

ECE 257 - LESSON 11

INTRODUCTION TO FUNCTIONS

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IN CLASS

SOME SIMPLE FUNCTIONS AND THE PROGRAMS THAT CALL THEM

1. A function with one input and one output that doubles its input. Be sure to save it as `double_num.m`

```
function y = double_num(x)
% This function doubles the value of x

% Record of revisions
%

% Input variables
% x = number being doubled - gotten from the calling program

% Output variables
% y = two times x - sent to calling program

% Internal variables
%

% Doubling of x
y = 2*x;

end % end double_num
```

- a. How is the name of the function related to its M-file name
- b. Describe the syntax of the first line of a function. What in particular is `y`
- c. What's the last line of a function
- d. What happens when we type `help double_num`

A program that calls the function `double_num`

```
% Script: doubling
% This program makes use of the function double_num to double the value of a
% number input by the user

% Record of revisions
%

% Input variables
% a = inputted number being doubled

% Output variables
% b = two times inputted number

% Internal variables
%

% Input the number to be doubled
```

```

a = input ('Enter the number you want to double: ');
% Call the function to double the inputted number
b = double_num(a);

% Output the doubled number
disp(['Two times a = ', num2str(a), ' is b = ', num2str(b)])

```

f. Could we have used the variable names x and y in the program instead of a and b

2. Modify the doubling program above to use the following function to input the value of a

```

function a = input_a
% This function inputs the value of a

% Record of revisions
%

% Input variables
% a = number being doubled

% Output variable
% a = number being doubled

% Internal variables
%

% Inputting a
a = input ('Enter the number you want to double: ');
end % end input_a

```

3. Run the above program again but this time input a 1x2 vector of two numbers

4. Modify the function and program in Exercise (1) to double two numbers with different variables names as follows

```
function [y1, y2] = double_nums(x1, x2)
```

a. What did you have to change in the original function

5. Modify the toy car program of Lesson (9) to contain the following functions

Function 1 - Input the data from the user

Function 2 - Calculate the distance between the cars as a function of time

Function 3 - Plot the distance between the cars

The main program is to be the manager that directs the action as it calls the functions