# Computer Programming with MATLAB


## Lesson 3: Functions

by

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# Formal Definition

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- `function [out_arg1, out_arg2, ...] = function_name (in_arg1, in_arg2, ...)`
- Examples
  - `function func`
  - `function func(in1)`
  - `function func(in1, in2)`
  - `function out1 = func`
  - `function out1 = func(in1)`
  - `function [out1, out2] = func`
  - `function [out1, out2] = func(in1, in2)`
  - …

# Function names

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- Use meaningful names that tell you something about what your function does
- Do not use existing names, e.g., plot, sum, sqrt, sin, etc.
  - MATLAB already has these
  - It would get really confusing really fast
  - To check whether a name is already in use, try the built-in exist function. To see how it works, try

```
>> help exist
```

# Advantages of functions


- Functions allow you to break down large, complex problems to smaller, more maneagable pieces
- Functional decomposition
- Reusability
- Generality
  - A function can solve a set of related problems not just a specific one by accepting input arguments.
  - For example, the built-in function **`plot`** can draw a wide range of figures based on its input