Let’s Learn Some Machines

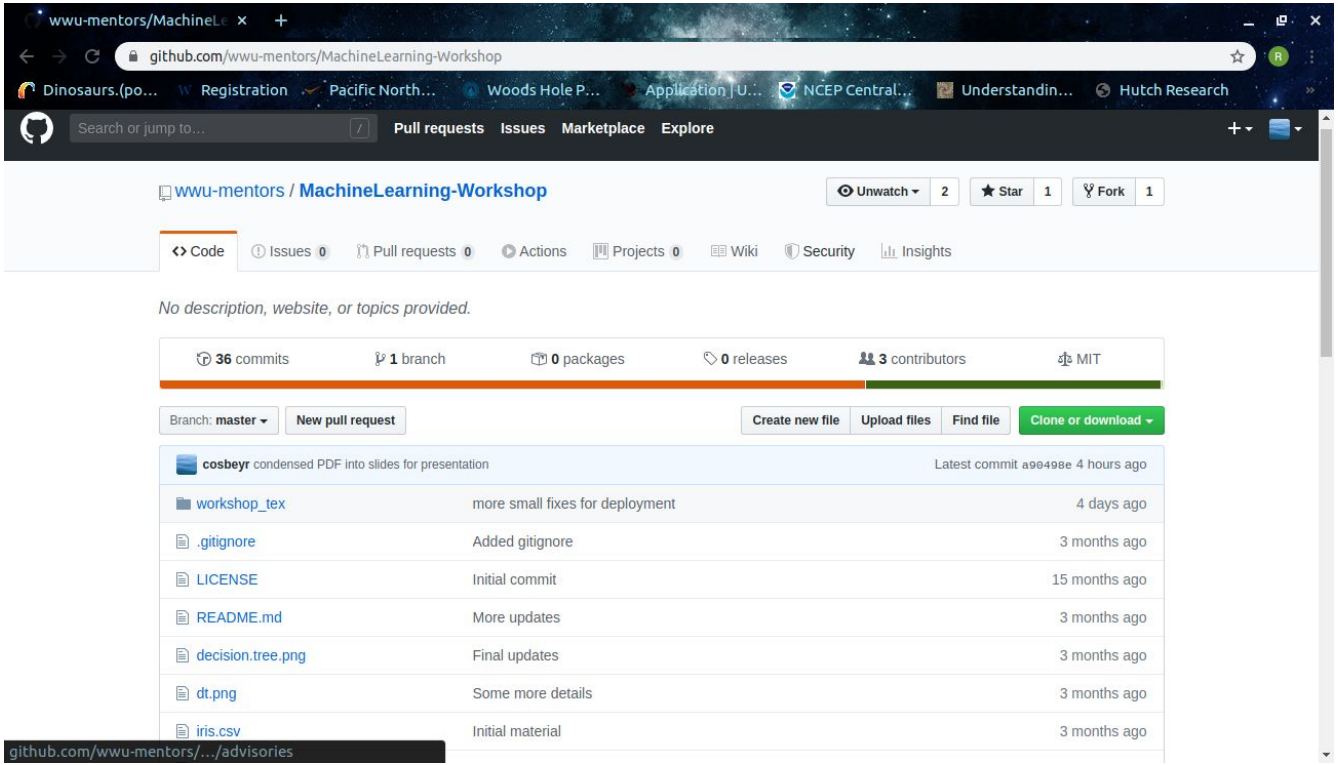
Josh Myers-Dean, Robin Cosbey

Let’s Learn Some Machines

Josh Myers-Dean, Robin Cosbey

```
> Name, pronouns
> Year in school
> Experience with machine learning
```

> Navigate to https://github.com/wwu-mentors/MachineLearning-Workshop



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> Clone the repository

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> Go into the repository directory

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cd MachineLearning-Workshop
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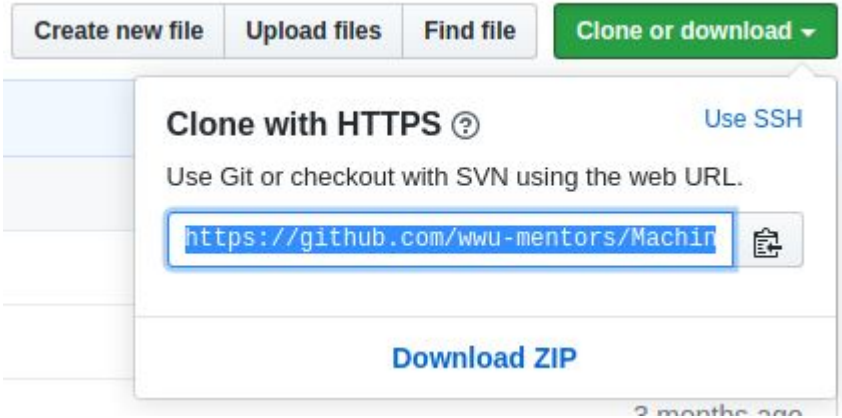

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> Run the setup.sh bash script

```
. setup.sh
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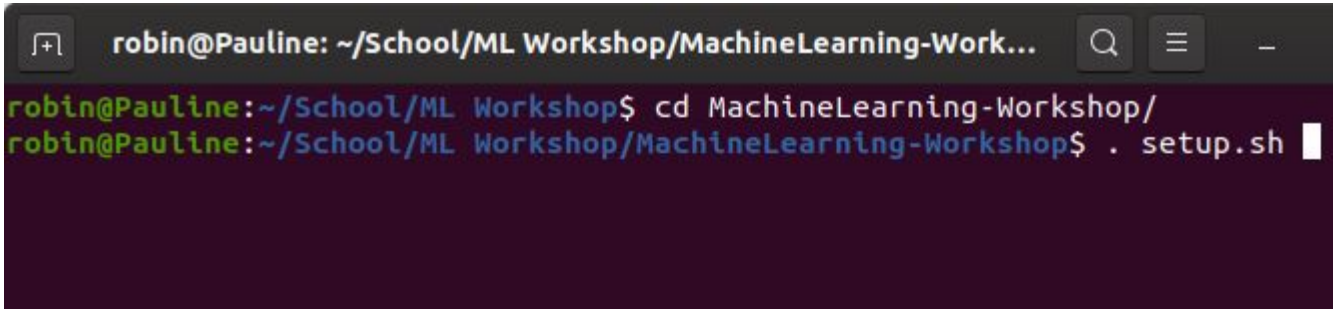

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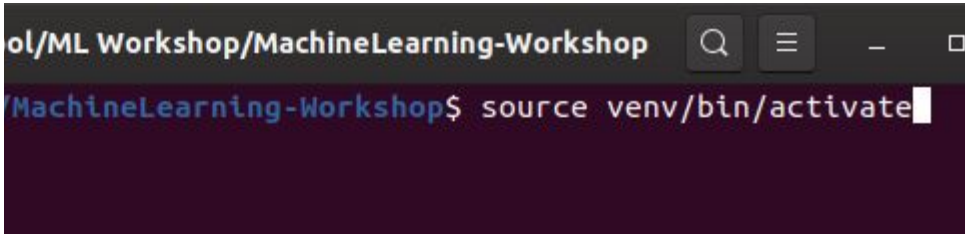
> Activate the virtual environment

```
source venv/bin/activate
```



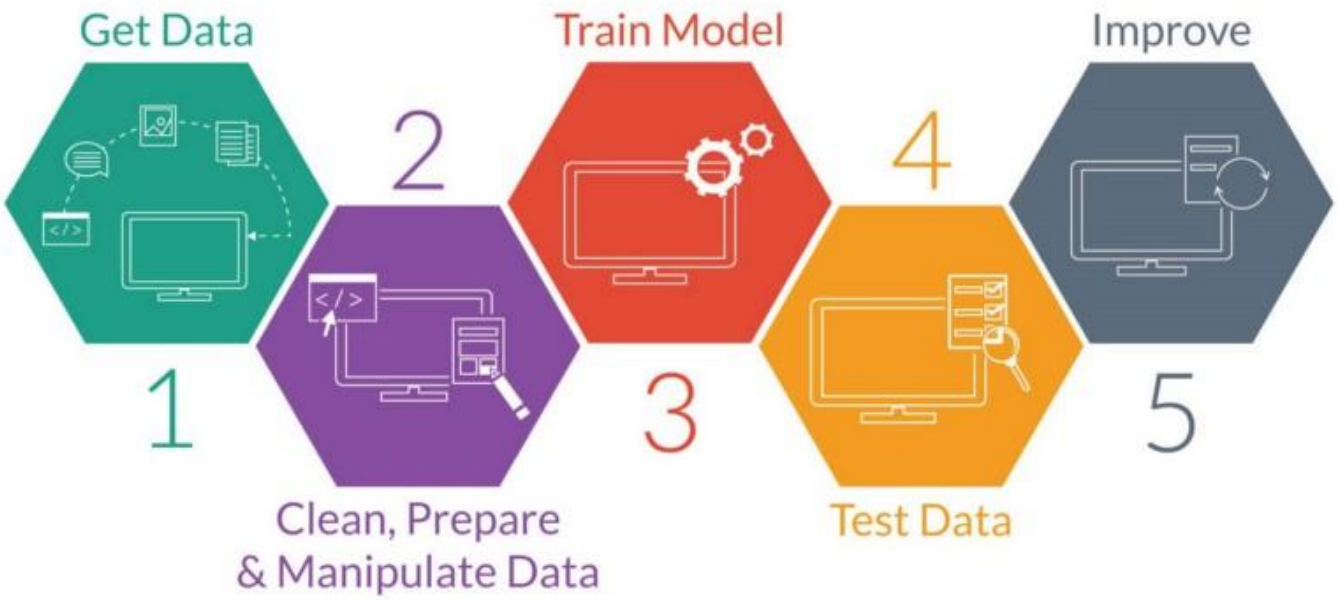
> Open the slides and/or pdf to follow along

```
evince ml_workshop.pdf &

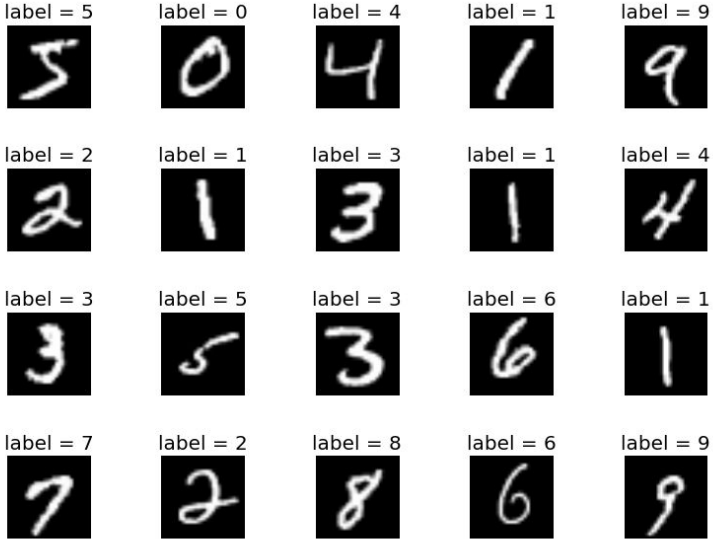
evince slides &
```

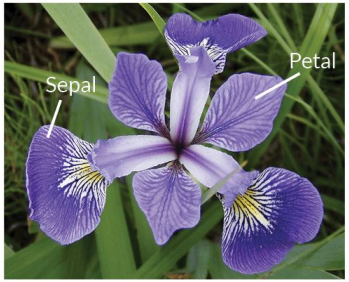
> Did you get lost along the way? Raise your hand, we are here to help!

Introduction



Data





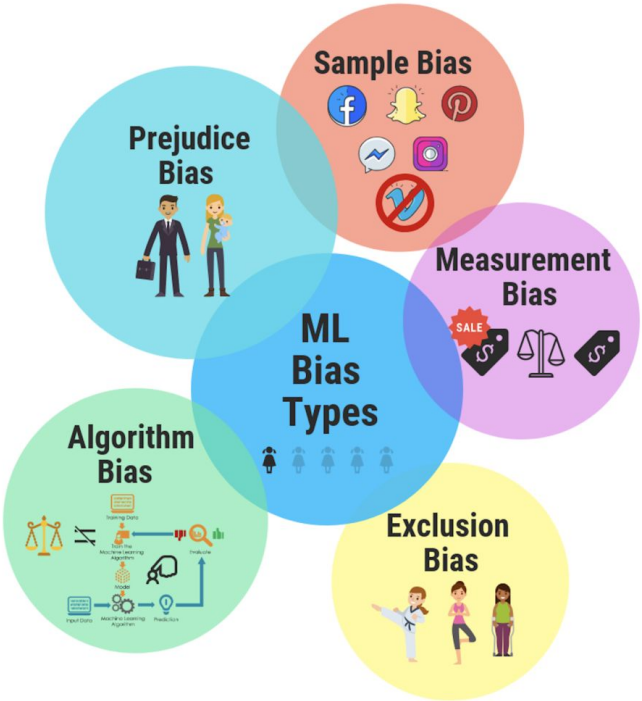
Iris Versicolor

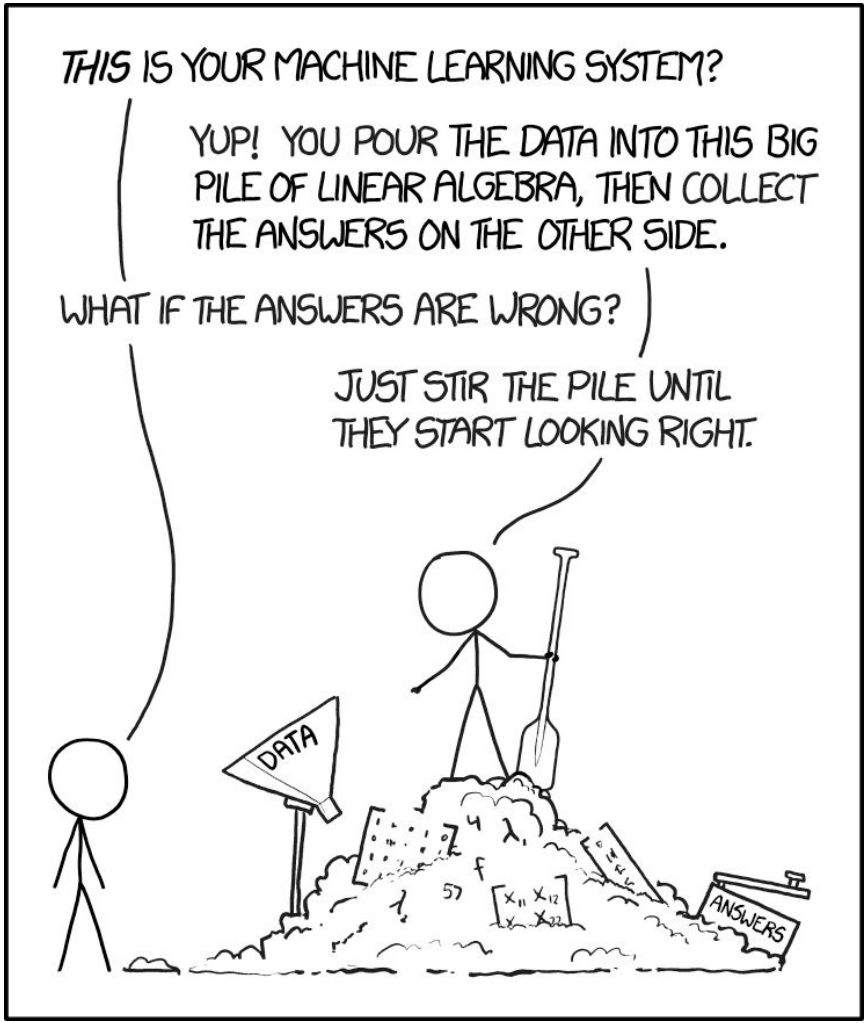
Iris Setosa

Iris Virginica

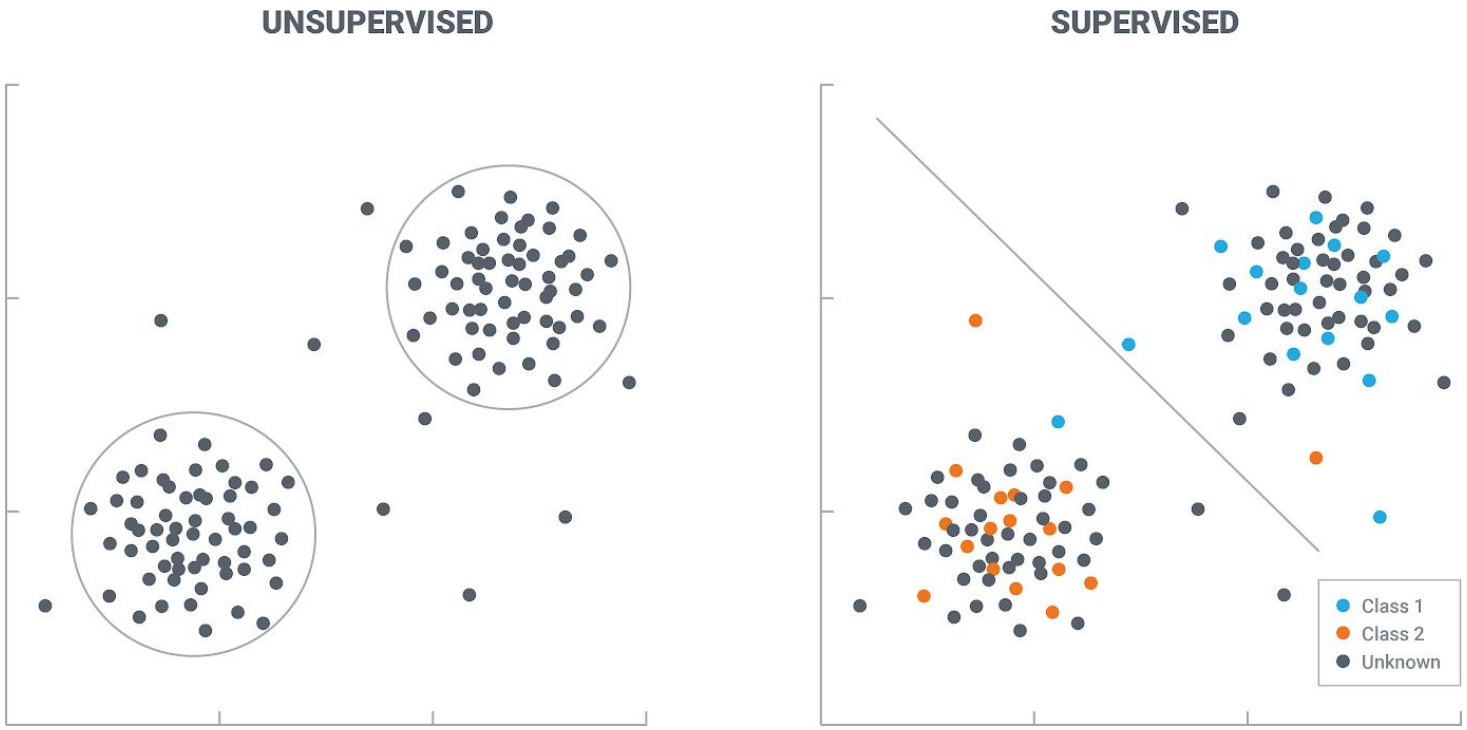
Iris	Sepal.L (a_1)	Sepal.W (a_2)	Petal.L (a_3)	Petal.W (a_4)	Class
u_1	5.5 cm	4.2 cm	1.4 cm	0.2 cm	Setosa
u_2	5.0 cm	3.4 cm	1.5 cm	0.2 cm	Setosa
u_3	6.1 cm	2.9 cm	4.7 cm	1.4 cm	Versicolor
u_4	6.2 cm	2.2 cm	4.5 cm	1.5 cm	Versicolor
u_5	6.3 cm	2.7 cm	4.9 cm	1.8 cm	Virginica
u_6	6.0 cm	2.2 cm	5.0 cm	1.5 cm	Virginica

Bias and Data

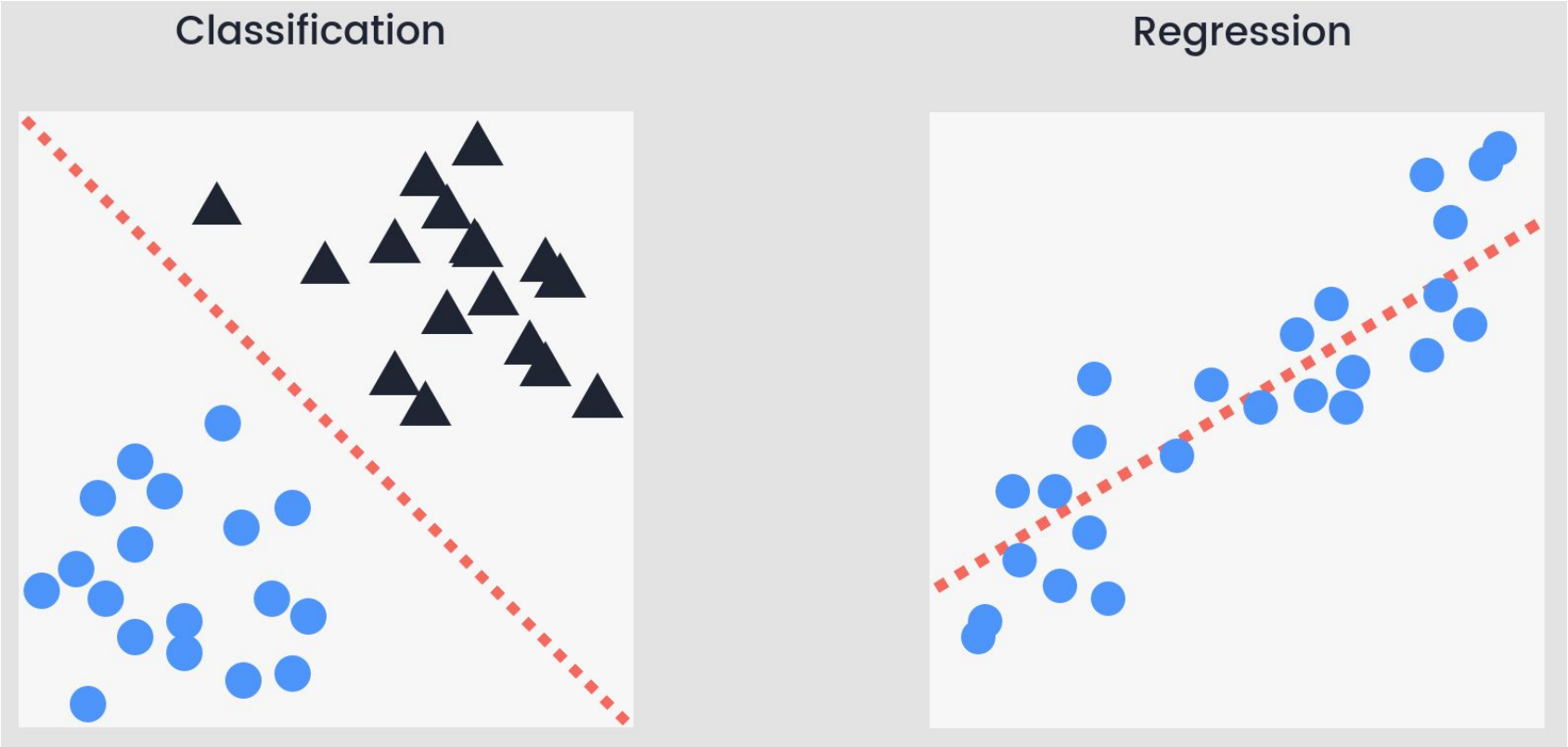




Unsupervised and Supervised Learning

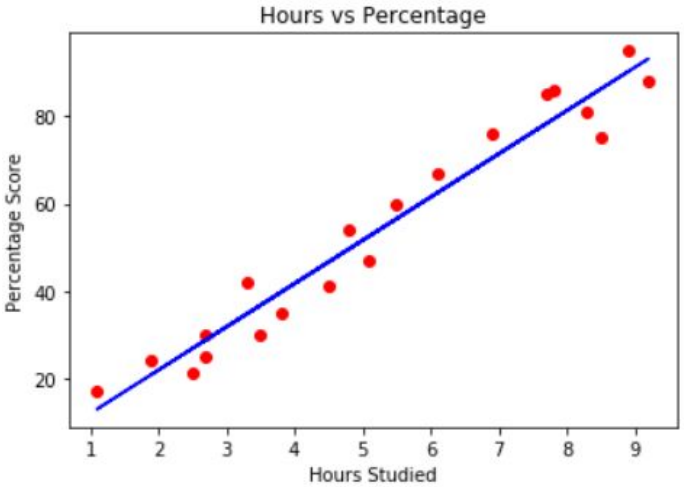


Supervised: Classification and Regression

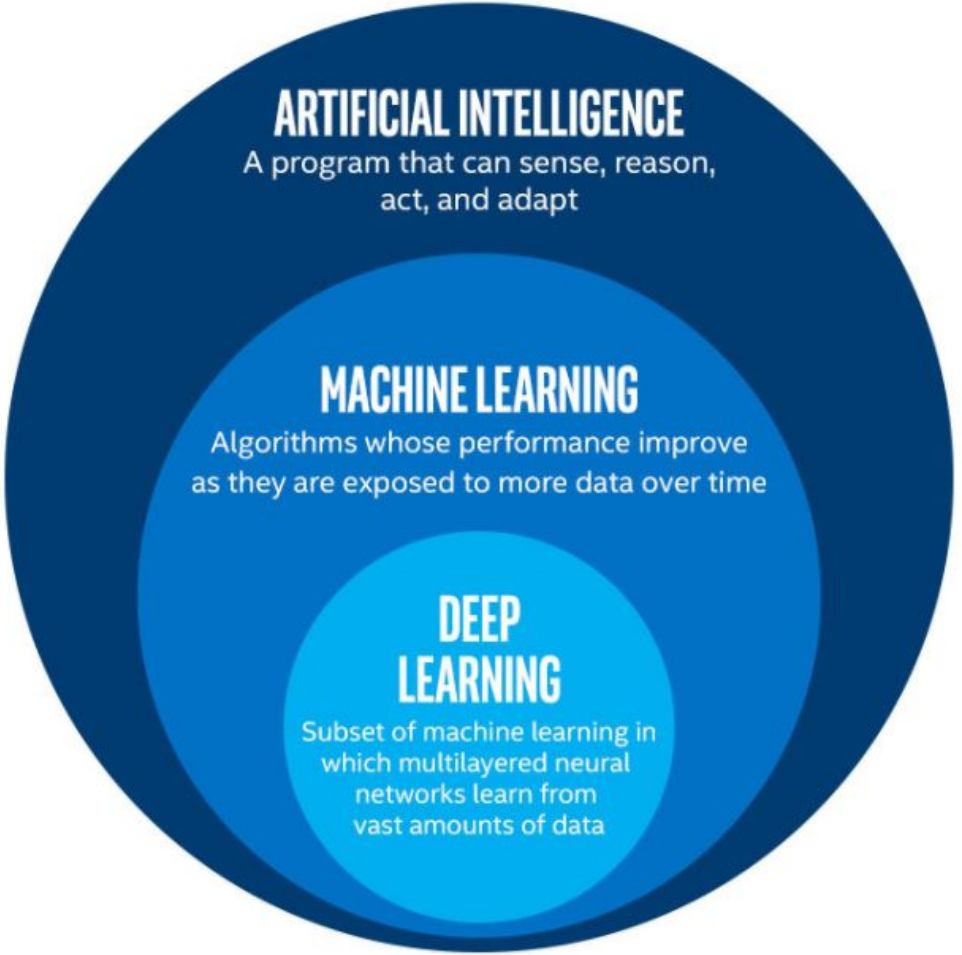


Classification

Regression



The Umbrella of AI



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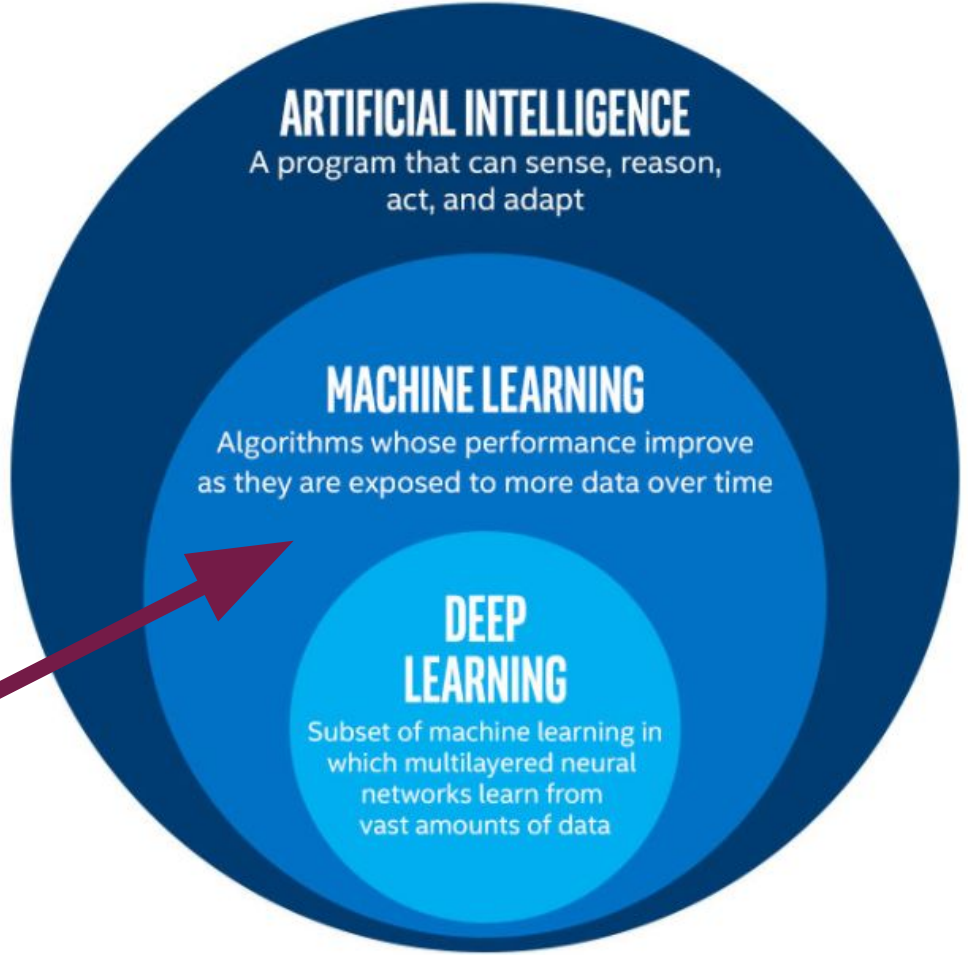
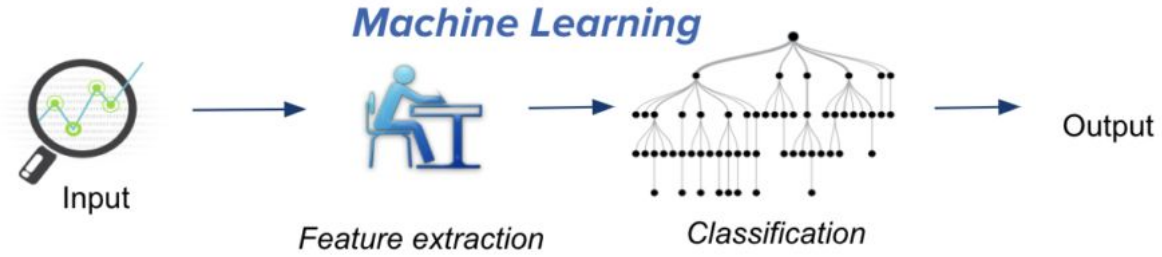
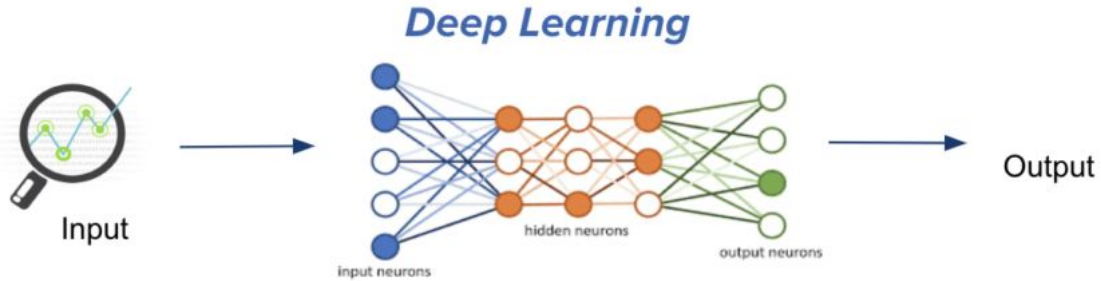


We are here

Machine Learning and Deep Learning



Traditional machine learning uses hand-crafted features, which is tedious and costly to develop.



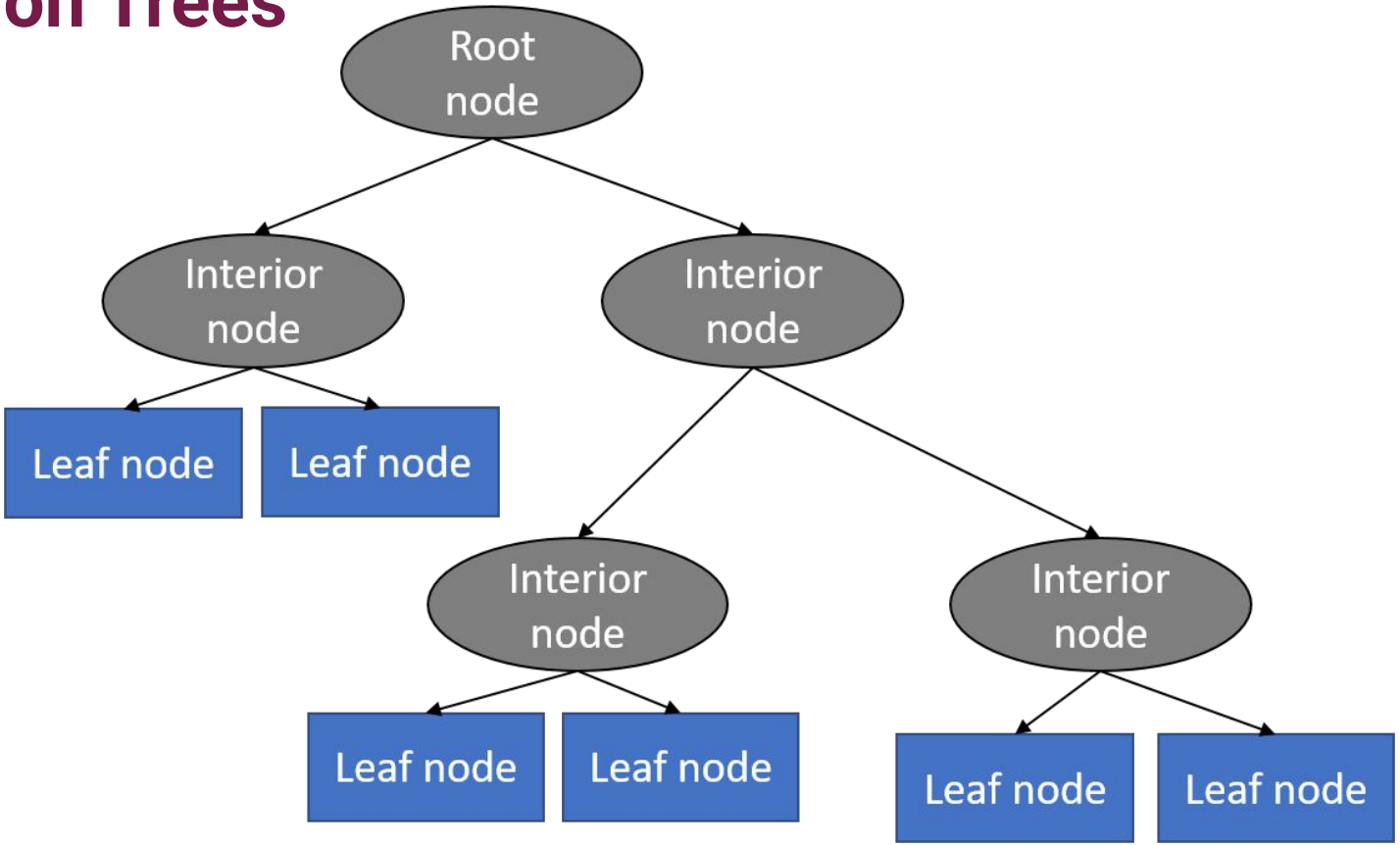
Neural Networks

Deep learning learns hierarchical representation from the data itself, and scales with more data.

Machine Learning and Deep Learning

	Machine Learning	Deep Learning
Layered?	Sometimes	Yes
Scalable?	Sometimes	Yes (context dependent)
Data?	Small-Medium	Large
Hardware?	Less intensive (CPU)	More intensive (GPU)
Training Time?	Shorter training time (more feature extraction)	Longer training time
Interpretability?	Completely	Very difficult!

ML: Decision Trees

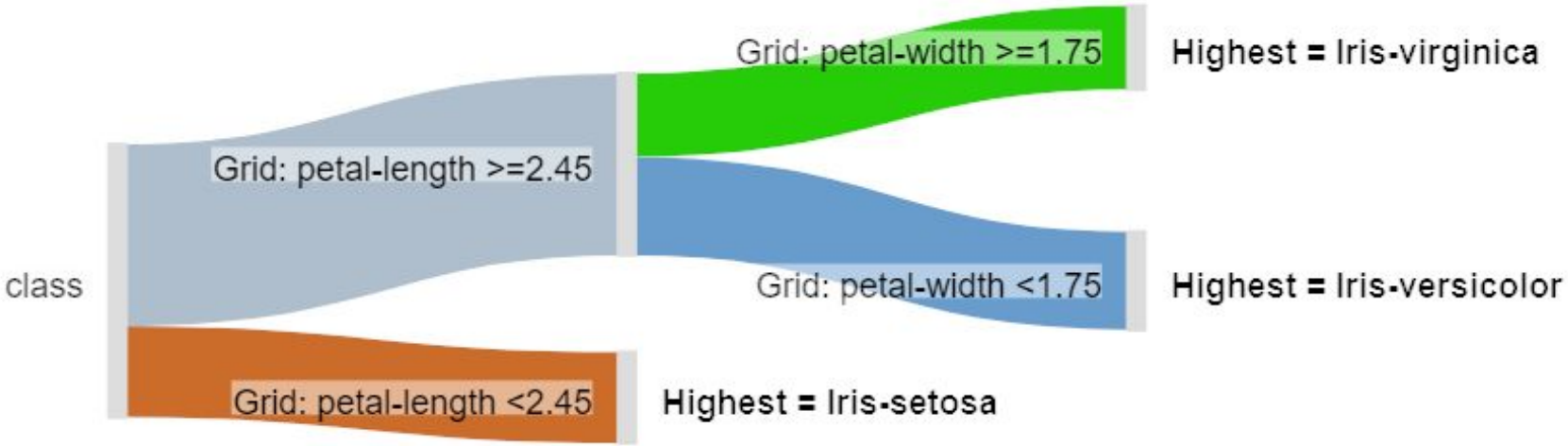


ML: Decision Trees
Iris Dataset

Iris Versicolor


Iris Setosa


Iris Virginica



Now let’s try it out!
But first: any **questions**?

> For more information about what we have covered as well as additional algorithms and approaches, check out **ml_workshop.pdf**