Wednesday Lecture !

PROGRAMMING

WHAT PEOPLE THINK I DO

WHAT MY MOTHER THINKS

WHAT MY FRIENDS THINK I DO

WHAT MY TEACHER THINKS

WHAT I THINK I DO

```
1  Program
2
3  Begin
4
5
6
7  End.
```

WHAT I ACTUALLY DO

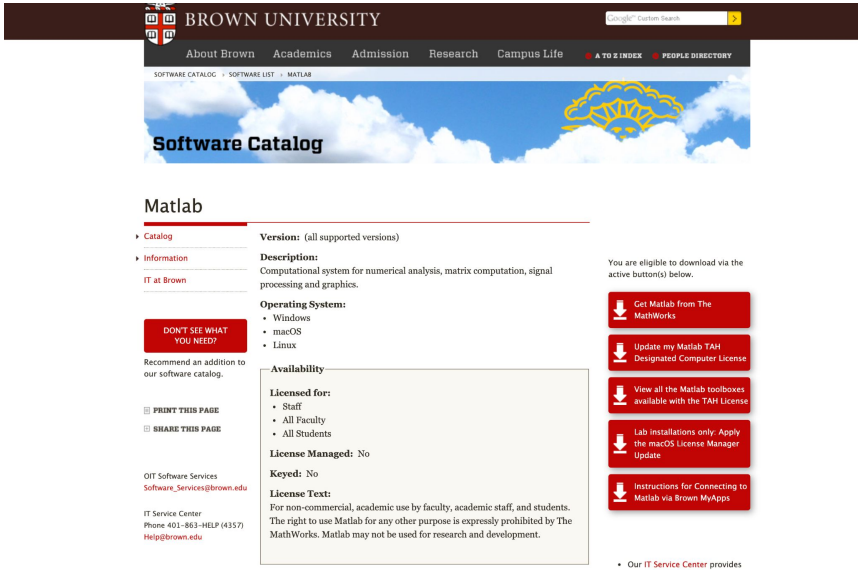
Agenda

1. Let us take some steps back.
2. Super quick intro to matlab
3. Types of data
4. Logic operands and relations
5. Problem

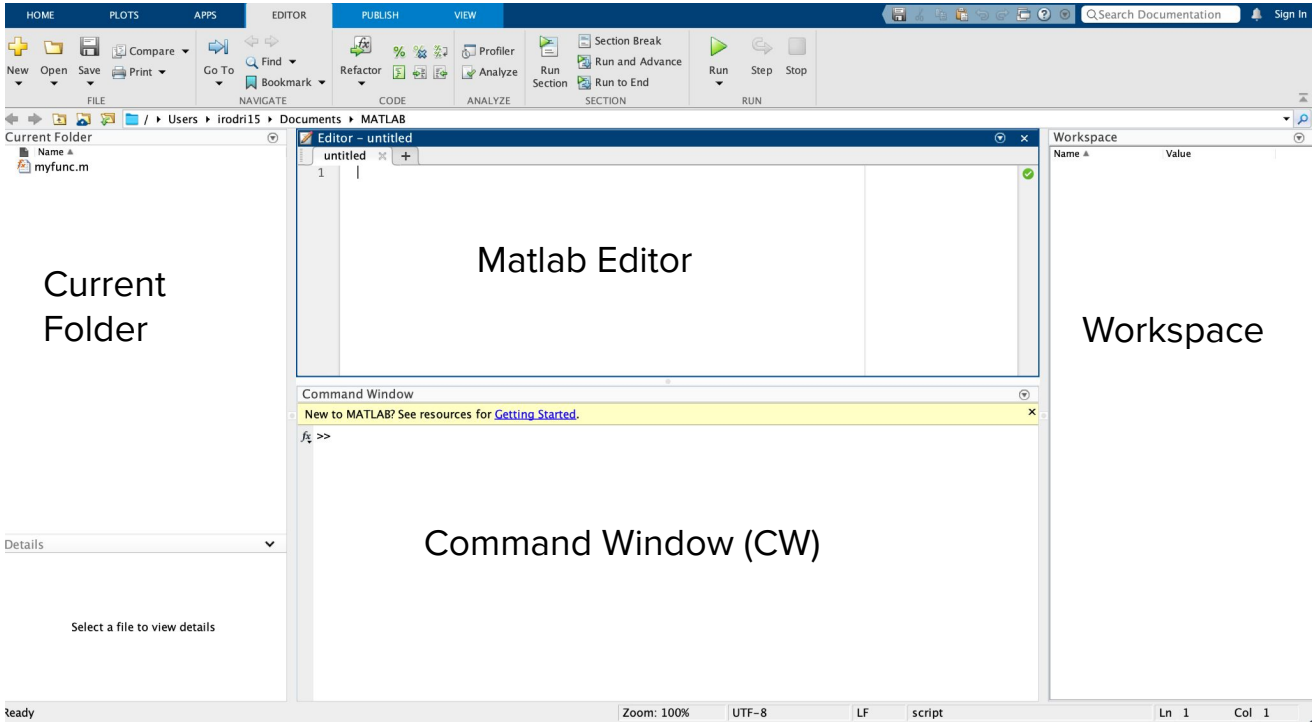
Let us take some steps back...

Where to get matlab?

Go to software.brown.edu and search for matlab



What to expect when opening matlab?



Useful commands:

- what : List all **m-files** in current directory
- dir/ls : List **ALL** files in current directory.
- pwd: Show the current directory path
- who : List all known variables
- whos : List all know variables plus their size
- clear : Clear variables from workspace
- clc : Clear the command view (in mac: Command+k)
- **why : PLEASE TRY THIS ONE!**

M- files

- An M-file might be used as a script, i.e. file consist set of statements
- In additional, one use M-files to write function, in this case the file starts with function definition like:
  - function y = f(x)
  - function [u,v] = f(x,y,z)
- File name and the name of function in the file are usually identical, however while they are different, **MATLAB use file name to call function**.
- If you add additional function in same M-file, it considered sub-function and might be called from inside the M-file only. **Only the first function might be called from outside.**

Type of Variables

Is important to be aware of the distinction

between type of variables. In general you will find:

- Double
- Char (strings)
- Boolean
- Arrays

Use the command **whos** to find about some variable

Type.

```
>> x = 5

x =

     5

>> whos x
  Name      Size            Bytes  Class     Attributes

  x         1x1                 8  double

>> x = 'five'

x =

    'five'

>> whos x
  Name      Size            Bytes  Class    Attributes

  x         1x4                 8  char

>> y = false

y =

  logical

   0

>> whos y
  Name      Size            Bytes  Class     Attributes

  y         1x1                 1  logical

>>
```

Examples:

x = 1 ; Define an scalar

y = [1 2 3] Defines a vector with three positions

z = [1;2;3] Defines a column vector

A= [1 2 3; 4 5 6; 7 8 9] Defines a matrix

v= ‘String’

t = [‘a’,’b’]

Logical Operands and relations

OPERANDS

- &,&& (AND)
- | , || (OR)
- ~ (NOT)
- xor (Exclusive OR)

In matlab:

1 is True

0 is False

Actually any number is True, except 0.

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Actually any number is True, except 0.

Let's play: What it is?

- (1&0)&(1|1)&(1)&(1)
- 1||(0&0)& xor(1,0)
- a= 1, b= 0
- a & ~a
- b || ~b
- ~(a &b)
- ~a | ~b

Logical Operands and Relations

Relations

- == Equal
- > more than,
- < less than
- <= less or equal
- >= more or equal
- ~= different

Now we can combine logical operands and relations

- ~((3>5) & (2>4))
- (5>3)||(3==(1+2))