

2 Introduction to MATLAB

2.1 Introduction

2.2 Getting Started

The default search path includes only the *MATLAB_R2025b* directory—which is created by the installer in the applications folder—and the default working directory *MATLAB*.

2.3 MATLAB Syntax

after the prompt in the Command Window and then press the *enter* key.

It is therefore recommended that a new MATLAB project always **starts** with the line

After pressing *enter*, MATLAB displays the array

This interval can then later be used to create **an** evenly spaced time **axis** for time series analysis.

2.4 Array Manipulation

which tells us the **length** of the largest array **dimension**. Hence, `length` is normally used to determine the length of a one-dimensional array (or vector), such as the evenly spaced time axis `c`, which was created in **Chap. 2.3**.

2.5 Data Types in MATLAB

We use `rand`, which generates uniformly distributed pseudorandom numbers within the interval $(0,1)$.

Since 8 bits can be used to store 256 different values, this data type can be used to store integer values between 0 and 255, whereas using `int8` to create signed 8-bit integers generates values between -128 and $+127$, **including 0**.

```
locations_1 = ...  
    ['Bornim'   ''];...  
    ['Nedlitz'  ''];...  
    ['Bornstedt'];...  
    ['Sacrow'   ''];...  
    ['Eiche'    ''];...  
    ['Grube'    ''];...
```

```

        'Golm'      '']

locations_2 = ...
    ["Bornim";...
    "Nedlitz";...
    "Bornstedt";...
    "Sacrow";...
    "Eiche";...
    "Grube";...
    "Golm"]

```

The second **field** (date) contains an array of the datetime data type generated by the function `datetime`, which yields the current date in `dd-mm-yyyy` format.

Another very convenient way to store mixed data types in a single array involves the use of **tables**. This data type was introduced with the MATLAB R2013b release and is very useful when reading large datasets (see **Chap. 2.6**). **Tables** store column-oriented or tabular data, with named variables stored in individual columns.

```

potsdamnorth =

7x2 table

    Districts    Inhabitants
    _____    _____
    {'Bornim'    }    3543
    {'Nedlitz'   }    198
    {'Bornstedt'}    15724
    {'Sacrow'    }    148
    {'Eiche'     }    5139
    {'Grube'     }    451
    {'Golm'      }    4222

```

2.6 Data Storage and Handling

As of MATLAB release R2020a, the Editor saves new files using UTF-8, but we can explicitly specify ISO-8859-1 instead using the *Save As* dialog. The recipe files and many example data files in the supplement in the book are also stored in UTF-8.

2.7 Control Flow

2.8 Scripts and Functions

2.9 Basic Visualization Tools

2.10 Generating Code for Recreating Graphics

Clicking on the arrow icon in the *Figure Toolbar* enables the *Edit Plot mode*.

2.11 Publishing and Sharing MATLAB Code

2.12 Creating Apps with Graphical User Interfaces

2.13 Calling Python from MATLAB

Recommended Reading

Figure captions