

# Exercise 1, MATLAB Environment Lab

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## 1 Abstract

This laboratory reports main focus lies within getting us familiar with the MATLAB environment. This is achieved through asking us to write a script that outputs a graph.

## 2 Introduction

In this laboratory report we are going to use MATLAB to create a graph. MATLAB is a language that manipulates vectors and matrices. This lab is mostly about learning how to work with MATLAB and see the benefits of using it.

### 2.1 Purpose

The purpose of this lab is to plot the function  $\sin(10x) + x$  in blue colour,  $\sin(30x) + 1$  in red colour and  $x^2$  in green colour. The plotted graph is meant to have smooth curves and dotted grids; have the range  $(-1, 5)$  and domain  $[0, 2]$  - and also have labels for its axes:  $x$ -axis as  $x$  and  $y$  as  $f(x)$ .

## 3 Method

### 3.1 Tools/Material

- A computer fitting for the task
- $\text{\LaTeX}$  editor, in this lab Overleaf was used
- MATLAB
- EX1\_perspective.zip ([link](#))

## 3.2 Implementation

We opened Matlab and entered the following code:

```
% Line in remarks: Linnea Olsson, Andre Frisk, Andreas R Almgren
% Create a vector of 1000 evenly spaced points in the interval [0, 2].
x = linspace(0, 2, 1000);
f1 = sin(10 * x) + x;
f2 = sin(30 * x) + 1;
f3 = x.^2;
% Plot the functions f1, f2 and f3. Specify the colours of respective
% functions.
plot(x, f1, 'b', x, f2, 'r', x, f3, 'g')
% Specify limits on f-axis.
ylim([-1 5])
% Specifies axis tick values.
xticks([0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2])
% Set label below x-axis.
xlabel('x')
ylabel('f(x)')
grid on
% Current axes.
ax = gca;
% Set the style of the gridlines to be dotted.
ax.GridLineStyle = '--';
% Make a legend.
legend('sin(10x) + x', 'sin(30x) + 1', 'x^2', 'Location', 'northeast')
% Save plot as a PNG named e1_1.
print('-dpng', '-r600', 'e1_1')
```

After having finished the code, we ran it.

## 4 Result

We found that when executing the file e1\_1.m, we got the output that can be seen in figure 1.

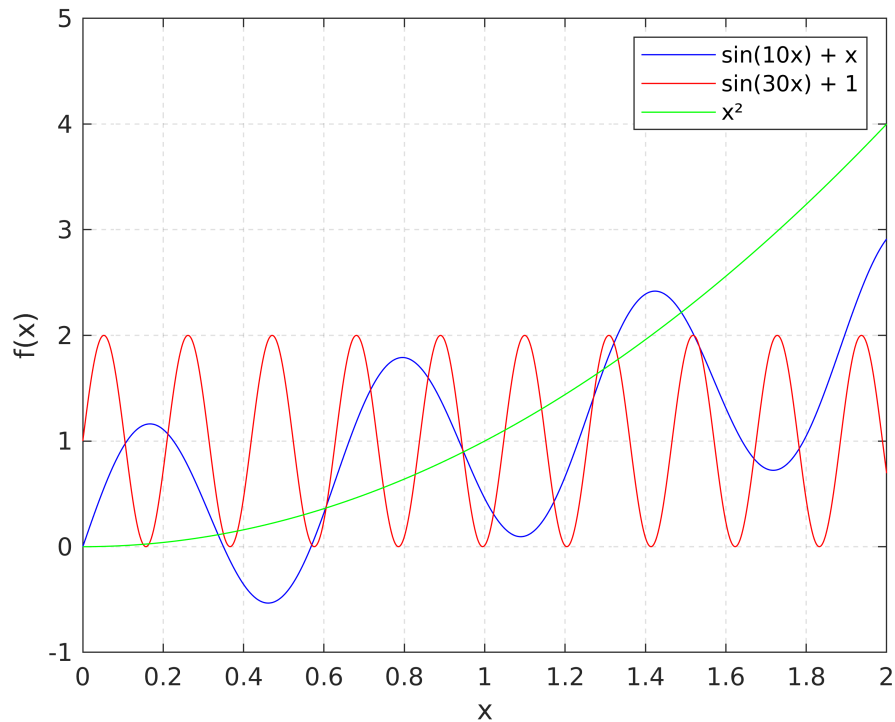


Figure 1: Output of e1\_1.m.

Figure 1 has the functions  $\sin(10x) + x$ ,  $\sin(30x) + 1$  and  $x^2$  plotted in it.

## 5 Conclusion

We successfully plotted a graph including what we aimed to include in 2.1.

## 6 Note on a bug in the instructions

In the pdf e1v3.pdf (found in EX1\_perspective.zip) we are told to plot the function  $\sin(30x) + 1$  in red and also that the same function should be plotted in green. We chose to use the first alternative.