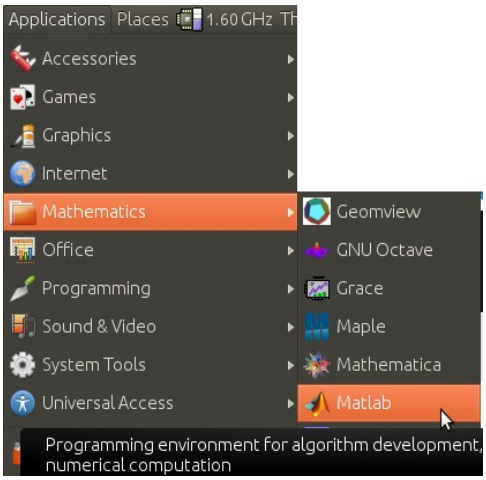
Writing MATLAB programs on the math department's computers

Lets say the assignment is to write a M-file to compute the product of two numbers. You might be given the function signature (more on what this means later) below:

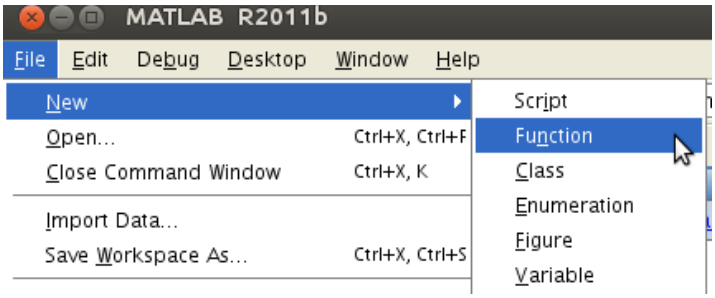
```
%Input
%    a, b: two numbers
%Output
%    prod: the product of a and b
%Example
%    demo_product(4, 5) gives 20
function [prod] = demo_product(a,b)
    code here
end
```

This problem is asking you to write a MATLAB function called demo_product that computes a product. Clearly this is a silly function, but we will walk through the steps to do it.

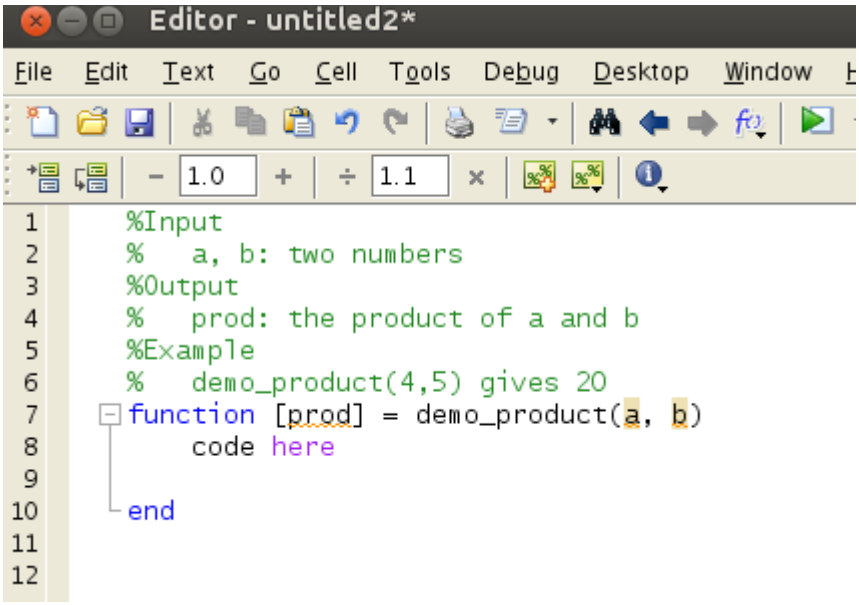
Step 1: Go to applications > math > matlab



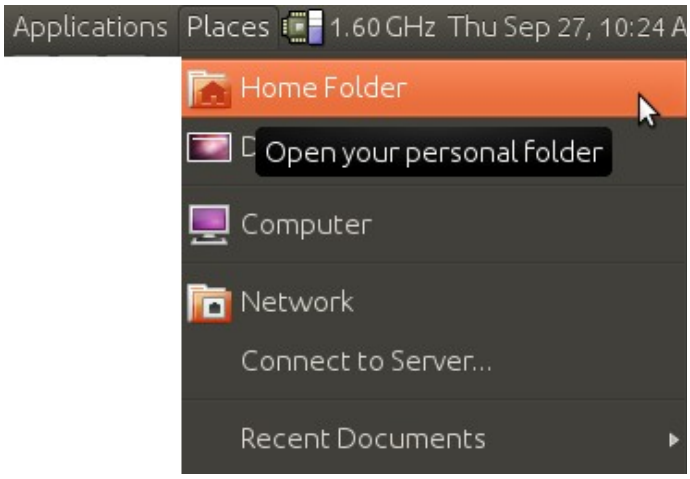
Step 2: Go to file > new > function



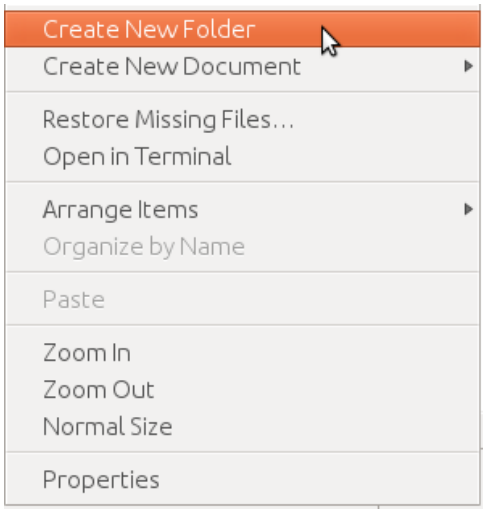
Step 3: Copy the function signature in the new window



Step 4: Make a folder in your home directory to save this file: go to places > home folder

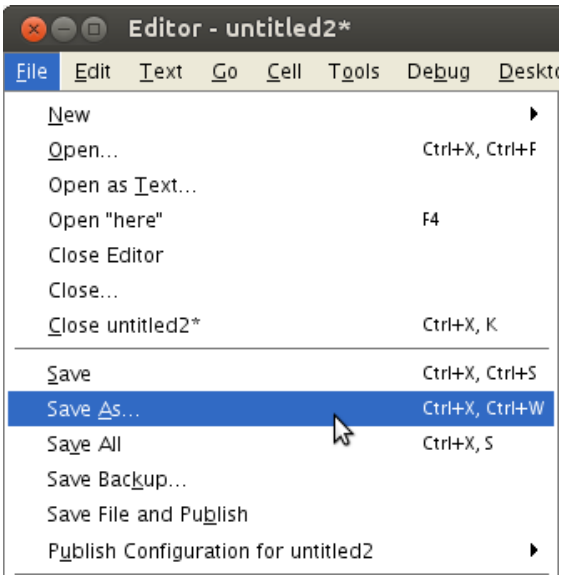


Right click and make a new folder

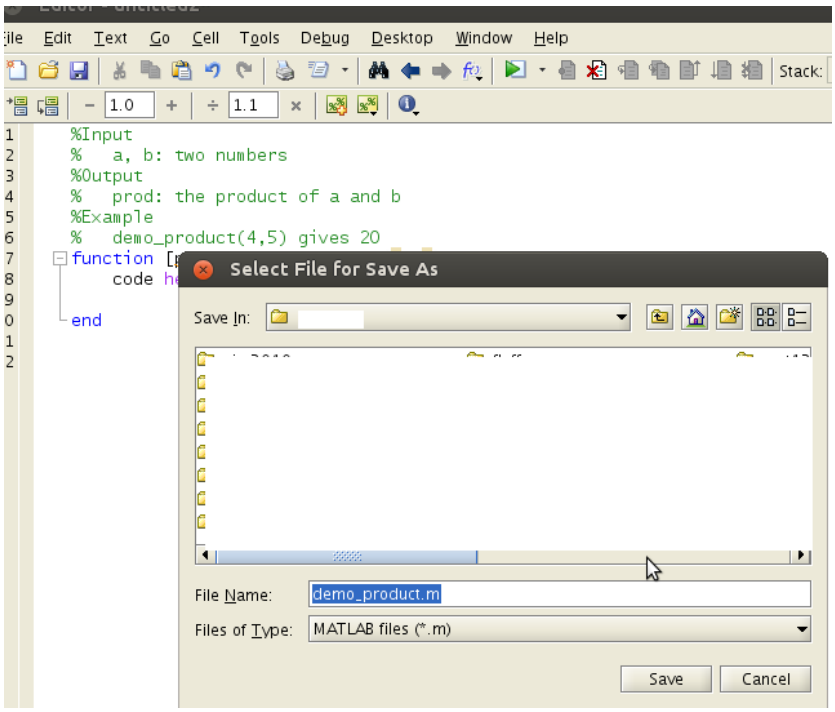


Name this folder “matlabDemo” or anything you want.

Step 5: Save the MATLAB M file. Go to file > save as



Go inside the matlabDemo folder and save it.

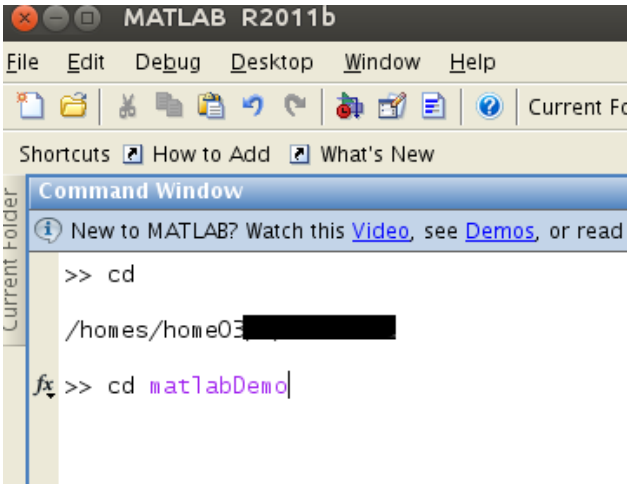


It is **VERY** important to save it as “demo_product.m” Other file names will result in an error later. Also, the case of the letters is important, hence the names “demo_product.m” and “demo_Product.m” are NOT the same.

Step 6: Edit the function and save the file by clicking on the save button.

```
%Input
%   a, b: two numbers
%Output
%   prod: the product of a and b
%Example
%   demo_product(4,5) gives 20
function [prod] = demo_product(a, b)
    prod = a*b;
end
```

Step 7: Type “cd” then hit the enter key. Then Type “cd matlabDemo” or the name of the folder you made in step 5 and hit the enter key. This command tells MATLAB to look in the matlabDemo folder when you execute the function.



Step 8: Go to the MATLAB main command window and type

```
>> demo_product(4,5)

ans =

    20
```

Step 9: Try other input values. Make sure things are working correctly (what happens if you try complex inputs?) If demo_product(a,b) was a real assignment, you would then submit the demo_product.m file to Smartsite.

What is a function signature?

Consider the function below.

```
%Input
%   a, b: two numbers
%Output
%   prod: the product of a and b
%Example
%   demo_product(4, 5) gives 20
function [prod] = demo_product(a,b)
    code here
end
```

This function has three parts

1. Function name (demo_product)
2. Input arguments (a, b)
3. Output arguments (prod)

These three parts are collectively called the function's signature. If you are given a function signature, you are not allowed to change the function's signature. That is, you are not allowed to change the type or order of the input or output parameters, and you are not allowed to change the function name, as this will interfere with grading.

The name of the first function inside a MATLAB M-file MUST EQUAL the name of the M-file (minus the .m part). Thus, the first function inside the M-file “inner_product.m” must be called “inner_product”. You can have more functions with any name after the first function in the same M-file.

What should I name my files when I turn in my assignments

You will be given the function signature. For example, if given

```
%Input
%   a, b: two numbers
%Output
%   prod: the product of a and b
%Example
%   demo_product(4, 5) gives 20
function [prod] = demo_product(a,b)
    code here
end
```

then, you must submit a file named “demo_product.m” with this exact spelling and use of lower-case letters.

Basic MATLAB programming ideas

We already covered functions above. A function is a block of code that takes inputs (like numbers, vectors, matrices, etc), and returns a result (other numbers, vectors, matrices, etc).

The other basic ideas you should be conformable with are “loops” and “if statements.” If these ideas sound new, please read chapter 3 in this guide:

http://research.vtu.ac.in/Downloads/materials/**matlab_guide**.pdf

How will I be graded?

Ok, lets say the function signature was

```
%Input
%   a, b: two numbers
%Output
%   prod: the product of a and b
%Example
%   demo_product(4, 5) gives 20
function [prod] = demo_product(a,b)
    code here
end
```

1st) I'm going to type into matlab “your_ans = demo_product(5,20);”

2nd) I'm then going to ignore everything that is printed to the screen. You may print stuff (say de-bug statements you use when writing your answer), but I will not look at it.

3rd) I'm then going to look at “your_ans” and assign a grade.

How can I get zero credit?

There are many ways you can get zero credit other than not turning things in. They may include

1. Printing results to the screen instead of returning results via the output parameter.
2. Not catching any errors or exceptions.
3. Infinite loops.
4. If your function takes more time than what is reasonable, otherwise I assume you have an infinite loop.
5. Not closing “if” and “for” statements resulting in bad logic.
6. Changing the function signature or using different case-letters.
7. Turning in a function that does not work. Always check your work for correctness before turning it in.