
MT240_NR_3_2_1_T Parallel Resistors

Table of Contents

Title	1
Description	1
Exercise	1
Questions	1
Useful Information	1
Provided Code	2
Solution	2

Title

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Description

MATLAB allows the users to create functions that contain reusable code. This increases organization, readability, and reduces time spent writing redundant code.

Exercise

1. Create a function file that can accept an array whose values represents resistor values. The function will add the resistors in parallel and return their equivalent value.
2. Create an array named 'Resistors' with the values: 64, 64, 32, 16, and 8.
3. Pass the array 'Resistors' into the function you created and verify that the function's output is the parallel combination of the resistor values in the array 'Resistors'.

Questions

What is the output of your function when passed in the array 'Resistors'?

Useful Information

A [function](#) is created in a function.m file. A function.m file is created in a similar way to a script file. Under the **Home** tab, click the + icon and navigate in the drop-down menu to 'function'. After selecting it, a new tab will open in your **Editor** window. The content of the tab should look like the following.

```
function [ output_args ] = Untitled( input_args )
%UNTITLED3 Summary of this function goes here
% Detailed explanation goes here

end
```

Below are brief descriptions of different parts of a function file.

Untitled - This is the name of the function. It can be changed to a different name; however, the name of the function must be the same as the name of the file. Ex. If the function name is ParallelResistor then the file name must also be ParallelResistor with the .m file extension.

[output_args] - MATLAB can return more than one argument. All output return arguments are placed within the brackets and separated by a comma or space. Note that the output arguments must be assigned their value in the body of the function. Ex. If the function's output argument was 'Req' then Req would need to be assigned a value in the body of the function.

(input_args) - MATLAB allows more than one argument to be passed into the function. If there are multiple input arguments, they must be separated by either a comma or space and reside within the parentheses.

Any script file can be changed into a function by adding the function heading to the top of the script file, and ensuring that the file's name is the same as the function's.

In this assignment, the function that will be created will take in an array that represents multiple resistors in parallel. Resistors can be added together using the following steps.

1. Let R1, R2, R3, through Rn represent resistors in parallel.

2. And let $R_{eq} = R1 // R2 // R3 // \dots // Rn$

3.
$$\Rightarrow R_{eq} = 1 / \left(\frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3} + \dots + \frac{1}{Rn} \right)$$

Consider using the [sum](#) command. Its input argument is an array of numbers, and its output is the sum of the array's element values.

```
x = [1 2 3 4 5];  
y = sum(x);
```

y is assigned the value 15.

Provided Code

```
function % INSERT CODE HERE  
% The function adds an array of parallel resistors.  
% 'input argument's name' - This input argument is an array whose  
%                             contents represents multiple resistors in  
%                             parallel.  
  
% INSERT CODE HERE  
  
end
```

Solution

The function should return 4 Ohms

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