IMPORTANT SYMBOLS

% comment for humans

clear, clc, close built in MATLAB commands

; suppresses output to command window

ARITHMETIC

/ right division

\ left division

\*+- normal commands

Scalars only

Arrays and scalars

DISPLAY FORMAT

Arrays = fundamental form of MATLAB, stores information

1D arrays = vectors, list of numbers arranged in row or column

R = 2i + 4j + 5k

r\_A = [2 4 5] row vector, can use space or comma

Reference by rows then columns in MATLAB

r\_A has dimensions 1,3

r\_A = [2;4;5] column vector

semicolon either suppresses output or terminates row

Create vector with constant spacing:

Name = [M : Q : N]

M = first term

Q = spacing, default is 1 if left out

N = last term

Just don’t do anything like [1 : 2 : 100]

Create vector with linear spacing:

Name = linspace(xi , xf , n)

xi = first element

xf = final element

n = number of elements

2D arrays = matrices

m x n matrix has m rows and n columns

var = [first row element: second row element: etc.]

all rows must contain same number of elements!

‘ flips rows and columns, aka inverse matrix

Array addressing:

For vectors: v = [35 46 72 92]

Want only the third term v(3) =

Paren for addressing and can set as new variable

v(2:4) = 3 replaces elements 2 through 4 of the vector with 3

For matrices: address rows and columns

mat(m,n) where m is row and n is column

Scalars:

Matrix addition and subtraction

Multiplication and division with matrices

Element by element operations:  
.\* multiplication

./ right division

.^ exponentiation

Don’t need the dot with scalars!

Start (circle)

Get input (parallelogram)

Does input make sense (diamond)

NO redirects flow back to input.

Yes -> do something (rectangle)

Ask user if they want plot

YES plots and NO skips part of program

END

Relational and Logical Operatives:

Relational:

Relational operators (less than, greater than, equal, etc)

If you put one = sign, it is the assignment operator. Need == for comparison

All result in 1 or 0 (true or false, respectively)

If 2 arrays are compared, it is done element by element.

A = B

B == A returns array of all 1

B(1,2) == A returns all 1 except for a 0

If a scalar is compared to an array -> array comparing at each element of array

Logical:

&& and -> A && B If both are true (meaning “1”), result is true. If not, result is false.

A && B is result of operation.

|| (shift \) or -> A || B If one or both are true, the result is true. Otherwise, both are false -> false.

~ not -> This thing is almost never needed. Just flip your relational operator to avoid this command.

~ (3>4) = TRUE

~A just means that the thing talked about isn’t A. NOT gives opposite statement

~(TRUE) = FALSE

Full Order of Precedents:  
1) Paren

2) Exponent

3) logical ~

4) mult and division

5) add and subtraction

6 relational operators

7) &&

8) ||

Conditional Statements:

IF, THEN, ELSE

IF condition is true, do stuff, example if a < 10 && b > 5

end

If grade > 90

Display (‘congrats’)

end

Standard Symbols:  
OVAL start/end

ARROW connectors

PARALLELOGRAM I/O

RECTANGLE process

DIAMOND decision

OVAL welcome

ARROW

PARALLELOGRAM get # from user

DIAMOND is number positive

NO -> PARALLELOGRAM number is negative

YES -> PARALLELOGRAM number is positive

OVAL end

If [statement is true]

Do something

Elseif [statement is true]

Do something 2

Elseif [statement is true]

Do something 3

Else [statement is…] (optional)

Do something else

End

Only need n-1 statements.

Whenever you make program flow decisions, you need n-1 statements where n = number of decisions.

For end loops = execute pre-determined # of times

For I = F : S: T

I = loop index variable

F = value of I during 1st pass

S = value of I on last pass

T = value of I on increment pass

Oval (start)

Rectangle (define)

Diamond (k = 0 : n-1)

true

Rectangle (calculate term value) y = y + k

MATLAB automatically updates k

Red circles are break points

While Loop

While [ conditional statement time ] % variable in statement must be declared.

End

While continues executing until statement becomes false

Oval (start)

Rectangle (set z)

End false while (z <= 15) true z = 2z

Zurcher, Jessica D., et al. “Parenting and Cyberbullying Across Adolescence.” *CyberPsychology, Behavior & Social Networking*, vol. 21, no. 5, May 2018, pp. 294–303. *EBSCOhost*, doi:10.1089/cyber.2017.0586.