DATA ANALYTICS

OVERVIEW

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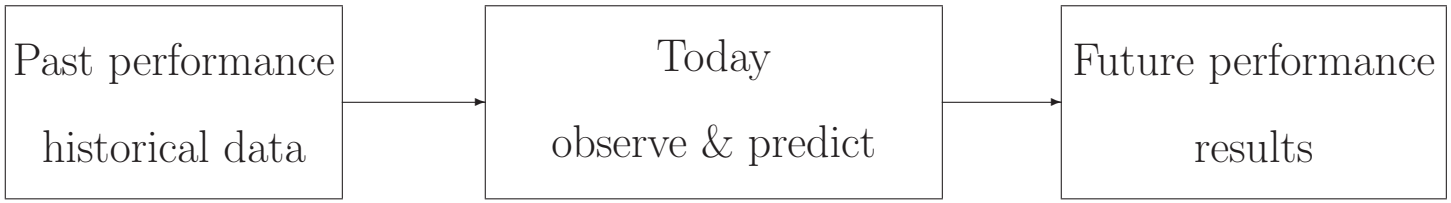
DEFINITION

DATA ANALYTICS

Set of mathematical and statistical methods
to collect *meaningful* information
from data

INTRODUCTION



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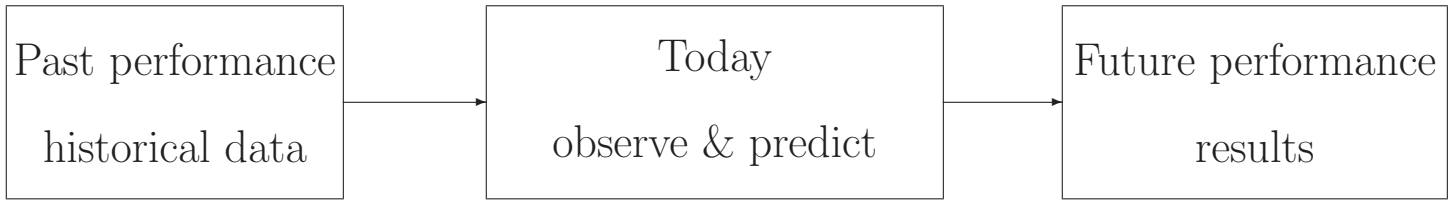

What has happened?

What may happen?

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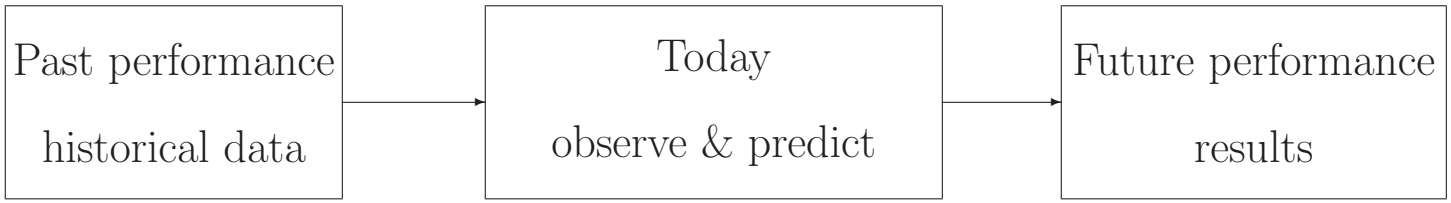

What has happened?

describe/summarize data

What may happen?

scenarios

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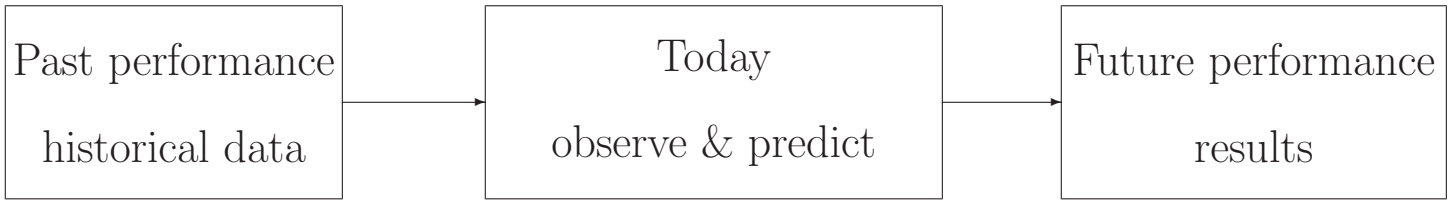

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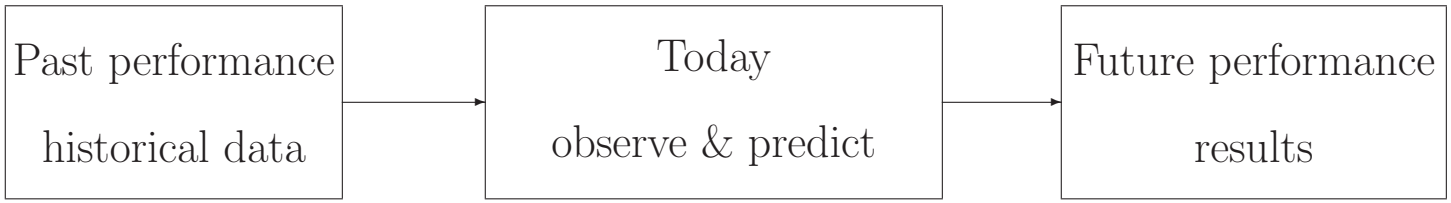

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piecharts, line charts
histograms
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std. deviations
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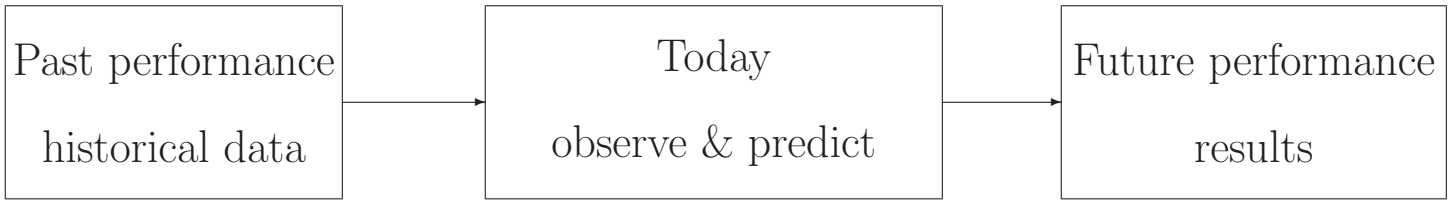

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Prediction Models

Classification models
Prediction models
Clustering methods

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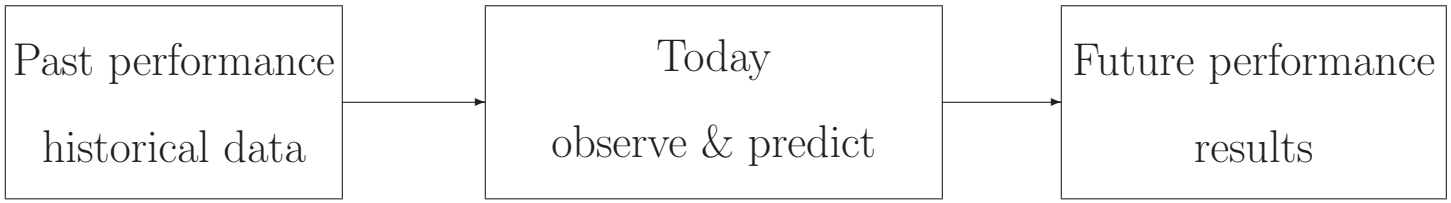

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Predictive Analytics

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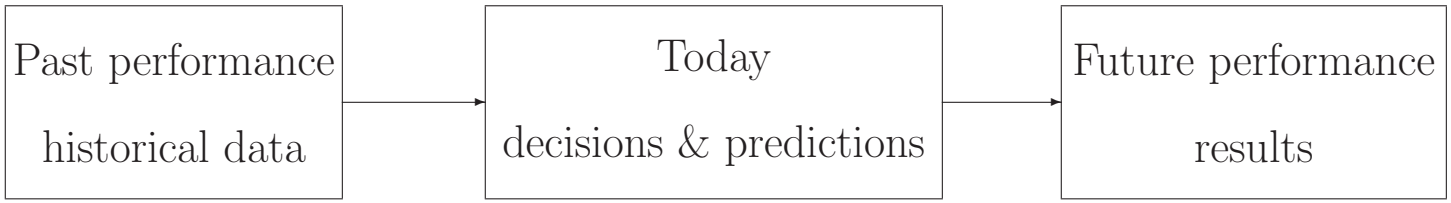

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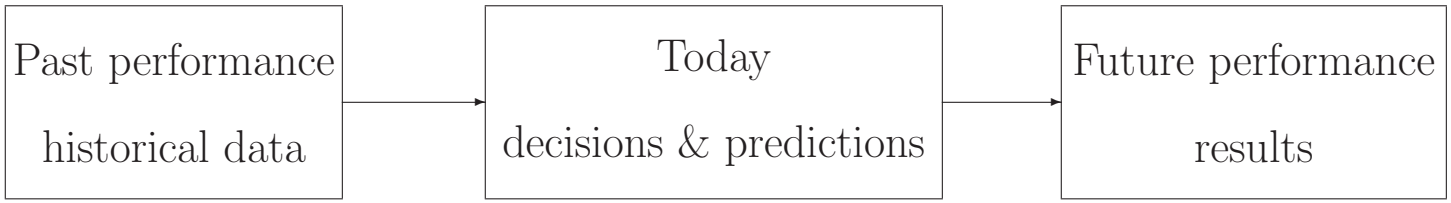

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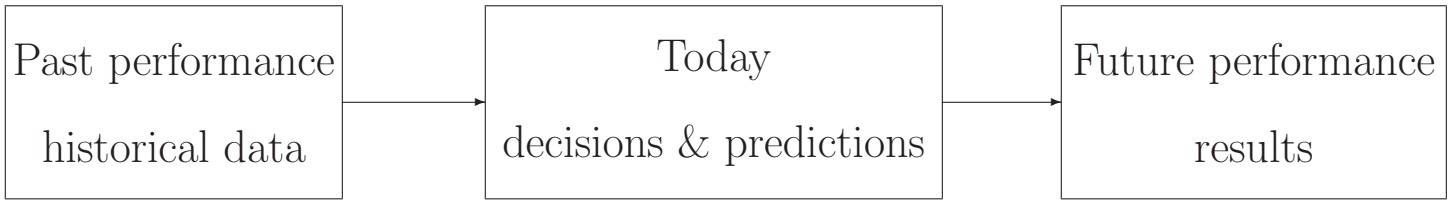

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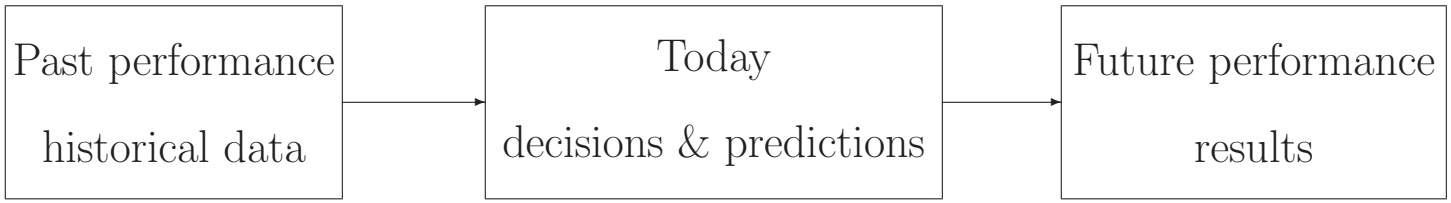

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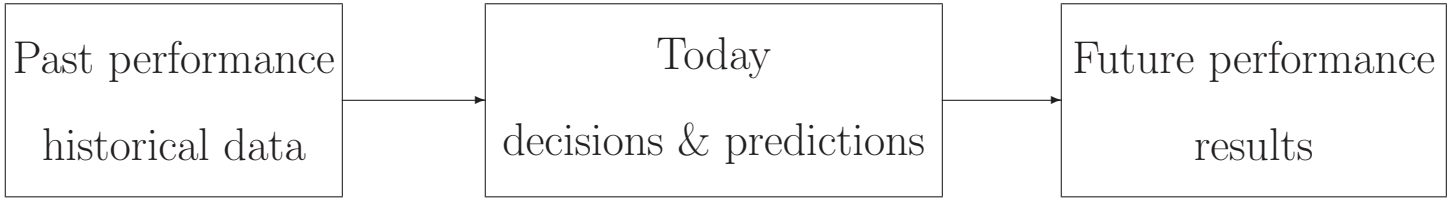

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DESCRIPTIVE ANALYTICS

- Summary of historical data

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- We need
  - clean
  - up to date
  - well organized

  data sets

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Business Intelligence software

DESCRIPTIVE ANALYTICS - BUSINESS INTELLIGENCE (BI)

- Software
  - to collect data from internal systems
  - to prepare it for descriptive analysis
  - to create reports and dashboards
  - in very efficient ways

DESCRIPTIVE ANALYTICS - BI SOFTWARE

- Tableau
- MS Power BI
- Qlik
- SAS
- SAP
- IBM Cognos

GARTNER -BI ANALYTICS- MAGIC QUADRANT

DESCRIPTIVE ANALYTICS - BI SOFTWARE

- Tableau
- MS Power BI
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Very limited for Predictive Analytics

PREDICTIVE ANALYTICS - MODELING

- PREDICTION
- CLASSIFICATION
- CLUSTERING

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Machine learning software

PREDICTIVE ANALYTICS - MACHINE LEARNING SOFTWARE

- SAS, R, Weka
- RHadoop, SAS over Hadoop
- Spark, Twister, Haloop, GraphLab
- SAS in-memory Analytics

PREDICTIVE ANALYTICS - MACHINE LEARNING SOFTWARE

- SAS, R, Weka (Most powerful)
- RHadoop, SAS over Hadoop (Big data)
- Spark, Twister, Haloop, GraphLab (Big data, 2nd generation)
- SAS in-memory Analytics (Big data, 3rd generation)

PREDICTIVE ANALYTICS - PREDICTION MODELS

- MLR with numerical/categorical predictors
- Nonlinear regression
  - Polynomial regression
  - Interaction terms
- Generalized Linear Models
- Regression Trees
- Support Vector Machine for regression

PREDICTIVE ANALYTICS - CLASSIFICATION MODELS

- Logistic regression
- KNN
- Classification Trees,
- Ensemble of Trees (Bagging, Boosting, Random Forest)
- SVM

PREDICTIVE ANALYTICS - CLUSTERING METHODS

- Principal Components
- K-means
- Hierarchical clustering

DATA ANALYTICS - Machine Learning

- Graph Search
- Voice Recognition
- Recommender System
- Matching
- Text classification (fake?)