

MFE204TC

ARTIFICIAL INTELLIGENCE

AND DATA ANALYSIS

INTRODUCTION

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CONTENTS

- Course Introduction
- Timetable
- Matlab
- Data Analysis

Certain contents of this presentation are adopted from training material at MathWorks



COURSE INTRODUCTION

Educational Aims of Course Part II: Data Analysis, 30%

(2) providing a grounding in Program Language (MATLAB), used as a vehicle for practical illustrations;

Learning Outcome

E. Acquire the essentials of Programming Language (MATLAB) so as to enable further exploration of the above in practical usages in AI.

References:

<https://www.mathworks.com/solutions/data-analysis.html>



TIMETABLE

Lectures

Week 1-5, Tuesdays 6-8pm

Venue

Onsite Class: TC AB-2002



MATLAB

- Required platform for this course
 - Software which was originally developed as a matrix laboratory.
- Uses finite-precision arithmetic
- Typically produces approximate digital solutions
- Toolboxes - designed for various of applications



APPLICATIONS

Railway Systems



Automotive



Aeronautics



Retail



Finance



Off-highway vehicles



Industrial Automation



Oil & Gas



Clean Energy



Medical Devices



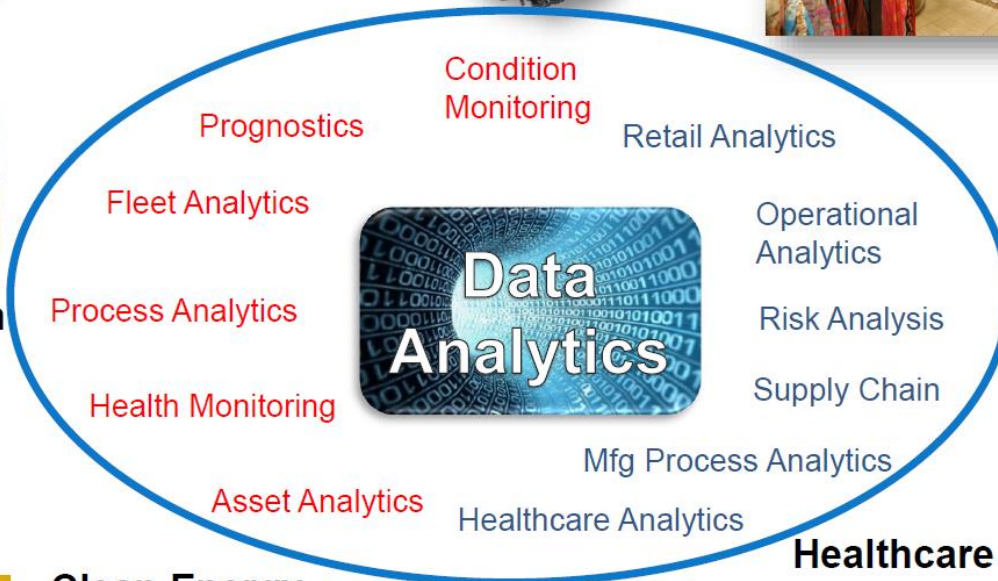
Healthcare Management



Internet

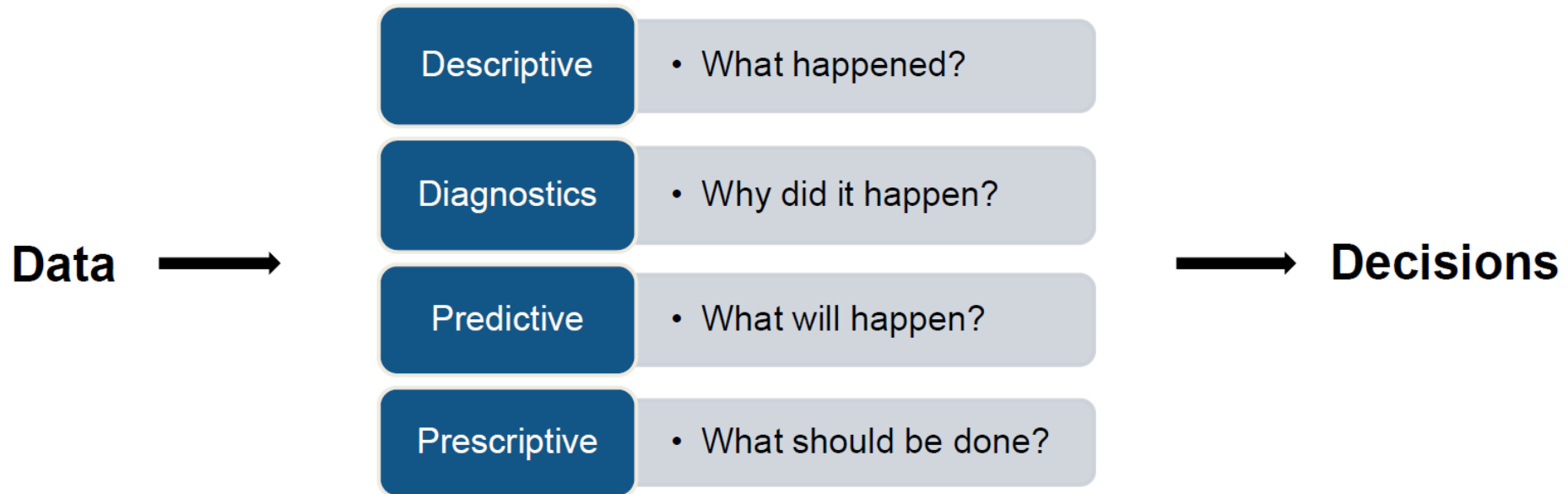


Logistics



WHAT IS DATA ANALYTICS

Turn large volumes of complex data into actionable information



WORKFLOW

Access and Explore
Data

Preprocess Data

Develop Predictive
Models

Integrate Analytics with
Systems

Files



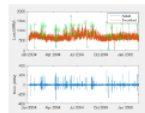
Databases



Sensors



Working with
Messy Data



Data Reduction/
Transformation



Feature
Extraction



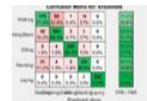
Model Creation e.g.
Machine Learning



Parameter
Optimization



Model
Validation



Desktop Apps



Enterprise Scale
Systems

MATLAB Excel
.NET C/C++
.exe Java .dll

Embedded Devices
and Hardware



SYLLABUS OF PART II: DATA ANALYSIS

- **Data Processing**
 - Importing and Exporting
 - Plotting
 - Data smoothing
- **Regression Analysis**
 - Correlations and Regression
 - Curve fitting
- **Time Series Analysis**
 - Time series objective and collections

