

Introduction to MATLAB bootcamp

Week 2 Lecture 4

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Functions in MATLAB

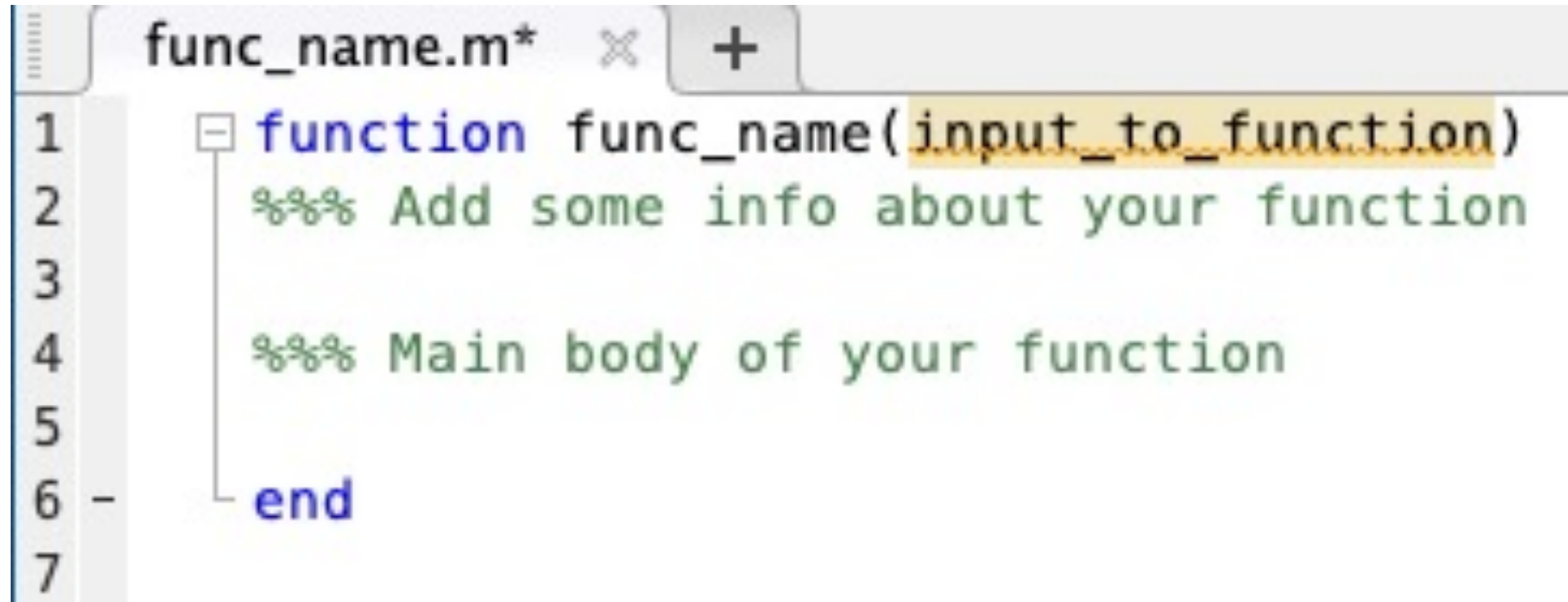
- You have already used many in-built MATLAB functions such as:
- sort
- max
- min
- mean
- unique
- disp

Fahrenheit to Celsius conversion

$$C = \frac{5}{9}(F - 32)$$

You are given three liquids with temp 80°F, 110°F, and 210°F. What is the average temperature of the three liquids in Celsius?

Syntax for function

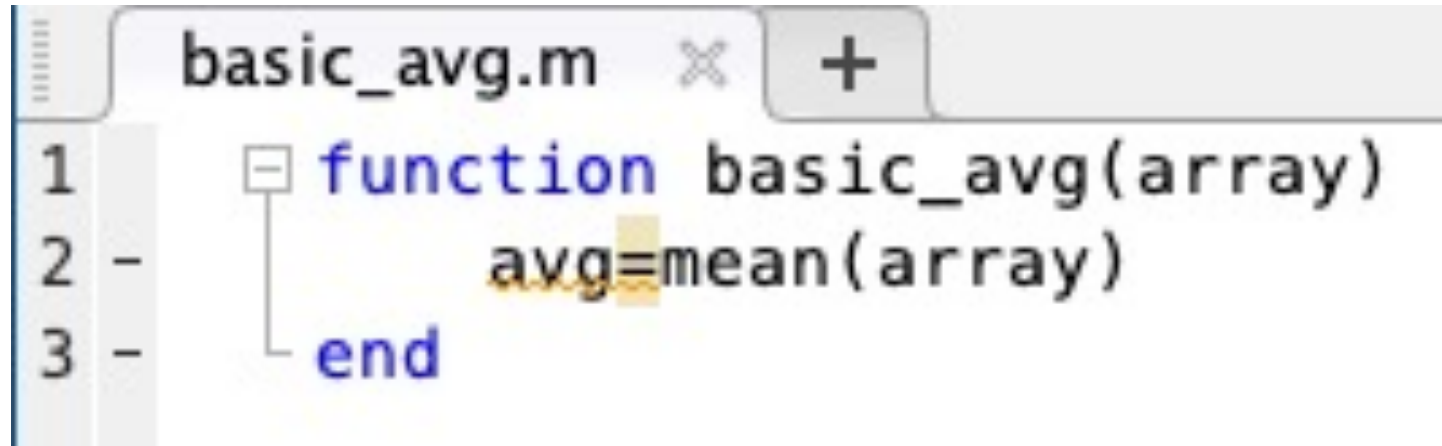
A screenshot of a MATLAB script editor window titled 'func_name.m*'. The window shows a function definition starting with 'function' in blue, followed by 'func_name' and an input argument 'input_to_function' which is highlighted with a yellow background. Below this is a comment line '%%% Add some info about your function' in green. Another comment line '%%% Main body of your function' is shown on the next line. The function ends with 'end' in blue. A vertical line connects the 'function' keyword to the 'end' keyword. The left margin shows line numbers 1 through 7.

```
1 function func_name(input_to_function)
2     %%% Add some info about your function
3
4     %%% Main body of your function
5
6 end
7
```

Important:

- 1) Rules for naming a function is same as rules for naming a variable
- 2) Name of the function and the name of the function file must be SAME

Example: basic_average



```
basic_avg.m  x  +
1  function basic_avg(array)
2  -      avg=mean(array)
3  -  end
```


The image shows a MATLAB script editor window titled 'basic_avg.m'. The code is as follows:

```
function basic_avg(array)
    avg=mean(array)
end
```

Line numbers 1, 2, and 3 are visible on the left. The word 'function' is highlighted in blue. The variable 'avg' is highlighted in yellow. The word 'end' is highlighted in blue. A small square icon is next to the 'function' keyword.

Drawback: The output of this function is not stored as a separate variable

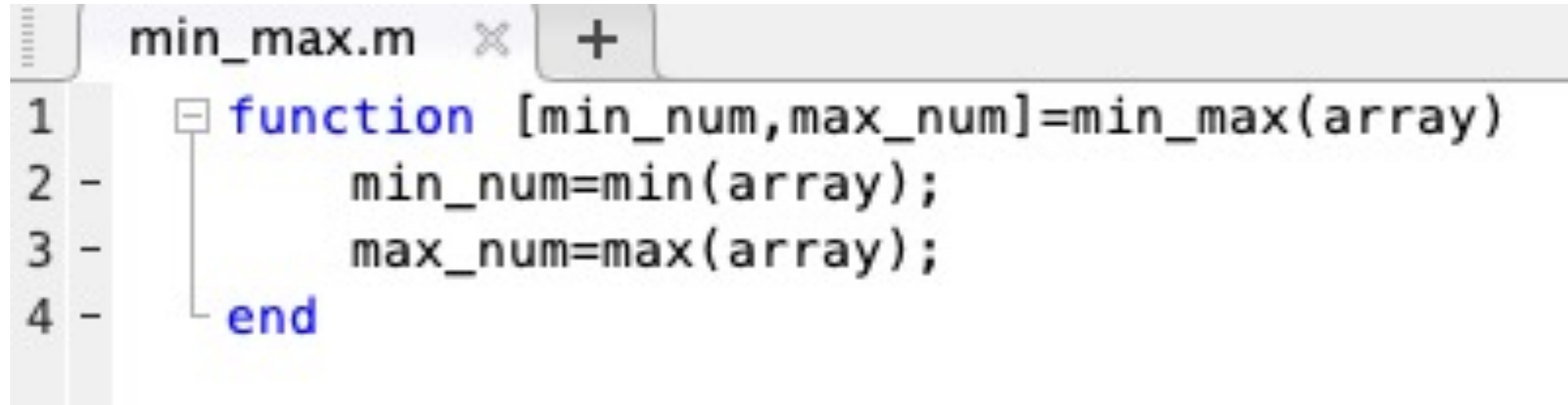
Store output of the function as a variable



The image shows a MATLAB script editor window titled 'better_avg.m'. The script contains a function definition for 'avg' based on the input 'array'. The function is defined on three lines: line 1 starts with 'function', line 2 assigns the result of 'better_avg(array)' to 'avg', and line 3 ends with 'end'. The 'function' and 'end' keywords are highlighted in blue. A yellow highlight is under the 'end' keyword. A line number column on the left shows '1', '2', and '3'. A small square icon is next to line 1, and a vertical line connects it to the 'end' keyword on line 3. The window has a tab labeled 'better_avg.m' with a close button 'x' and a plus button '+'. The background of the editor is light gray.

```
1 function avg=better_avg(array)
2     avg=mean(array);
3 end
```

Generate multiple outputs



The image shows a MATLAB script editor window with a tab labeled 'min_max.m'. The script contains a function definition for 'min_max' that takes an 'array' as input and returns two outputs: 'min_num' and 'max_num'. The function is defined using the 'function' keyword and ends with the 'end' keyword. The code is as follows:

```
1 function [min_num,max_num]=min_max(array)
2     min_num=min(array);
3     max_num=max(array);
4 end
```