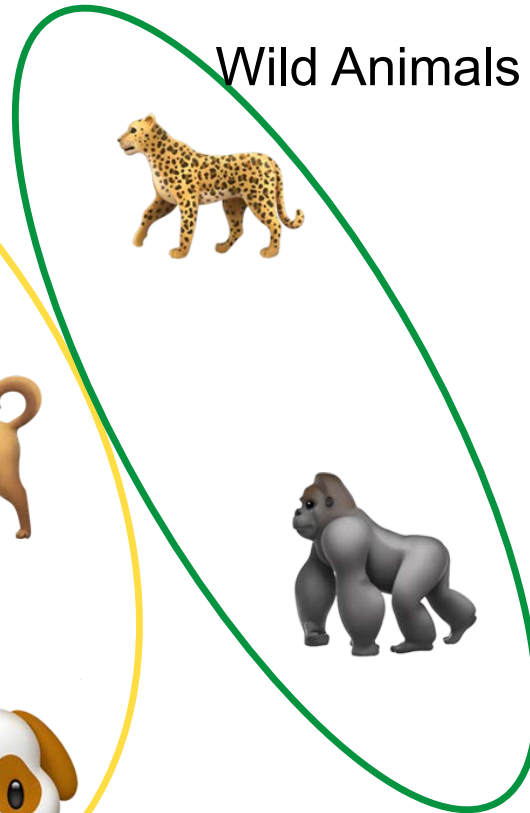
Types of ML Problems

What can we do with binned data?

Domestic Animals



Wild Animals



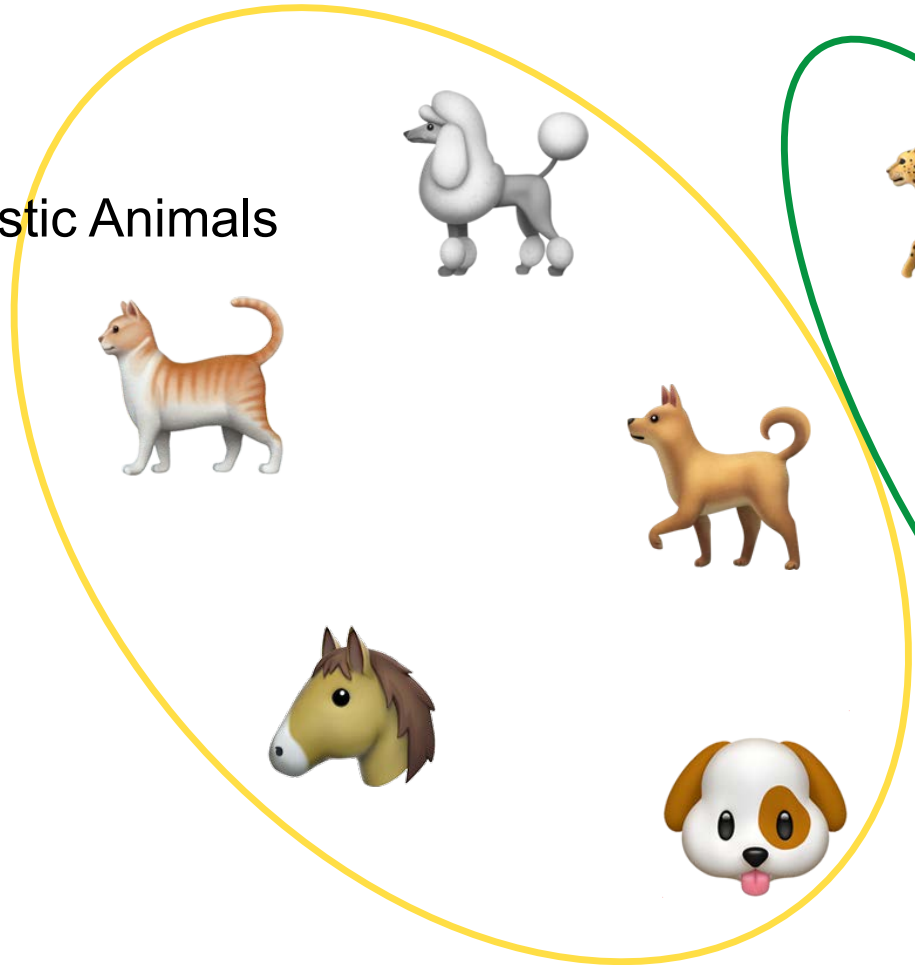
?



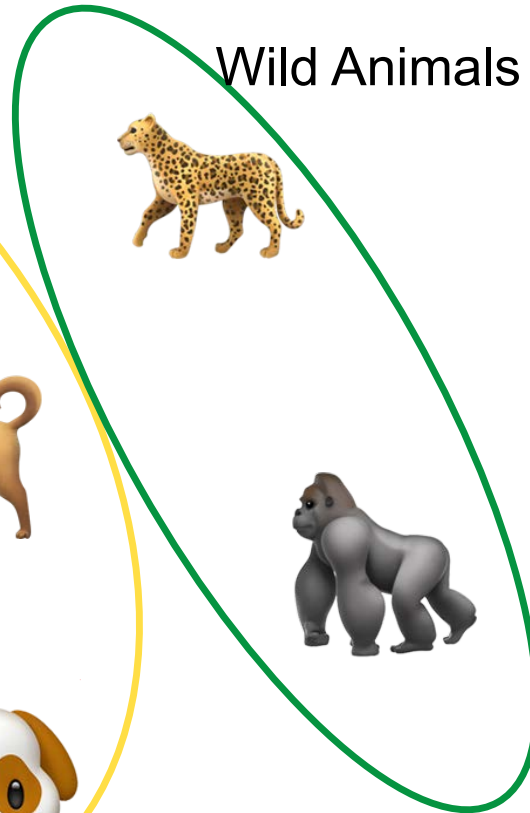
Types of ML Problems

What can we do with binned data?

Domestic Animals



Wild Animals



?



Learning Strategies

Supervised
Learning

Unsupervised
Learning

Learning Strategies

Supervised
Learning

Unsupervised
Learning

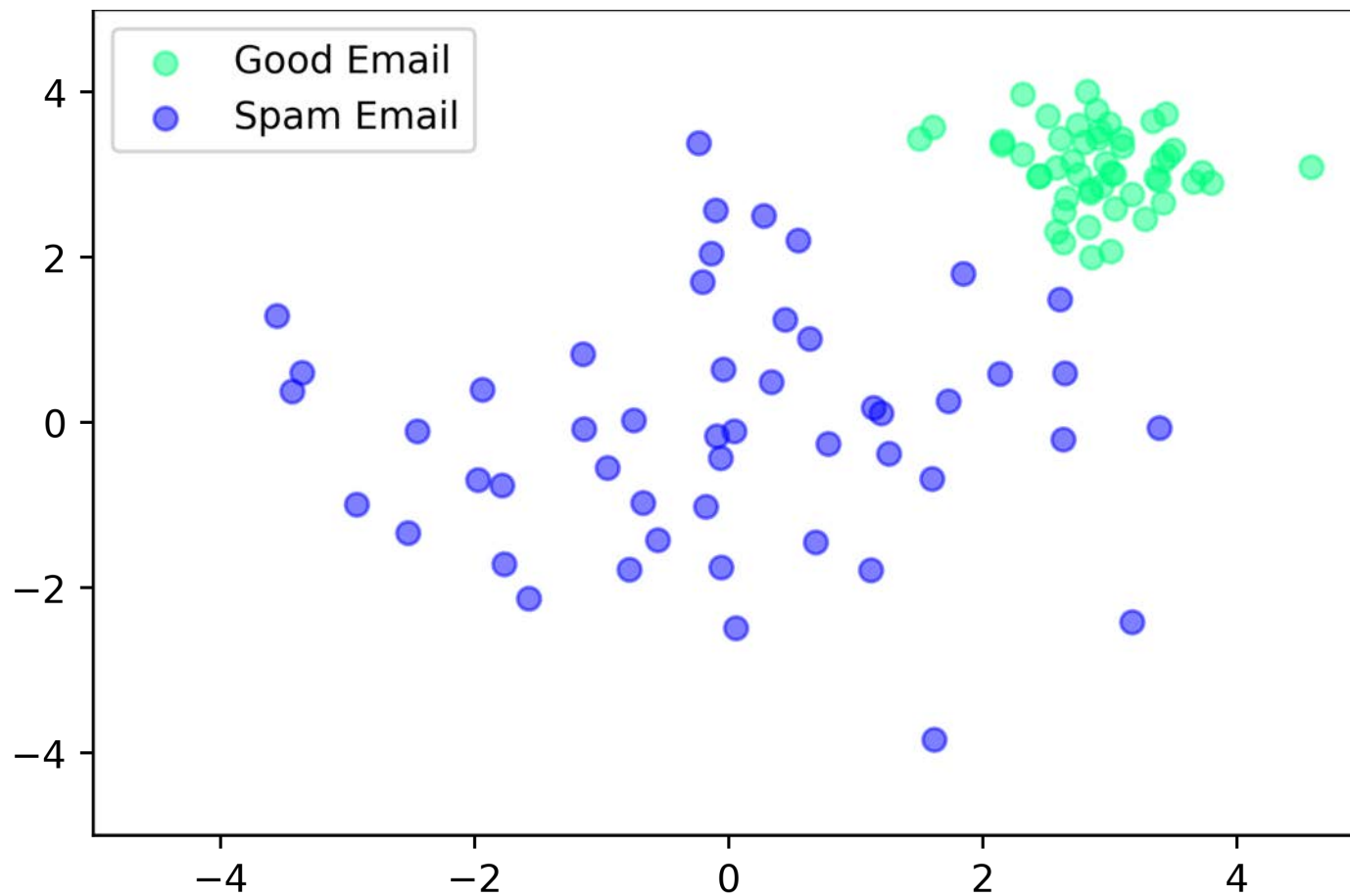
Reinforcement
learning

Learning Strategies

	Supervised Learning	Unsupervised Learning
Discrete	Classification or Categorization	Clustering
Continuous	Regression	Dimensionality reduction

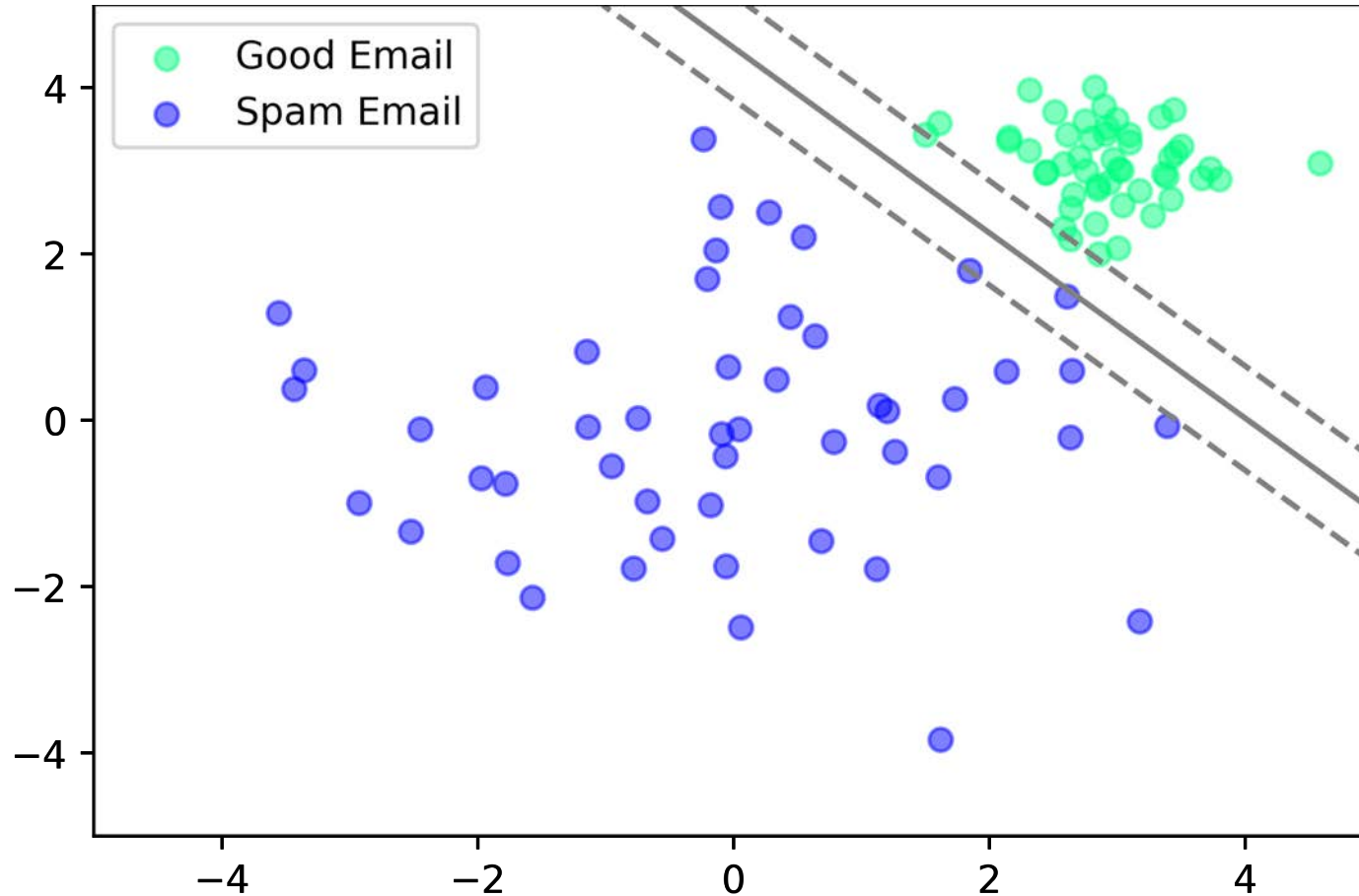
Supervised Learning

SVM Example



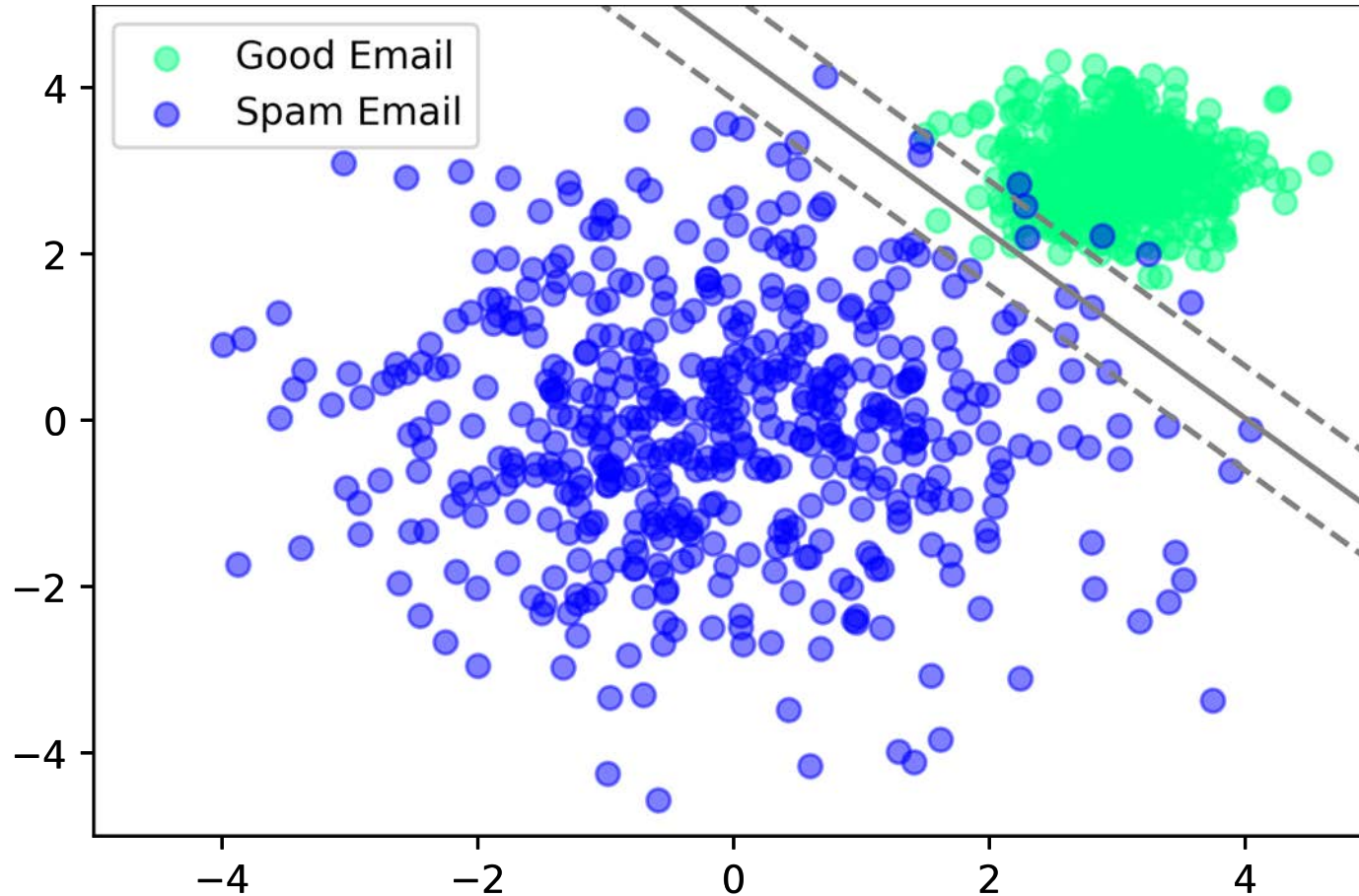
Supervised Learning

SVM Example

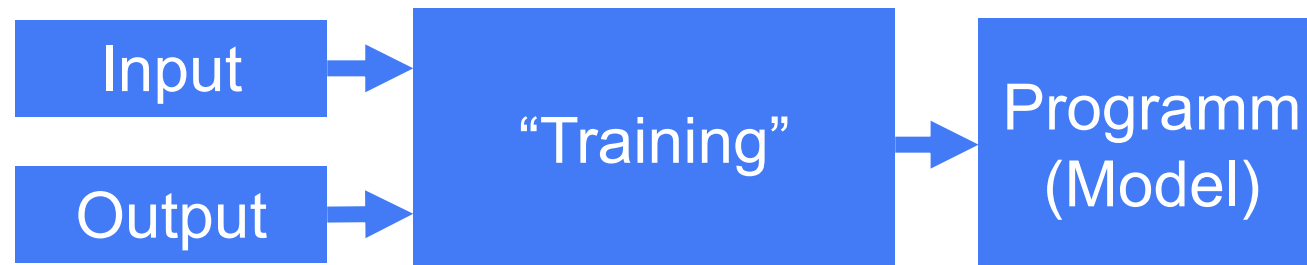


Supervised Learning

SVM Example

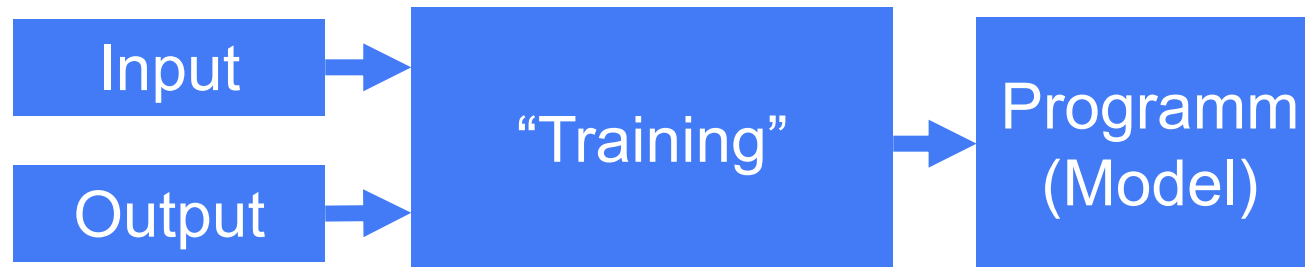


Supervised Learning



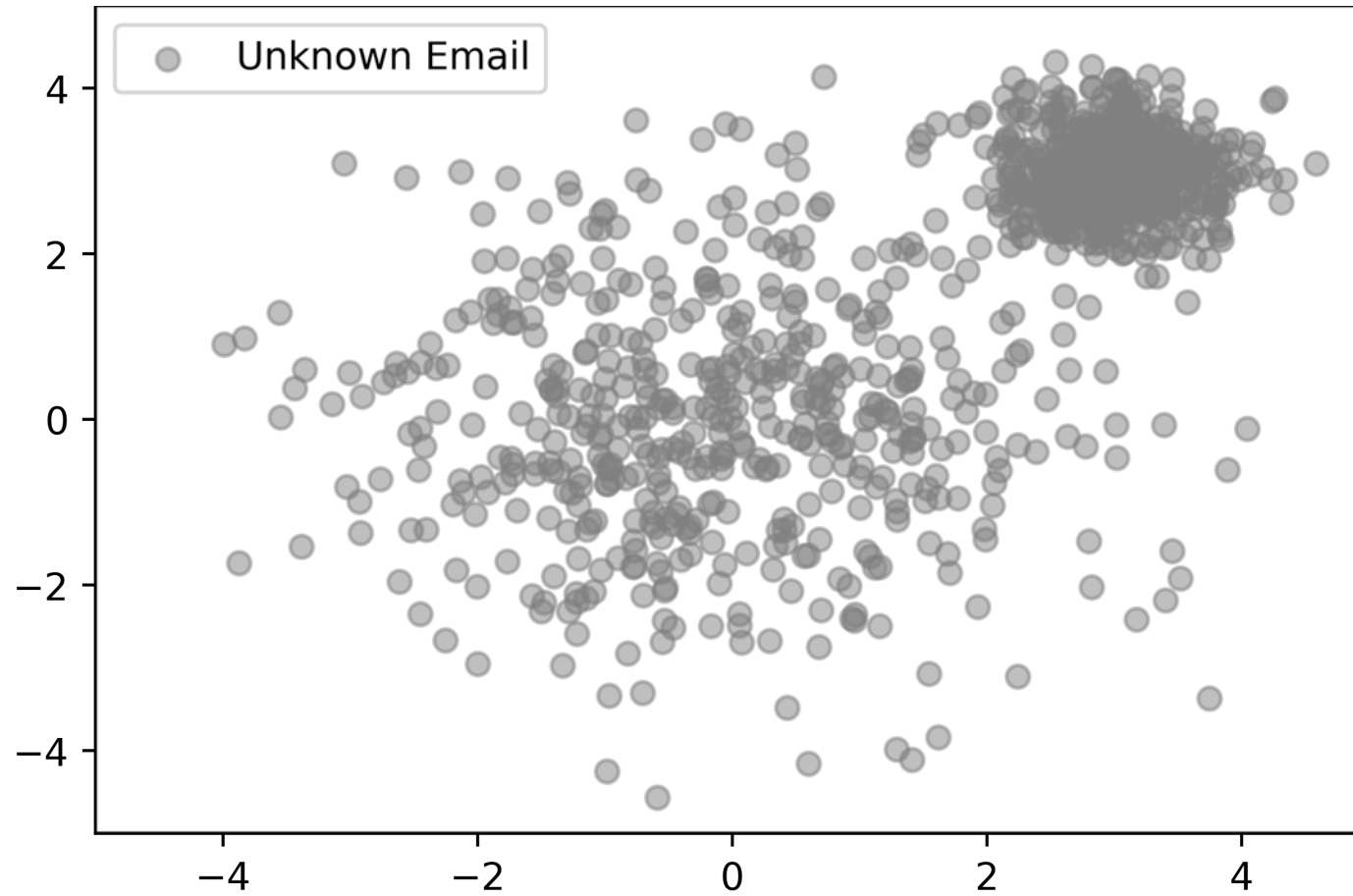
Supervised Learning

- Data

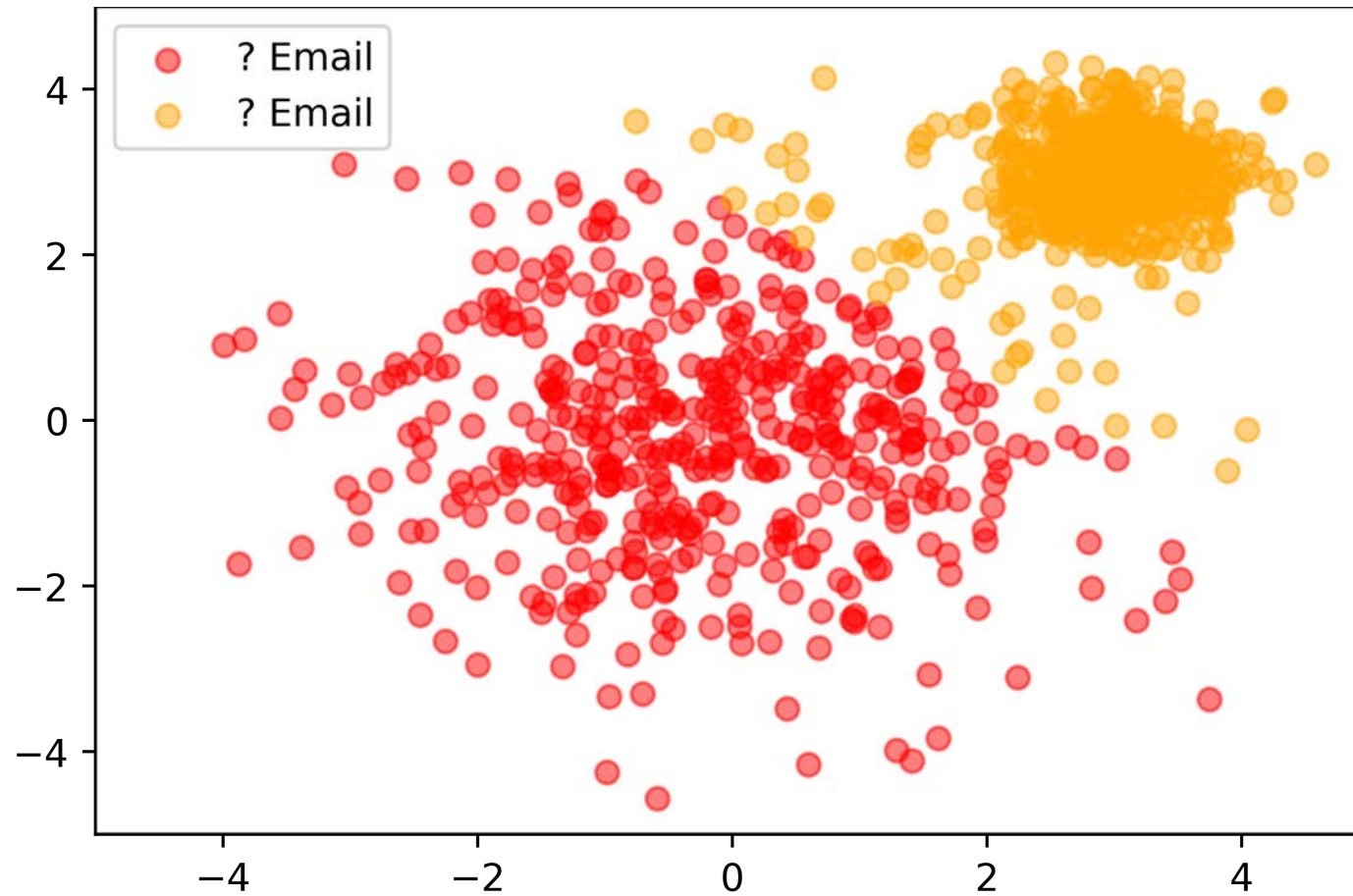


- Labels (Classes)
- Continues values

Unsupervised Learning

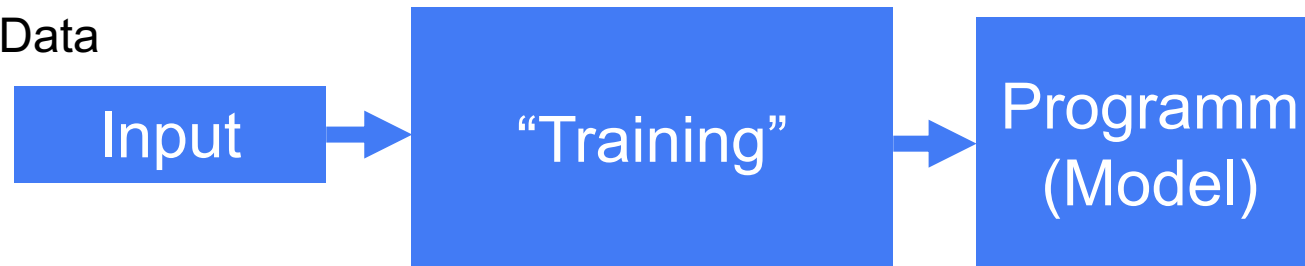


Unsupervised Learning



Unsupervised Learning

- Data



Not needed:

- Labels (Classes)
- Continues values

Learning Strategies

	Supervised Learning	Unsupervised Learning
Discrete	Classification or Categorization	Clustering
Continuous	Regression	Dimensionality reduction

Conclusion

Supervised vs. Unsupervised Learning

- Unsupervised Learning
 - Unlabeled data
 - Use to discover patterns and information
- Supervised Learning
 - Labeled data
 - Used to generalize known relations between input and output

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