

# CS 105

Introduction to Scientific Computing

Lecture #2 – Basics of MATLAB

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# ASSIGNMENT 1

- Goals
  1. Ensure you have Matlab working
  2. Make sure you can do a proper submission to Canvas
  3. Practice doing some computations in the Matlab command window
  4. Use the *ans* variable for later computations
- All assignments are due by Sundays 11:55pm unless otherwise specified
- Many of you may be able to complete them during your lab session
  - Which is mandatory, attendance will be taken

# SKILLS WE'LL NEED

- How to type computations in the Matlab command interface
- How to write certain operations
  - Multiplication
  - Exponents
  - Fractions
- How to re-use prior computations

# TOPICS

1. Data Types
2. Operators
3. Matlab Expressions

# READING

- Section 1.3-1.4

# DATA TYPES

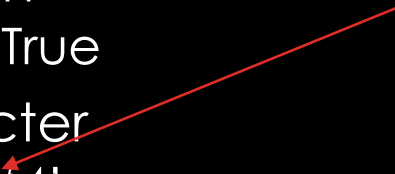
- Obviously we want to be able to represent various types of things in a computer.
- What sort of things might this be?
  - Numbers
  - Letters
  - Groups of Numbers
  - Groups of Letters

# BASIC DATA TYPES

- There are many types of numbers
  - Integers
  - Decimal-Point
  - Binary
- In Computer Science we typically call these
  - Integers
  - Doubles (or floats)
  - Booleans
- Non numerical values (i.e letters, symbols) are typically called *characters*.
  - In MATLAB we use single quotes around characters.

# BASIC TYPES IN MATLAB

- Integer
  - EX: 3
- Double
  - EX: 3.0
- Binary
  - EX: 1
- Boolean
  - EX: True
- Character
  - EX: '4'
- String
  - EX: 'hello'



Note single quote  
This is different than the  
*number 4*



# OPERATORS

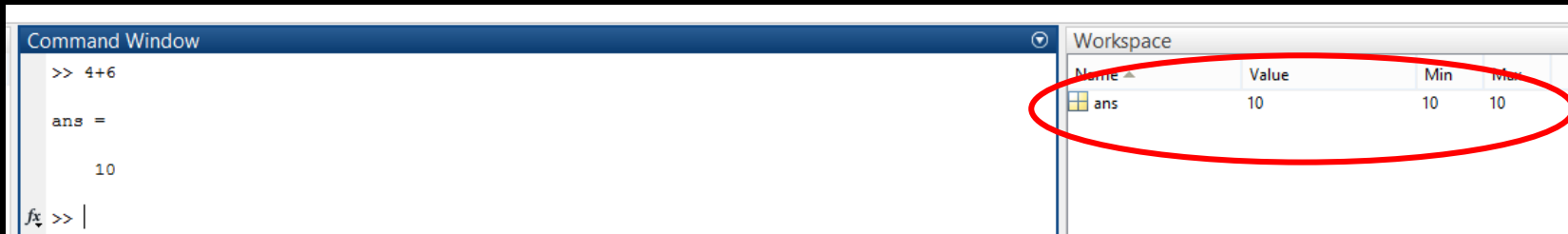
- You can use the standard mathematical operators
  - $+$ ,  $-$ ,  $*$ ,  $/$
- To do exponents we use the *carat* symbol
  - $\wedge$
- Multiplication **MUST BE EXPLICIT**
  - Matlab doesn't understand  $(2)(3)$ 
    - Must be  $(2)*(3)$
- You can enforce order of operations using parenthesis
  - $(2^3)/(2+8)$

# WRITING MATH EXPRESSIONS

- Now we can easily do computations in the Matlab Command Window

# THE ANS VARIABLE

- You may notice when you did a computation something appeared in the *Workspace*



- It's a *variable* called *ans*
- You can use it for later computations
  - `ans^2;`

# CLEANING UP STUFF

- We'll finish with two special *commands* that allow you to clean up your Matlab workspace
  - `clc`
    - This clears out all the stuff in the Command Window (`clc` = clear command window)
  - `clear all`
    - This removes all variables from the workspace
    - You could also do *clear ans* to just remove the *ans* variable

# MATLAB HELP

- I lied, one more thing...
- Often we want *help* to figure out what commands do
- Matlab has robust help/documentation
  - You can either type *help* then the command
    - `help clc`
  - Or you can go to the *Search Documentation* area on the top-left

