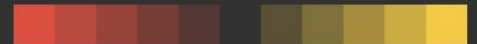# Machine Learning

Aliya Rysbek

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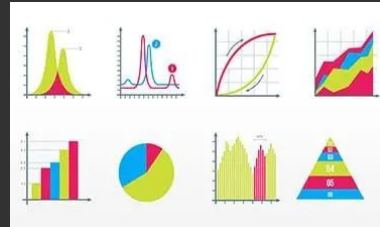Software Engineer @ Google DeepMind, London

Today we will

1. **Learn core terms:** ML vs DS vs AI, un/supervised learning, model, training vs inference, label vs feature, regression vs classification
2. **Your first machine learning model:** Jupyter notebook, Colab, predicting house prices
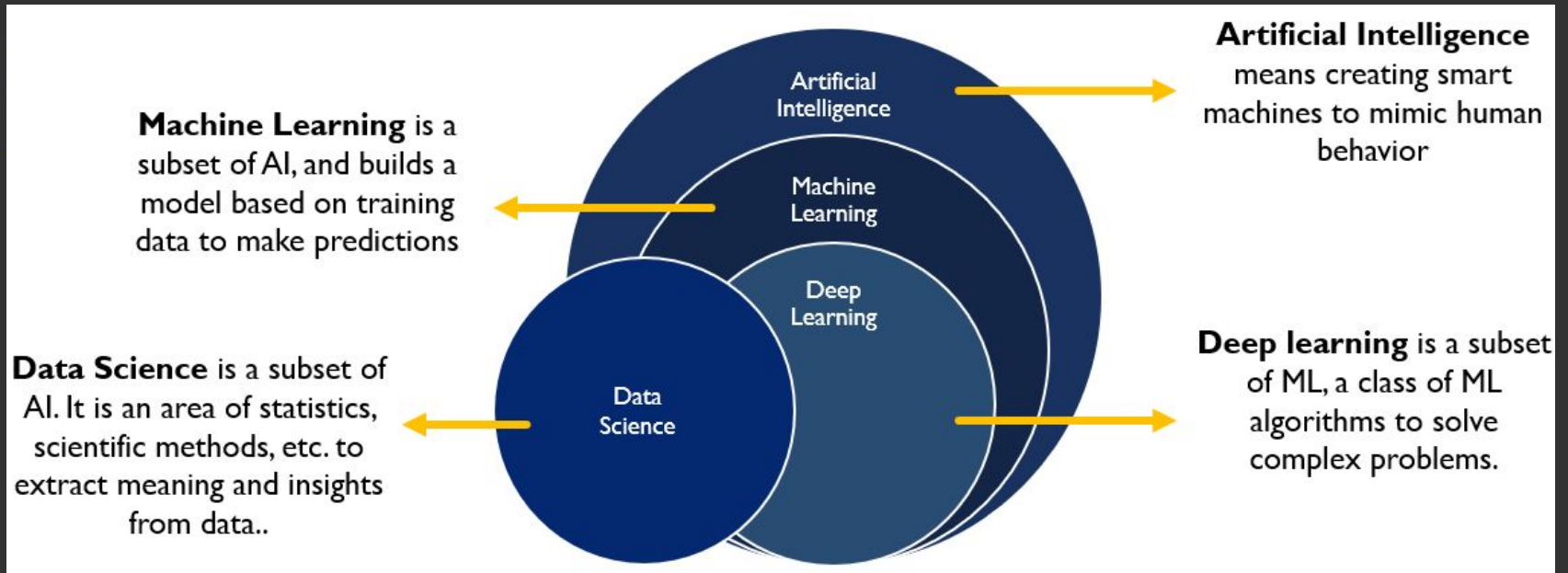
What is Machine Learning?

Arthur Samuel: "*Machine Learning algorithms enable the computers to learn from data, and even improve themselves, without being explicitly programmed*"

Predictions

Data

Statistics

+

=

ML vs Data Science vs AI

Machine Learning is a subset of AI, and builds a model based on training data to make predictions

Data Science is a subset of AI. It is an area of statistics, scientific methods, etc. to extract meaning and insights from data..

Artificial Intelligence means creating smart machines to mimic human behavior

Deep learning is a subset of ML, a class of ML algorithms to solve complex problems.

Artificial Intelligence

Machine Learning

Deep Learning

Data Science

Key ML terms

Label - thing we're predicting (y variable in simple linear regression): *price, spam etc*

Feature - data/input (x variable in simple linear regression): *area, sender's address etc*
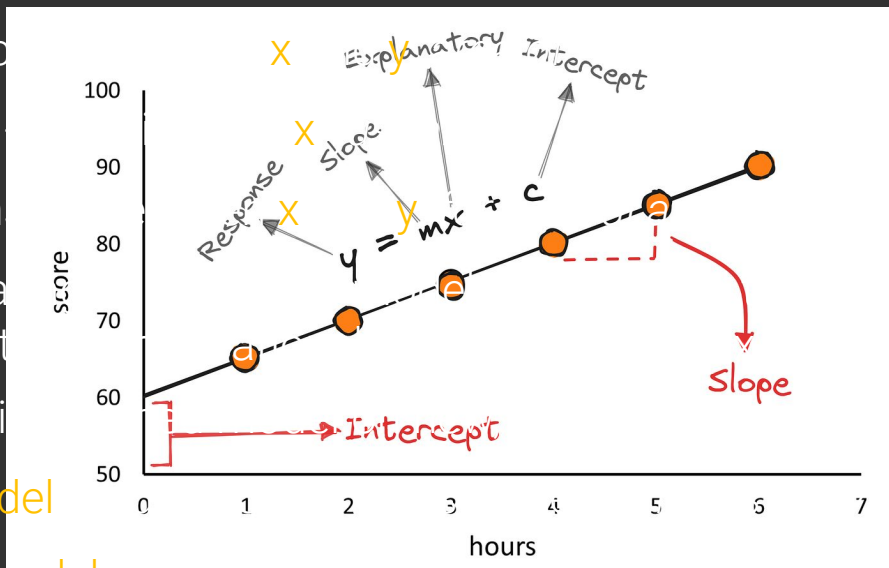
Labeled data - c

Unlabeled data - *you predict it)*

Model - relation *rice are higher than other*

   Training - crea del labeled data/x and apply statistics for it el/y.

   Inference - usi to make real predictions.

Regression model *ue of a house in California?*

Classification model predicts discrete values. *Is this email message spam or not spam?*

Build your ML model

kaggle.com/kernels/fork/1404276

colab.research.google.com

More tutorial: kaggle.com/learn/intro-to-machine-learning

Solution

```python
home_data.columns
y = home_data.SalePrice

feature_names = ['LotArea', 'YearBuilt', '1stFlrSF', '2ndFlrSF', 'FullBath',
'BedroomAbvGr','TotRmsAbvGrd']
X = home_data[feature_names]

print(X.describe())
print(X.head())

from sklearn.tree import DecisionTreeRegressor
iowa_model = DecisionTreeRegressor(random_state=1)
iowa_model.fit(X, y)

print(X.head())
print(iowa_model.predict(X.head()))
print(y.head())
```

You've learned

1. **Core terms:** ML vs DS vs AI, un/supervised learning, model, training vs inference, label vs feature, regression vs classification
2. **Trained your first machine learning model:** Jupyter notebook, Colab, predicting house prices