MATLAB EXPO 2018
Introduction to MATLAB

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Key Takeaways

MATLAB can be used at all stages of your work.

How to automate analysis.

Many resources available to help you to learn basic and advanced MATLAB concepts.
What is MATLAB?

High-level computer language **designed to be used by scientists and engineers** within an easy-to-use interactive environment.

**Extendable** using toolboxes that provide targeted functionality for specific types of analysis or area of expertise.

Large range of use cases from simple, **quick analysis** to in-depth programmes for **production** deployment.
Example: Bicycle Traffic Analysis
Technical Computing Workflow

Access
- Files
- Software
- Hardware

Explore & Discover
- Data Analysis & Modeling
- Algorithm Development
- Application Development

Share
- Reporting and Documentation
- Outputs for Design
- Deployment

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Example: Bicycle Traffic Analysis

Bicycle count for journeys toward Harvard (Westbound) and toward City Centre (Eastbound).

Counts recorded every 15 minutes.
Compare with Weather Data

Historical weather data for Boston, MA.

Same time period as bicycle traffic data.
Importing Data: Interactive or Generate Code

Interactively import data with the Import Tool:
Are bicycle counts related to the weather?

Live Editor allows for quick and easy exploration of data.
Introduction to MATLAB

In this script, we will import data from .csv files interactively, and then generate code to bring in the data programmatically.

The bicycle counts data comes from sensors on Broadway, Cambridge, Massachusetts, and counts the number of bikes travelling toward Harvard (Westbound) and toward the city centre (Eastbound) every 15 minutes.

Importing Data

Data can be imported interactively using the Import Tool.
Sharing Code and Applications

Create stand-alone application for MATLAB and Non-MATLAB users.
MATLAB Onramp

MATLAB R2017b

Chapter 9.1 Plotting Vectors

Task 1

Info: Two vectors of the same length can be plotted against each other using the `plot` function.

```matlab
>> plot(x,y)
```

Try creating a plot with `sample` on the x-axis and `mass1` on the y-axis.

```
>> load datafile
>> sample = data(:,1);
>> density = data(:,2);
>> v1 = data(:,3);
>> v2 = data(:,4);
>> mass1 = density.*v1;
>> mass2 = density.*v2;
```

Task 1

```matlab
>> plot(sample,mass1,'*r')
```

Further practice
MATLAB Training

Classroom Training

Customized training at your work site

Live Online Courses

Self-paced training

Certification
Summary and Benefits

▪ Easy and fast to explore ideas.

▪ Easy deployment and reporting

▪ Single software for entire workflow.

▪ Numerous resources for learning and getting help in MATLAB.