

Self-study session 2, Linear algebra

First year mathematics for the technology and science programmes
Aalborg University

The present self-study is supported by screencasts 4 and 5. These screencasts are in Danish but you might still get an outcome from viewing them. It might be a good idea to watch the screencasts before continuing. When needed during the exercise solving you can watch them again.

In this self-study we shall work with m-files in MATLAB. Consider the following example: Using a text editor type the following lines:

```
% This file solves Exercise x
'Exercise x'
A=[ 1 2
    3 6]
B=[ 7 8
   -1 -2]
'The product is:'
A*B
```

(if you copy the above text rather than typing it in yourself you might experience a problem with the quotation marks). Save the file under the name "myfirstmfile.m" in the MATLAB library. The important thing here is the file extension ".m" and where to save it. You can now execute the file in MATLAB simply by writing "myfirstmfile" in the Command Window. Edit the above file by choosing different matrices A and B and execute it once again. Note that by starting a line with % you can write a message that is only visible in the text file. This for instance is the case for the line:

```
% This file solves Exercise x
```

Note also that by using quotation marks you can make MATLAB write a text string. This for instance is the case for the line:

```
'The product is:'
```

Use m-files when answering the self-study below.

We first investigate Kirchoff's laws. Read the section named "CURRENT FLOW IN ELECTRICAL CIRCUITS", 60⁵ – 62⁹ in [SIF]. Notice that the solutions to Practice Problems 2 and 3 can be found at page 65. Solve Exercises 25, 27, 29 and 30 at page 64: Determine the corresponding linear equations and solve them using MATLAB.

We next consider $(0,1)$ -matrices. Read the section named " $(0,1)$ -MATRICES", 112⁵ – 115₂₀ in [SIF]. Notice that the solution to Practice Problem 3 can be found at page 122. Using MATLAB solve Exercises 21, 26, 22 at page 120-121.

Solve the MATLAB-exercises at pages 195-196: 1, 3, 5, 7.