



Fundamentals of Predictive Analytics

by Eric Siegel



Module 0. About the Course (10 min)

Module 1. Introduction (56 min)

- *Introduction to Predictive Analytics*
 - Predictive Analytics in Laymen's Terms
 - Predicting is Hard ...
 - But You Don't Need to be Very Good
 - The Success of Predictive Analytics
 - Predictive Analytics Defined
 - Learn from Organizational Experience
 - Working Definitions
 - Predictive Modeling
 - Simple Example
 - BI Hierarchy
 - Analytics Hierarchy
- *How It Works*
 - Build a Predictive Model
 - Apply the Model to Score a Customer
 - Deploy to Take Business Actions
 - Predictor: Building Blocks for Models
 - Training Data
 - Using Training Data
- *Decision Trees*
 - Introduction
 - Decision Tree Training
 - Decision Tree for Cross-Sell
- *Response Modeling*
 - Response Modeling for Direct Marketing
 - Scoring Each Customer
 - Campaign Profit Curve
 - Lift Chart
 - Lift Graph
- *Wrap-Up*

Module 2. Applications and Data Requirements (76 min)

- *Applications*
 - Optimizing Business Processes
 - Types of Business Decisions
 - Applications of Predictive Analytics
 - Modeling Other Types of "Customers"
 - Killer Online Applications
 - Targeted Retention
 - Growth = Acquisition - Defection
- *Attrition Modeling Examples*
 - Online Dating Service
 - Online Niche Retail Website
 - Telecommunications: Customers Churn
 - Consumer Banking: Likely Attriters Segment
- *Data Preparation*
 - Prediction Goal Drives Data Preparation



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- Customer Prediction Goal: Response
- Customer Prediction Goal: Attrition
- Customer Prediction Goal: Repeat Customers
- How Much Data Is Enough ?
- Types of Predictor Variables
- Linking External Data Resources
- *Wrap-Up*

Module 3. Predictive Modeling Methods (68 min)

- *More on Decision Trees*
 - “Growing” a Decision Tree
 - Decision Tree for Cross-Sell
 - Decision Tree Boundaries
 - Negative Cases are Good
 - Testing Data
 - Decision Tree Pruning
 - Decision Tree Example
 - Example Lift Curve
 - Ideal Lift Curve
- *Other Modeling Methods*
 - Naïve Bayes
 - Naïve Bayes’ Lift
 - Linear Regression
 - But It’s a Totally Non-linear World
 - Linear Decision Boundaries
 - Non-linear Transform: Sigmoid Unit
 - Neural Networks
 - Neural Network Decision Boundaries
 - TreeNet
- *Selecting the Best Method*
- *Methods Comparison*
- *Wrap-Up*

Module 4. Management and Deployment (63 min)

- *Project Management*
 - The “Bad” News
 - The Business Process
 - Why Tightly Collaborate?
 - CRISP-DM
 - Ways to Deploy a Predictive Model
 - Project Team
 - Predictive Modeling Software
- *Killer Application: Content Selection*
 - Learn More from AB Testing
 - Dynamic AB Selection
- *Case Study: Targeting Ads*
 - Selecting Sponsored Promotions
 - Examples of Ads
 - Stimulus Response: Training Data
 - Great Potential Gain



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- Univariate Models for One Ad
- Decision Tree
- Segment Examples
- Analytical Challenges
- Deployment
- Money-Making Model
- *Wrap-Up*

Module 5. Management and Deployment (63 min)

- *Affinium Model Demo*
- *Classification and Regression Trees Demo*
- *Additional Resources*