DA 320 Assignment 9 M. Blanco

# Part 1: Short Answers (use 3-5 lines to answer the following questions)

**Problem 1:** Define “machine learning” and discuss its role in the future of machine modeling.

Machine learning data analysis method that automates analytical model building. It is a branch of artificial intelligence based on the concept that systems can learn from data, identify patterns and make decisions with minimal human intervention. Machine learning plays an important role for its ability to quickly and automatically produce models that can analyze big and complex data and deliver faster, more accurate results. There are various unsupervised and supervised algorithms.

**Problem 2:** Define naïve Bayesian classifier and its role in data classification.

The Naive Bayes Classifier is a technique based on the Bayesian theorem and is particularly suited when the dimensionality of the inputs is high. Naive Bayes is known to outperform even highly sophisticated classification methods. This method can be used for real time prediction, multi class prediction, text classification (spam) analysis and recommendation system.

**Problem 3:** Explain what k-means clustering is and its role in the overall clustering concept.

K-means clustering is a type of unsupervised learning used on unlabeled data. The goal is to find groups in the data, with the number of groups represented by the variable K. The K-means clustering algorithm is used to find groups which have not been explicitly labeled in the data.

# Part 2: Research Analysis

**Problem 4:** Research machine learning further and compare **Machine Learning, Data Mining, and Statistics** side by side**,** including what it is, its properties, advantages/disadvantages, and a detailed real world example.

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| --- | --- | --- | --- |
|  | Machine Learning | Data Mining | Statistics |
| Properties | Automates analytical model building  Big 3:  Regression  Classification  Clustering  Related to computational statistics  Complex models and algorithm  Supervised/unsupervised learning | Process of discovering patterns in large data sets  CRISP-DM:  Business understanding  Data understanding  Data preparation  Modeling  Evaluation  Deployment  Tasks:  Anomaly detection  Association rule  Clustering  Classification  Regression  Summarization | Observability |
| Advantages | Used in variety of applications  Handle multi-dimensional and multi-variety data | Great analytical tool  Significant pattern generation  Flaw detection  Helps predict future trends  Help decision making | Can be analyzed relatively quickly  Information is collected in standardized way  Support qualitative data  Useful for benchmarking  Straightforward to analyze |
| Disadvantages | Getting relevant data  Data need to be processed (such as normalization)  Determining effectiveness can be challenging | Privacy issue  Expensive  Risk of misuse of information  Accuracy of data | Not an appropriate method to understand issues in great depth  Not an appropriate method to identify ways to solve problems  Time consuming |
| Real world examples | Churn analysis  Customer leads and conversion  Customer defection | Identify shopping patterns  Increase website optimization  Customer segmentation  Fraud detection | Sample mean, variance, standard deviation, quartiles, etc  Test statistics  Distribution  Estimation |

Machine Learning - Churn analysis

In a business context, it is important to detect which customers will soon abandon your brand or business. In this example, the goal is to determine who are the customers, how they behave, why are they churning, what can be done to prevent them churning, etc.

Data Mining – Customer Groups

In a business context, data mining models can help to determine customer response from marketing campaigns. It also helps determine customer groups (segments).

Statistics – Estimation

In a business context, a banker can use statists to estimate the number of people who will be making a deposit compared to the number of requesting a loan.

# Part 3: Case Study

**Problem 5:** Choose one case study from the following sites, analyze the case study and write a 2-3 pages summary (double space) in your own words.

Business Intelligence & Analytics Case Studies Across Industry

[https://www.techemergence.com/5-business-intelligence-analytics-case-studies-acrossindustry/](https://www.techemergence.com/5-business-intelligence-analytics-case-studies-across-industry/)

Examples of AI in Business Intelligence Applications

<https://www.techemergence.com/ai-in-business-intelligence-applications/>

Business Intelligence Best Practices- Case Studies <http://www.bi-bestpractices.com/case_studies/>

Companies are leveraging artificial intelligence and machine learning to create value for customers. Cognitive computing is a form of technology platform that combines machine learning, reasoning and natural language processing, speech, vision, and human-computer interaction.

The article goes over five case studies that demonstrate how artificial intelligence and machine learning technologies are being leveraged across various industries.

Case 1: Global Tech LED: Google Analytics Instant Activation of Remarketing

In this case, google analytics’ Smart List was used to identify prospective customer that would most likely purchase. This allowed Global Tech LED to provided target marketing campaigns. This led to five time more clicks than regular marketing campaign, increased website traffic, and optimize marketing.

Case 2: Under Armour: IBM Watson Cognitive Computing

In this case, IBM Watson was used in the “Cognitive Coaching System” app. This app serves as a personal health consultant, fitness trainer and assistant by providing users with evidence-based coaching on sleep, fitness, activity and nutrition. The app had very favorable ratings and contributed toward the company’s increase in revenue in 2016.

Case 3: Plexure (VMob): IoT and Azure Stream Analytics

In this case, Azure Stream was used by Plexure to help McDonald increase customer engagement in Netherland, Sweden, and Japan. Plexure was able to analyze the company’s data to detect customer behavior patterns and responses to special offers. Users of the McDonnal’s mobile app, received targeted content based on weather, location, time of day, and purchasing habits. This lead to an increase in customer offer redemption and increase sales for app users.

Case 4: Coca-Cola Amatil: Trax Retail Execution

In this case, Coca-Cola Amatil used Trax Retail Execution technology to take pictures of store shelves and upload to the cloud for analysis. This allowed sales rep able to receive reports with actionable insights within minutes. Coca-Cola Amatil saw an increased in market share. Store manager and sales rep were able to use the data to identify performance gaps and opportunities.

Case 5: Peter Glenn: AgilOne Advanced Analytics

In this case, Peter Glenn used AgilOne Analytics’ Dashboard to have a single customer view across all online and offline channel. The dashboard provided a feature to segment customers for target marketing. The company was able to launch integrated promotional, triggered and lifecycle campaigns to increase sales and in-store traffic during non-peak months.

References:

https://static.googleusercontent.com/media/www.google.com/en/us/analytics/customers/pdfs/global-tech-led.pdf

http://techportfolio.net/2016/05/under-armour-leverages-ibms-watson-to-challenge-fitbit/

https://www.traxretail.com/wp-content/uploads/2015/08/TRE\_Customer-Success.pdf?submissionGuid=3c738a7d-1f3d-4cab-ae86-aee7ad53086d

https://cdn2.hubspot.net/hubfs/1809737/Peter%20Glenn/Peter\_Glenn\_Case\_Study\_102016-1.pdf