Azure Machine Learning

Knowledge Transfer Session
February 2017

BUSINESS CONSULTANTS

DEEP TECHNOLOGISTS

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AI, ML, and DL:
Artificial Intelligence, Machine Learning, and Deep Learning

- **Artificial Intelligence:**

AI refers to making a machine "smart" by getting it to act without being explicitly programmed to act. Essentially, it is human intelligence/behavior exhibited by a machine.

- **Machine Learning:**

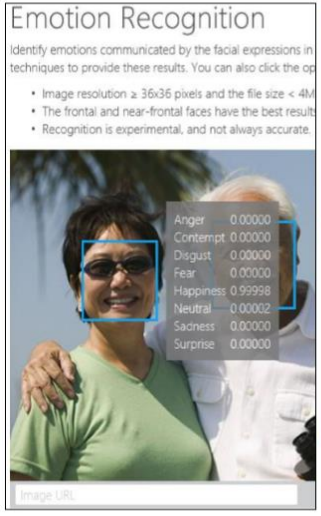
Machine Learning is a current application of AI based around the idea that we should really just be able to give machines access to data and let them learn for themselves.

- **Deep Learning:**

The subset of machine learning composed of algorithms that permit software to train itself to perform tasks, like speech and image recognition.

What is Machine Learning?

- Using known data to develop a model that predicts unknown data
  - Known Data: Big enough archive, previous observations, past data model: Known data + ML algorithms
  - Unknown Data: missing, unseen, non-existent, future data



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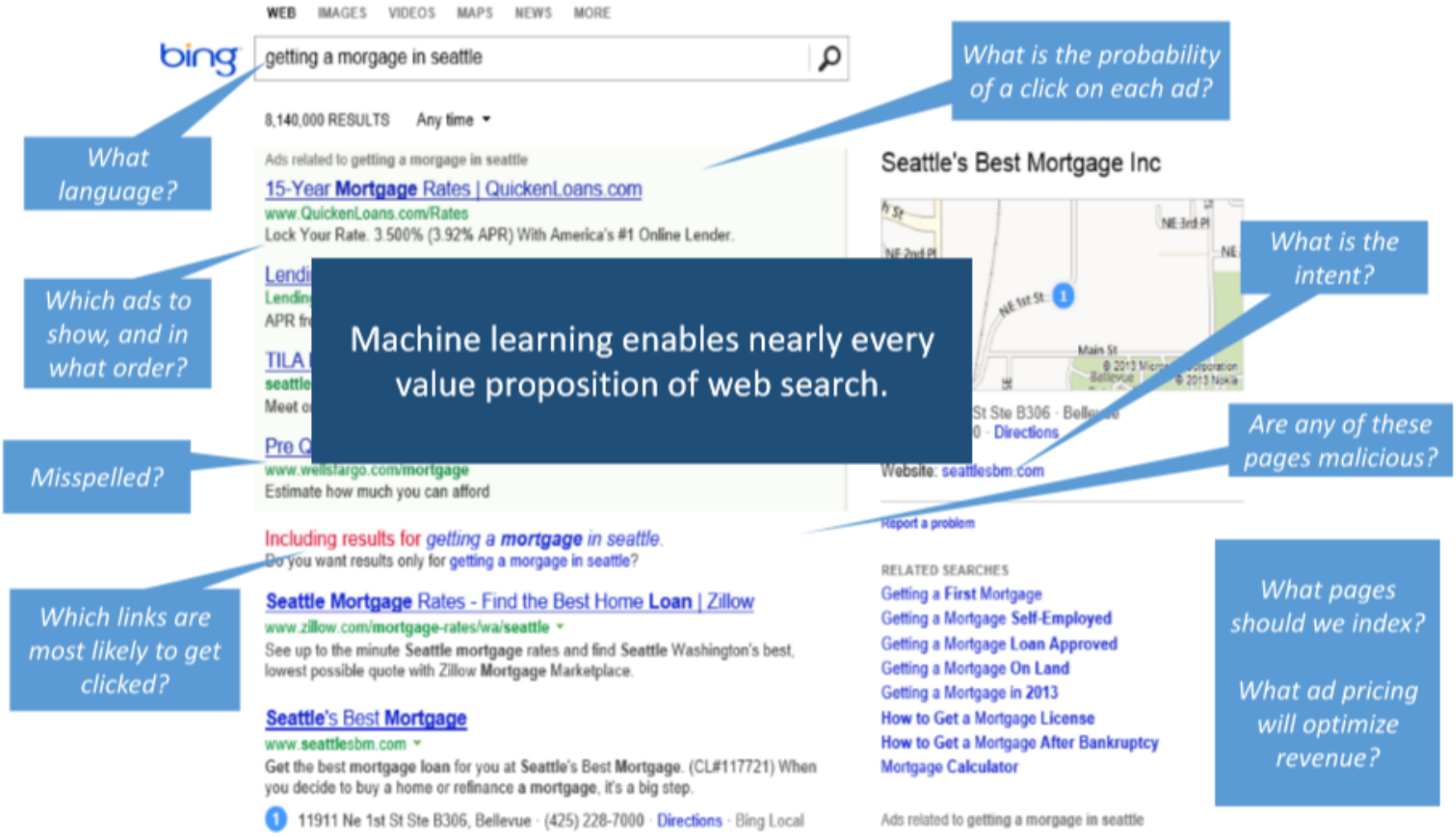
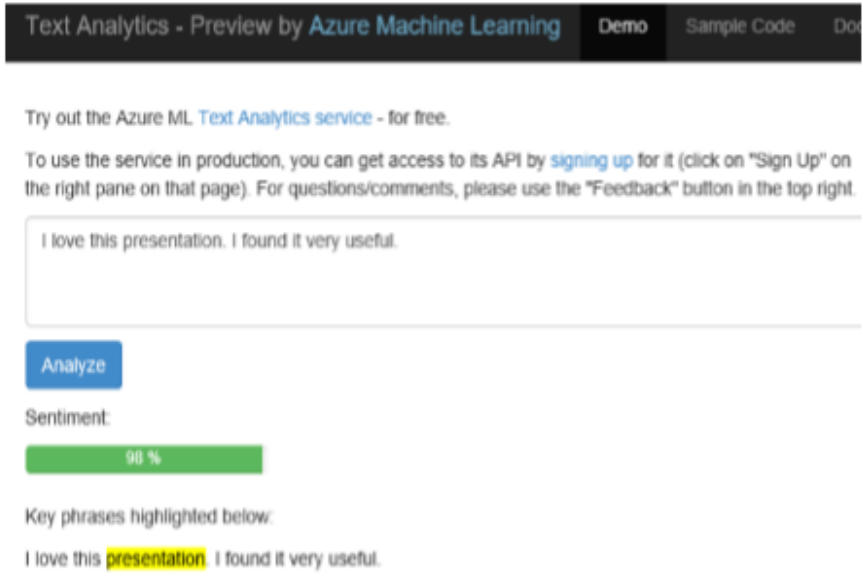
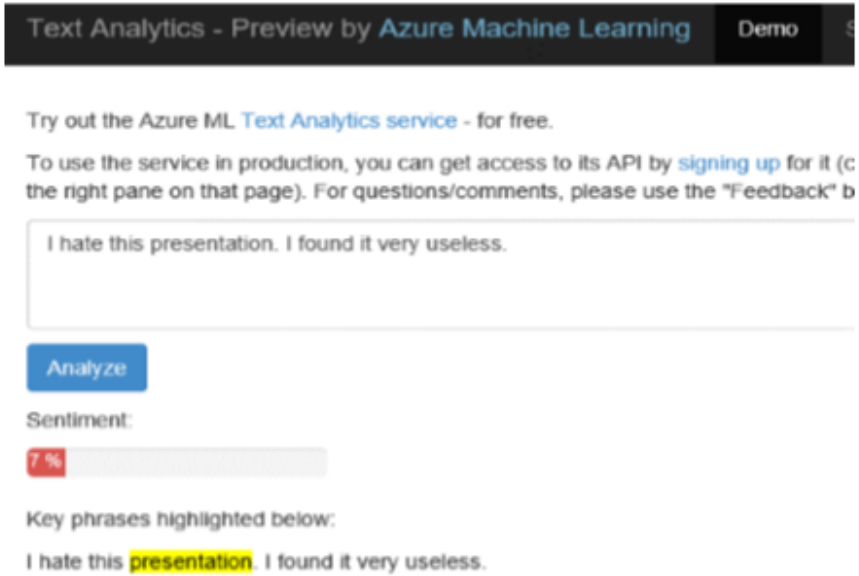


Text Analytics: User reviews

Positive



Negative



Types of Learning

Supervised Learning

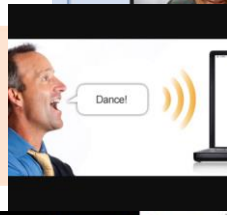
- Machine learns from labeled (known) data
- Each input has an output

Unsupervised Learning

- Discern any kind of structure present in data set
- No “labeled” information to assist

Semisupervised Learning

- Learn from both labeled/unlabeled data
- Useful when getting labeled data is expensive



Reinforcement Learning

- Action results in “reward”
- Inputs have positive or negative outcomes

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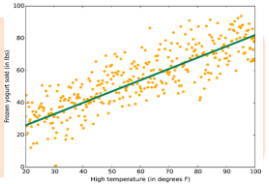
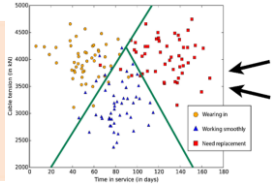
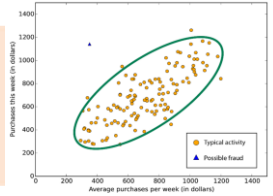
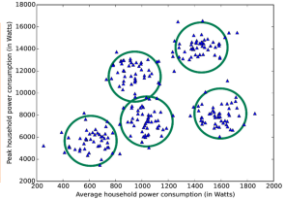
Common ML Algorithms

Regression	• Supervised Learning • Predicting a numerical value
Classification	• Supervised Learning • Answering a “yes or no” question
Anomaly Detection	• Supervised Learning • Finding something atypical, or unusual
Clustering	• Unsupervised Learning • Grouping similar data to find a pattern









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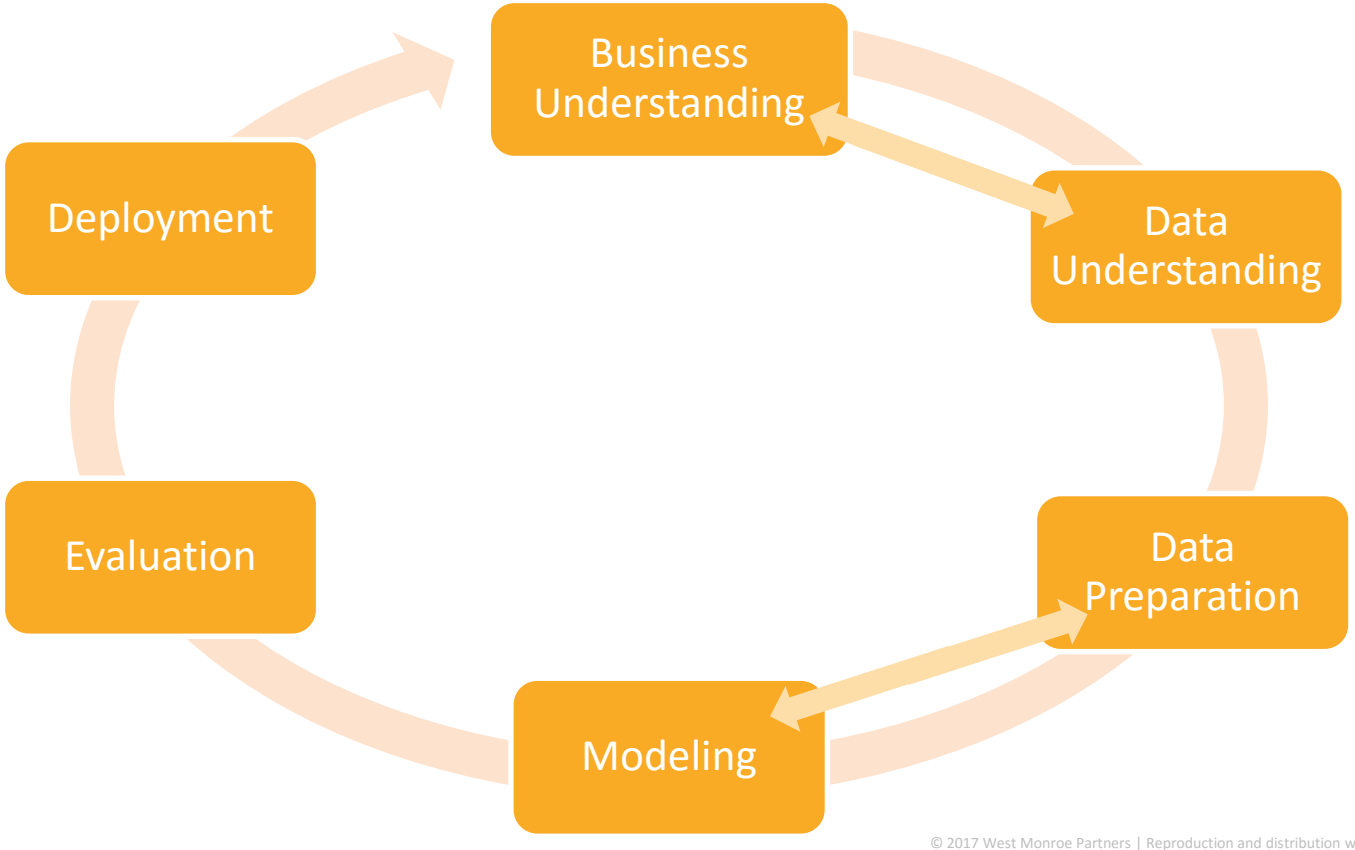
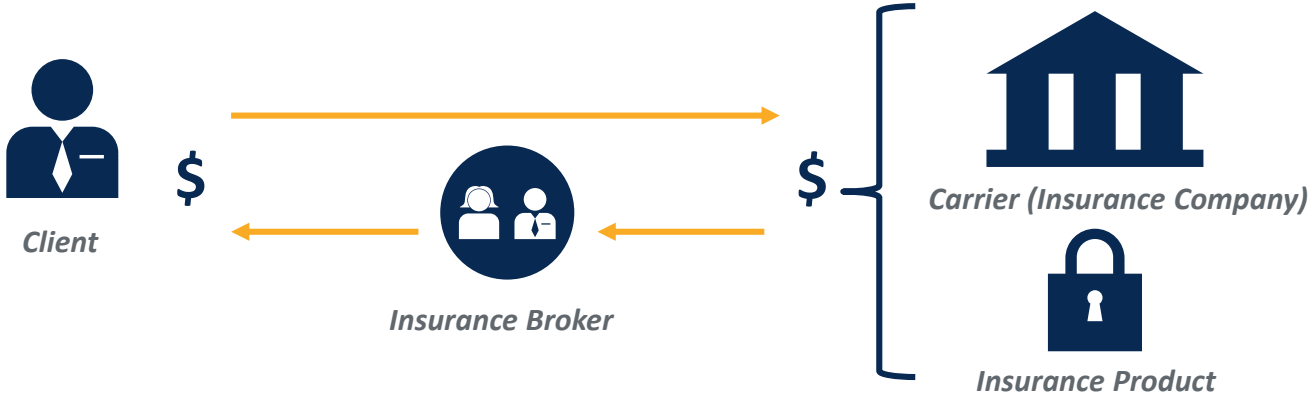
ML Project Life Cycle – CRISP-DM Model



WMP ML Project Example:

- Insurance Brokerage needs ML Model to predict insurance upsells
- Upsell: an additional insurance product sold to an existing client
- The Big Question: What additional products will a client buy, and how likely is the client to buy them?
- Why ML? Millions of products exist!



ML as a Service Platforms

- Microsoft Azure ML
- Amazon Machine Learning
- BigML
- DataRobot
- FICO
- Google Cloud ML
- IBM Watson
- PurePredictive
- Yottamine

Microsoft Azure Machine Learning

- Web based UI
- Shared ML workspace for easy collaboration/sharing
- Drag & drop for visual design/development
- Wide range of ML Algorithms available
- Extend with OSS R and/or Python scripts
- Share and document with IPython and/or Jupyter
- Deploy, publish, and scale rapidly using APIs

Microsoft Azure Machine Learning

Fully managed	Integrated	Flexible	Deploy in minutes
No software to install, no hardware to manage, all you need is an Azure subscription.	Drag, drop and connect interface. Data sources with just a drop down; run across any data.	Built-in collection of best of breed algorithms with no coding required. Drop in custom R or use popular CRAN packages.	Operationalize models as web services with a single click. Monetize in Machine Learning Marketplace.

Lab Time!

Next steps: What now?

- More labs available here:
  - https://github.com/melzoghbi/DataCamp
  - Material owner's blog: http://www.mostafaelzoghbi.com/
- Free material from Microsoft available on Virtual Academy
- Check out the sources on next slide

SOURCES

- http://www.mostafaelzoghbi.com/
- https://github.com/melzoghbi/DataCamp
- https://www.the-modeling-agency.com/crisp-dm.pdf
- http://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/#637b2f01687c
- https://blogs.nvidia.com/blog/2016/07/29/whats-difference-artificial-intelligence-machine-learning-deep-learning-ai/
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