01076532: ML

Machine Learning

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Grading Policy

• Class Activity	20
• Lab (4)	30
• Assignment	20
• Final Exam	30

Class Activity & Lab

- ให้นศ.จับกลุ่ม 2 คน โพสข้อมูลกลุ่มเข้ามาในเฟสกรุ๊ป
  - 1. ชื่อกลุ่ม
  - 2. รูปภาพสัญลักษณ์ประจำกลุ่ม
  - 3. รายชื่อสมาชิก และ รหัสนศ.
    - ปล. 1 กลุ่มนี้จะเป็นกลุ่มทำ class activity และ Lab ทุกครั้ง
    - ปล. 2 ห้ามใช้ชื่อหรือชื่อเล่น เป็นชื่อกลุ่ม

- Class Activity
  - นำ Notebook / Tablet มาด้วยทุกครั้ง
  - บางครั้งอาจต้องใช้ Excel ช่วยคำนวณ เพื่อให้เห็นค่าได้เร็ว
- Lab
  - นำ Notebook มาด้วยทุกครั้ง
  - ภาษาที่ใช้เป็น Python
  - Open dataset (สามารถเลือกข้อมูลทดลองจากแหล่งอื่นนอกเหนือจากที่ให้ได้)

Topics

- **Introduction to Machine Learning**
- **Data Exploration and Visualization**
- **Feature selection**
- **Regression Models for Prediction (Single and Multiplevariable Linear Regression, SVM regression)**
- **Classification Models (Logistic Regression, SVM classification, Deep Learning)**
- **Clustering Analysis**
- **Recommendation System (Association Analysis)**

Intro to ML

- What would be the meanings of ML?

Intro to ML

- What would be the meanings of ML?
  - 1950: Arthur Samuel described it as:
    - "the field of study that gives computers the ability to learn without being explicitly programmed."
    - This is an older, informal definition.

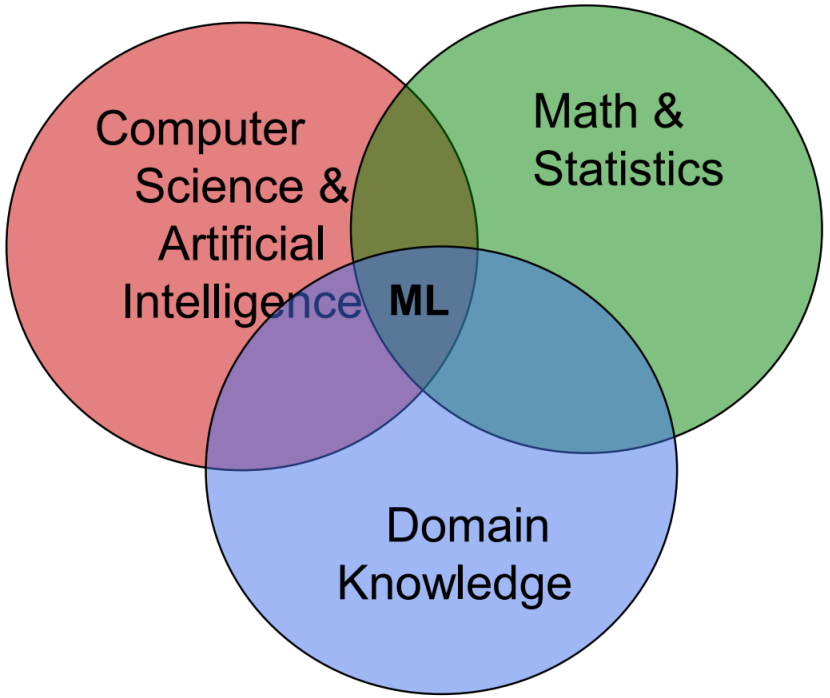
  - Tom Mitchell provides a more modern definition:
    - "A computer program is said to learn from
      - experience E with respect to
      - some class of tasks T and
      - performance measure P,

Intro to ML

- Can you recognize ML applications around you?
  - Biometric:
  - Robotic:
  - Media:
  - Banking:
  - Marketing:
  - Network security:

Machine Learning Overview

- learning from data
- no explicit programming
- discovering hidden patterns
- data-driven decisions



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Categories of Machine Learning Techniques

- Regression (Numerical Value Prediction)
- Classification (Category Prediction)
- Cluster Analysis (Organizing Group)
- Association Analysis (Relationship Analysis)

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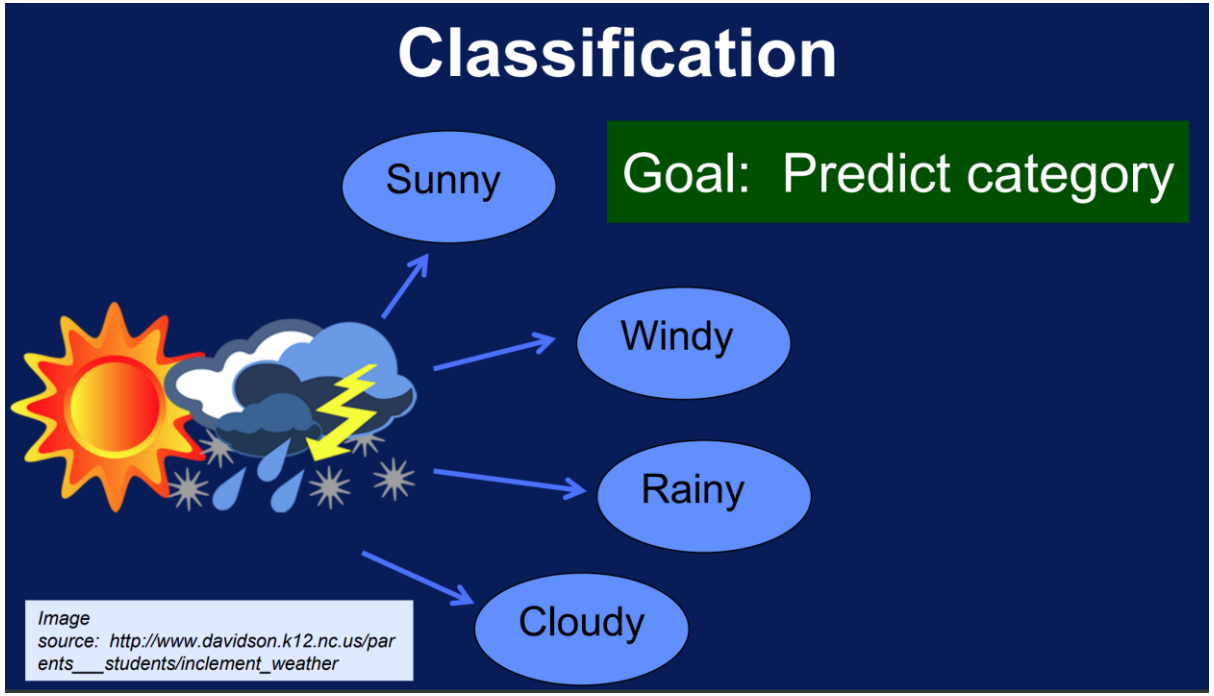

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Categories of Machine Learning Techniques

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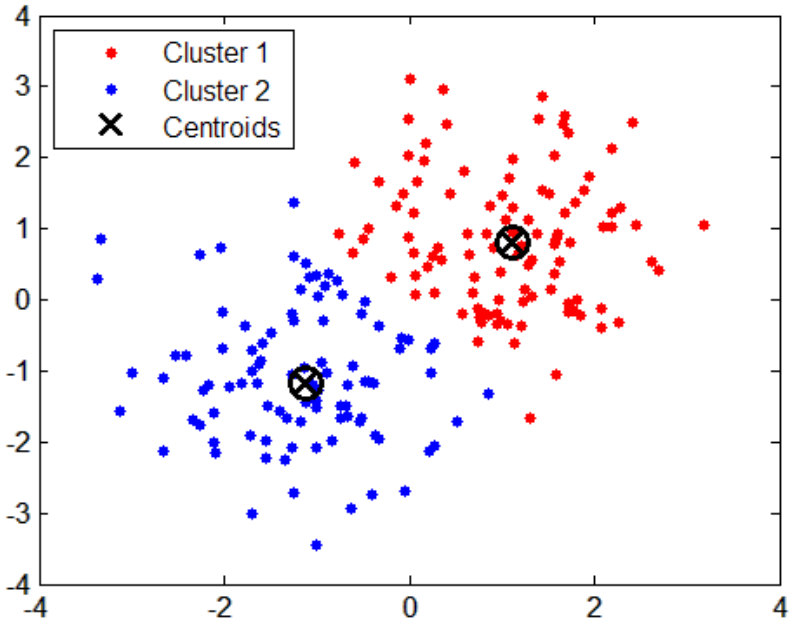
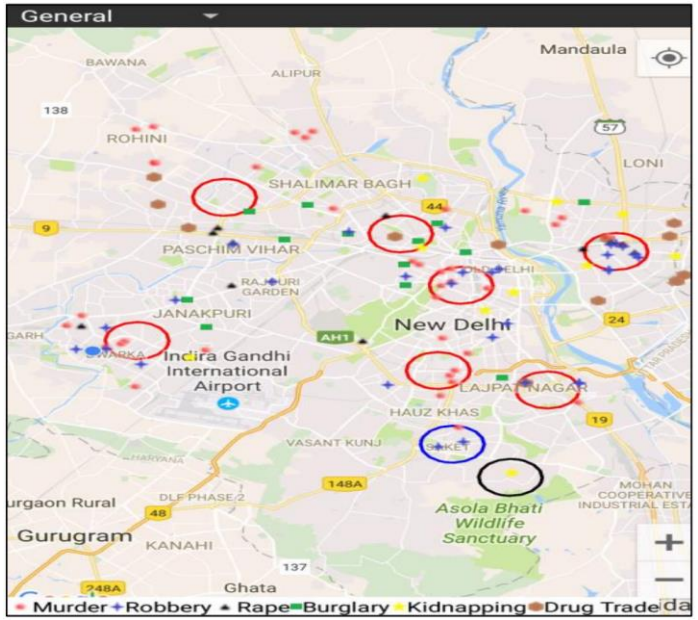


Document Clustering

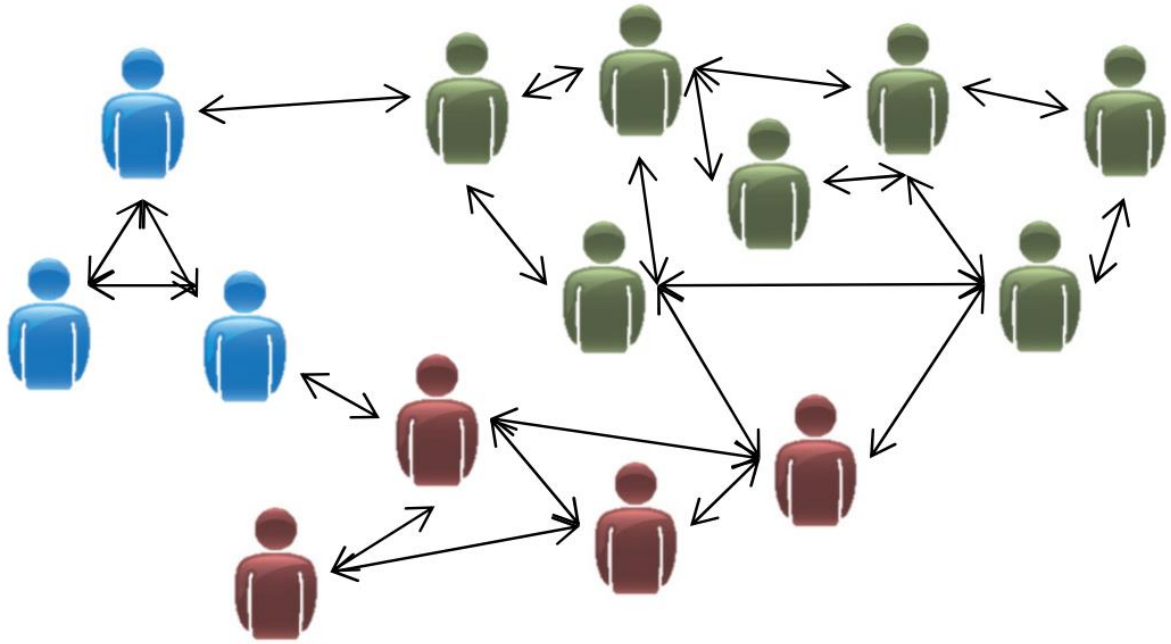


Crime Area Clustering

Mail Clustering

Categories of Machine Learning Techniques

- Association Analysis (Relationship Analysis)

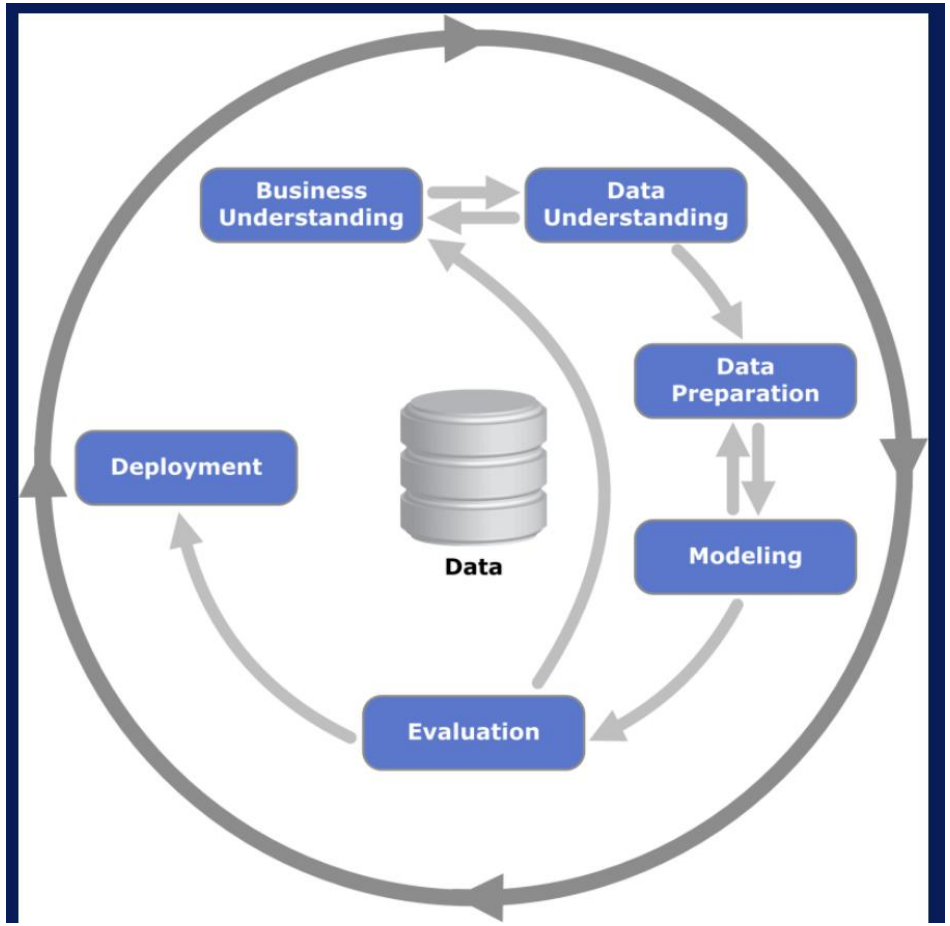


Social network analysis

Standford U.(Andrew Ng) : https://www.coursera.org/learn/machine-learning/home/welcome

Machine Learning Process

CRISP-DM CRoss Industry Standard Process for Data Mining



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Machine Learning Process

- Application specification
- Data Acquisition:
- Data Exploration
- Data Analysis
- Result Visualize and Report
- Apply Result to Applications

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Machine Learning Process

- Application specification
  - Business Understanding
  - Formulate goals

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Machine Learning Process

- Data Acquisition:
  - Identify data sources
  - Collect data / Integrate data
    - Self collection
    - Open Dataset
      - Sometimes preprocessed
      - No preprocessing info

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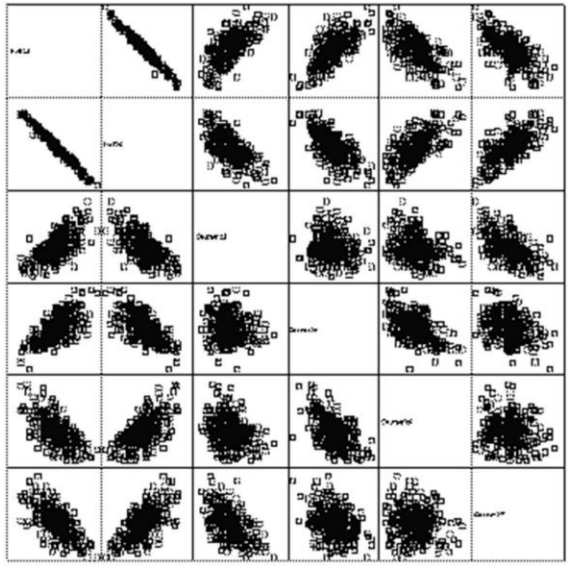
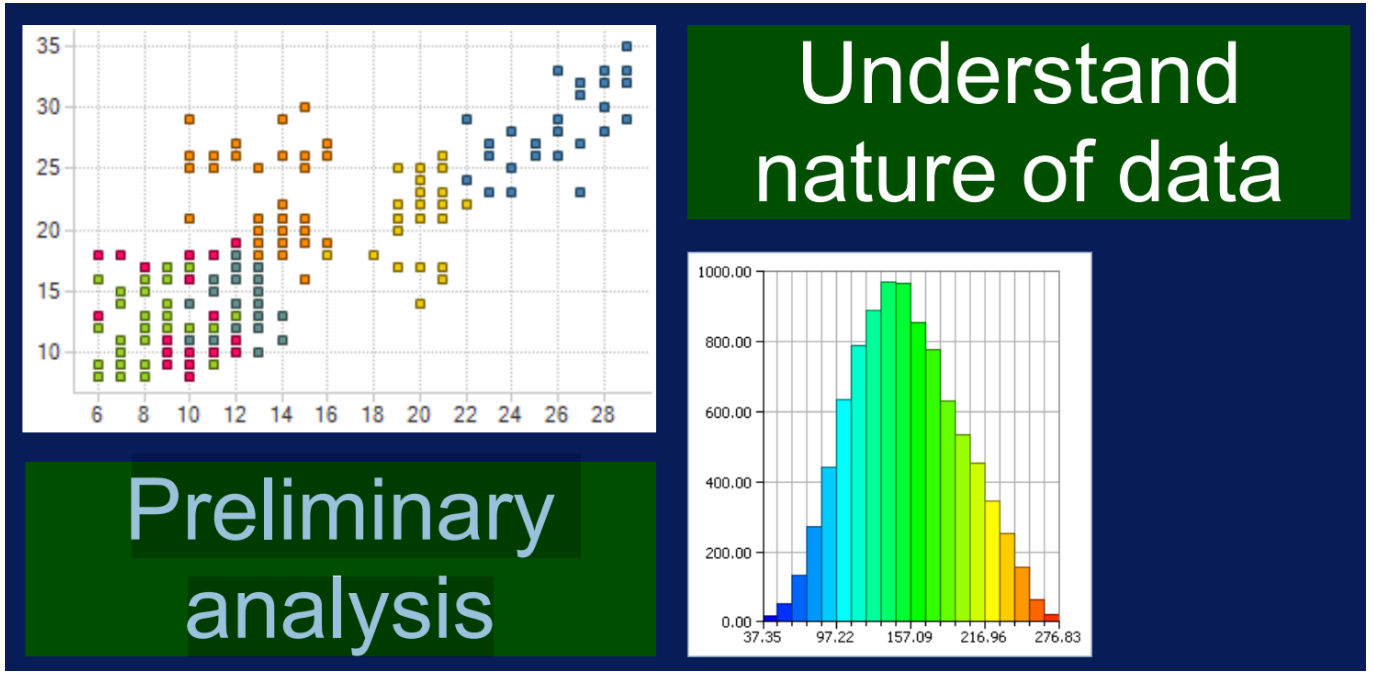
Machine Learning Process

- Data Exploration (Visualization)





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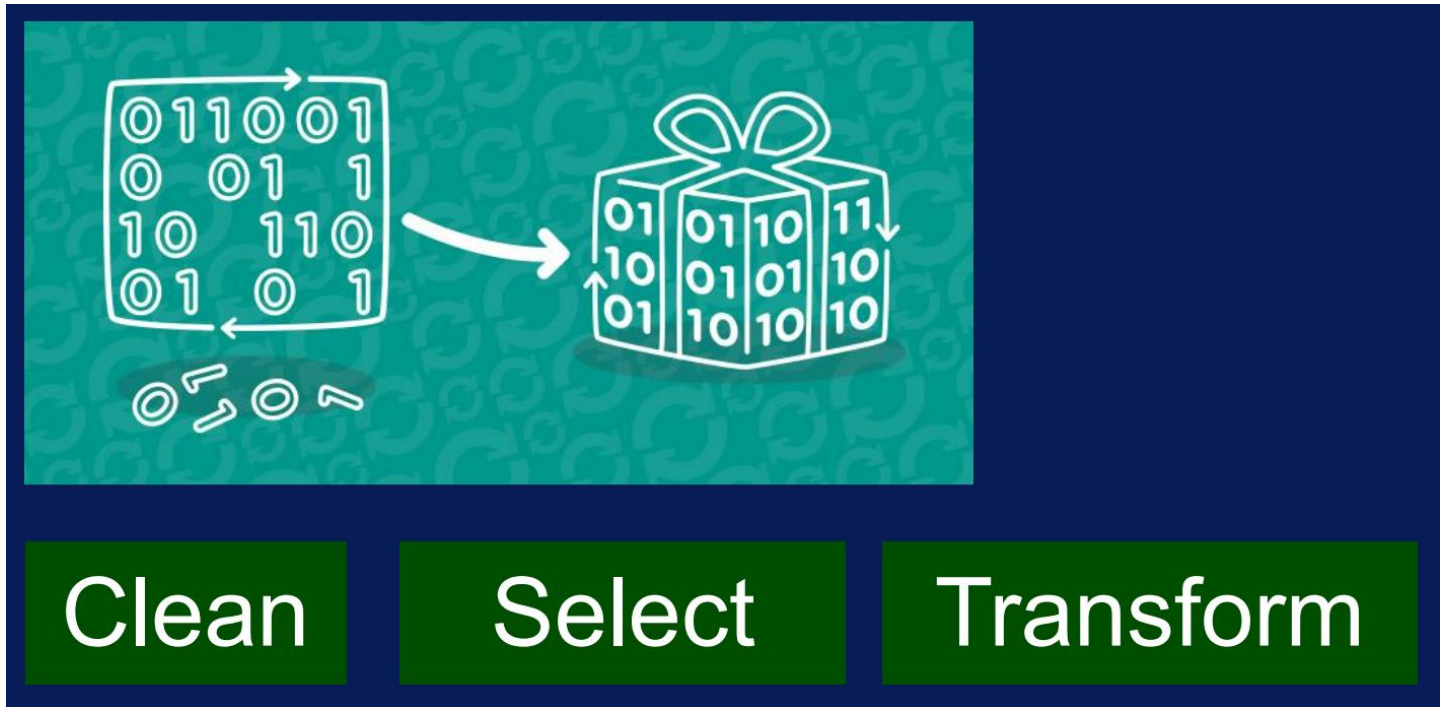
Machine Learning Process

- Data Exploration



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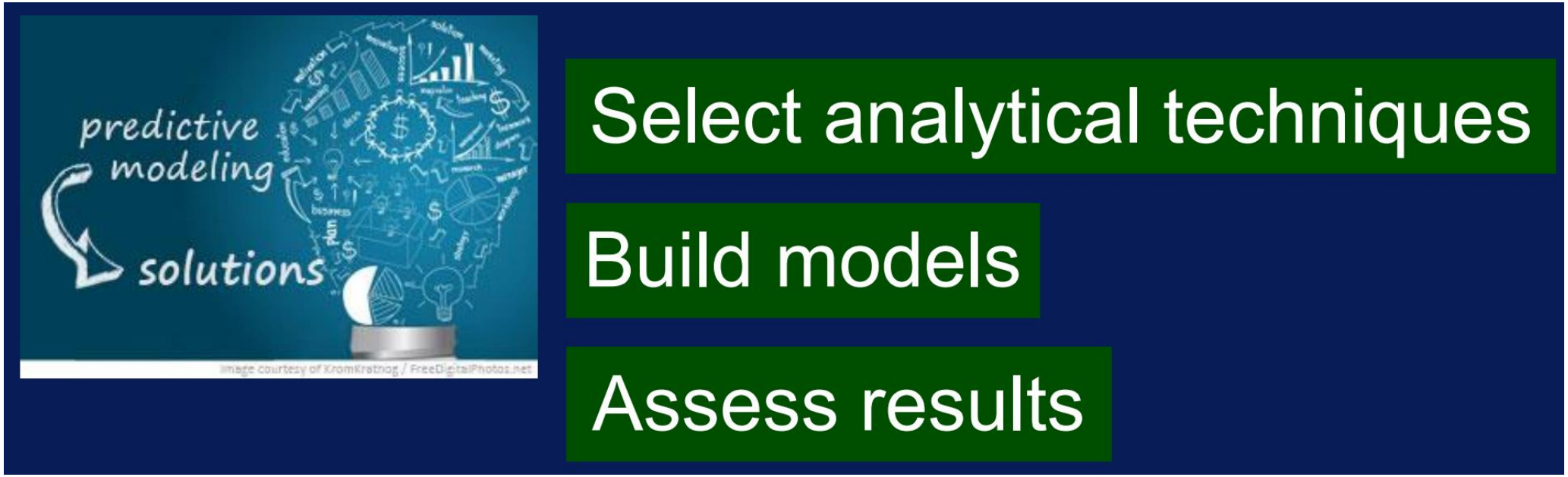
Machine Learning Process

- Data Analysis (Modeling)



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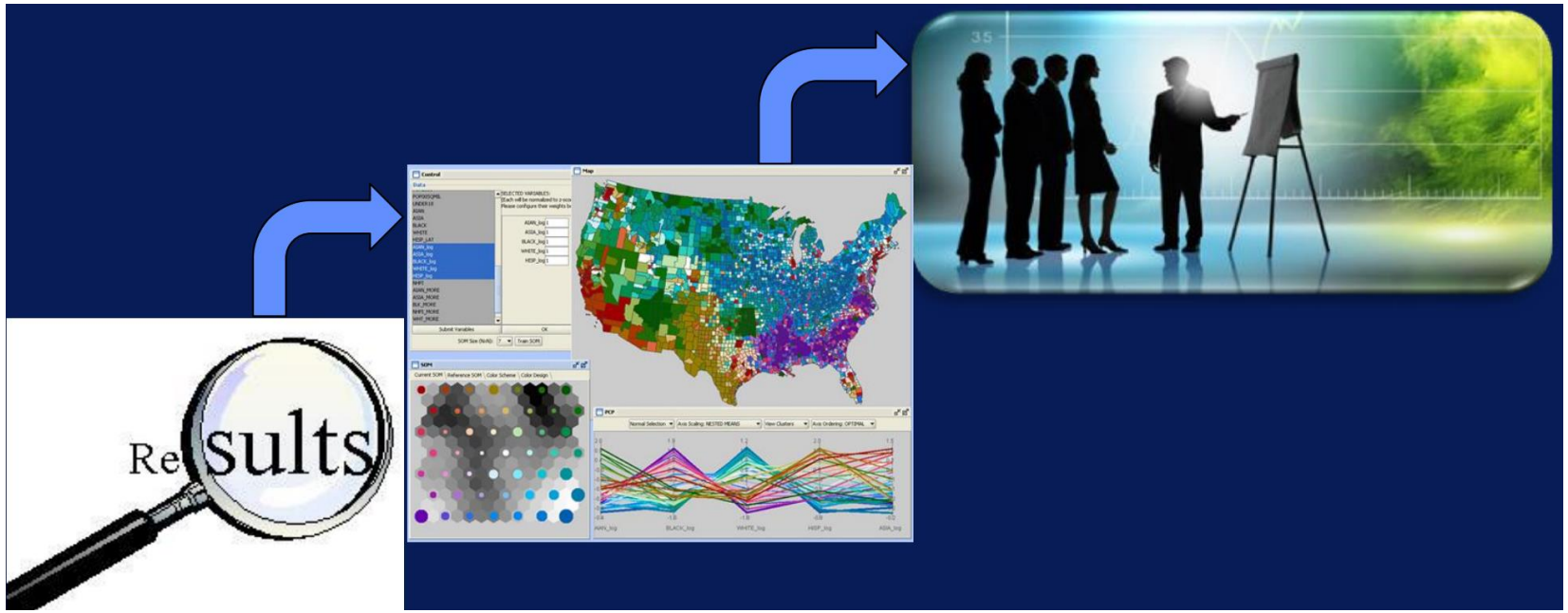
Machine Learning Process

- Result Visualize and Report (Evaluation)



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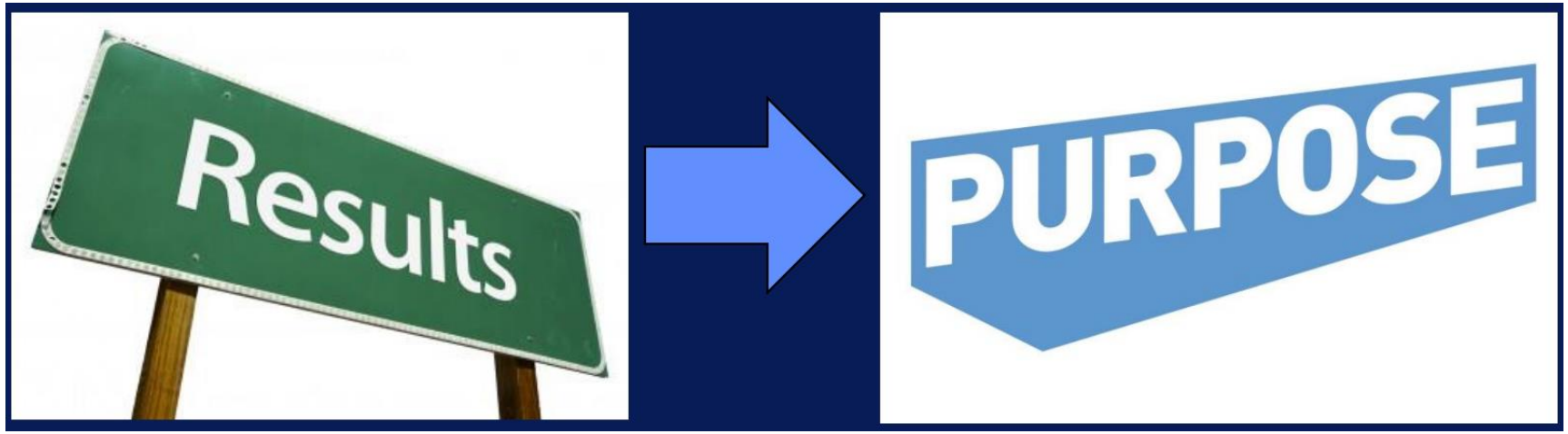
Machine Learning Process

- Apply Result to Applications: Deployment



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