



PROGRAMMING SESSIONS

02

User input / Fundamental MATLAB classes
'assert' / 'for' statement

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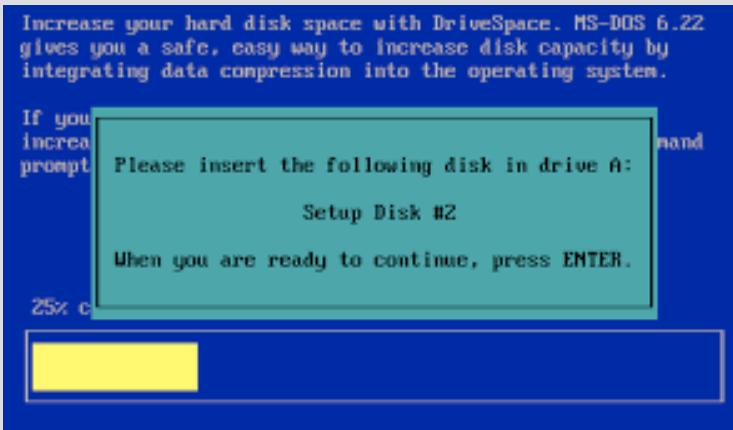
PROGRAM

Some basic concepts

- Input – prompt
- Object, Type and Variables – Variable definition
- Operations and operators

MATLAB programming

- Fundamental MATLAB classes
- How to prompt the user for input
- Assertion, why is it useful?
- Flow control, for statement
- Now that we can do I/O we can write our first useful program



BASIC CONCEPTS INPUT - PROMPT

In session-01 we created a basic program that wrote to the screen or text file. It does **output**. However, useful programs generally produce results based on some **input** given to them. Together output and input are known as **I/O**.

When we encourage the user to enter an input (take an action) we call it a **prompt**.

BASIC CONCEPTS

OBJECTS, TYPE & VARIABLES

- To store input we need a place in the computer's memory to place it:
 - ” An **object** is a region of memory with a **type** that specifies what kind of information can be placed in it. A named object is called a **variable**.” Stroustrup – Programming... (2nd edition)
- A **statement** that introduces a new variable is called a **definition**

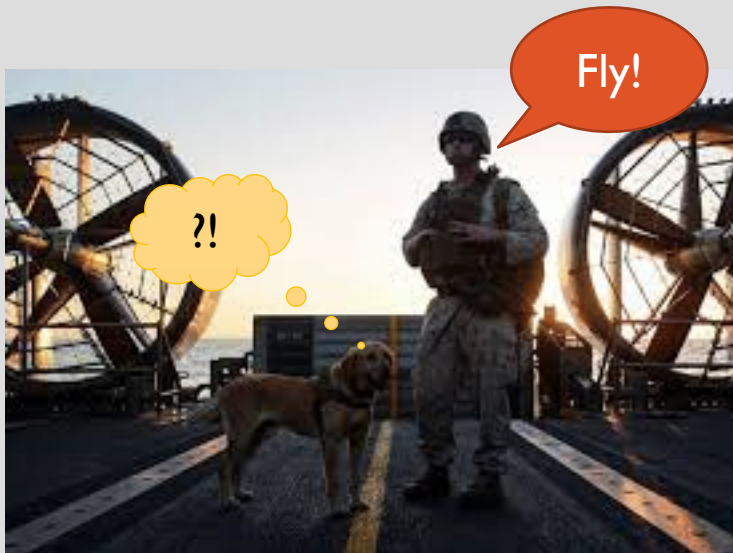
Variable



BASIC CONCEPTS

OPERATIONS AND OPERATORS

- The **type** of a **variable** defines what kind of information can be placed into the **object**. Moreover, it also defines which **operations** can be applied to the **variable** and they mean.



Operation	double	char	string
assignment	=	=	=
addition	+	++ Cast to double	++ Cast to double
concatenation	cat; []	cat; []	cat; []
greater than	>	>	>* Dimensions must agree

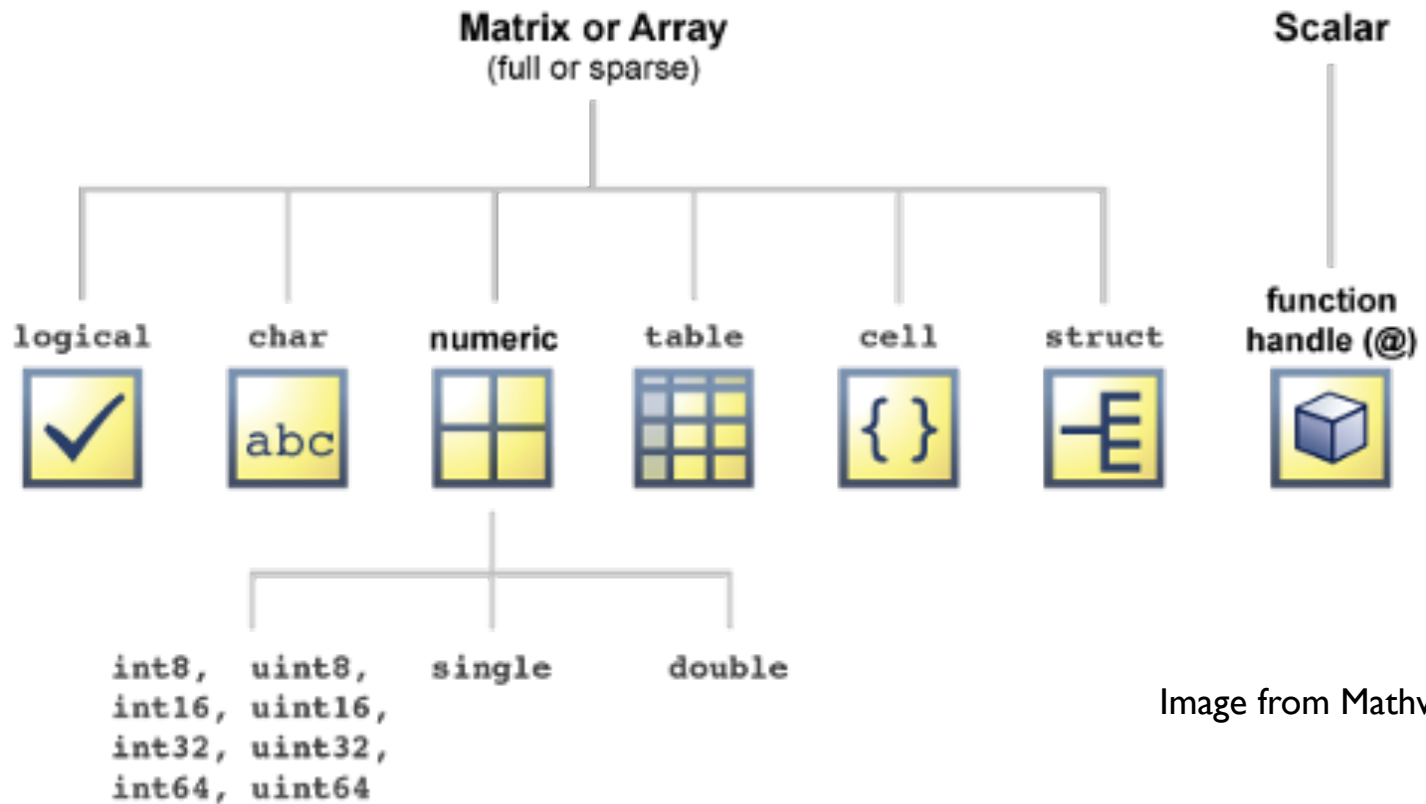


Image from Mathworks

FUNDAMENTAL MATLAB CLASSES

MATLAB

HOW TO PROMPT THE USER

We will first concentrate in receiving data (input) from the user via the keyboard. Later on we will explore other ways a program can receive input.



The functions we will explore today are:

- input
- inputdlg

ASSERTION

Why is assertion important:

Extract from wikipedia:

“Programmers can use assertions to help specify programs and to reason about **program correctness**. For example, a **precondition**—an assertion placed at the beginning of a section of code—determines the set of states under which the programmer expects the code to execute. A **postcondition**—placed at the end—describes the expected state at the end of execution.”

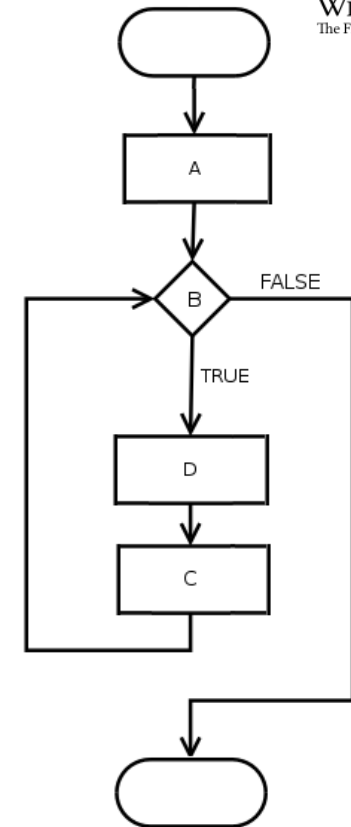


FLOW CONTROL

For loops are used for iteration:
repeating a part of code several times.
In MATLAB a basic for loop looks like:

```
for i=1:10  
    disp(num2str(i))  
end
```

for(A;B;C)
D;



NOW LETS CODE

Let there be code!