

Relational and Logical Operators



Relational Operators in MATLAB

(Boolean Operators)

Relational Operator	Description
<	LESS Than
<=	LESS than or EQUAL to
>	GREATER than
>=	GREATER than or EQUAL to
==	EQUAL to
~=	NOT EQUAL to

- **TRUE** conditions are represented by nonzeros (typically "1")
- **FALSE** conditions are represented by zero "0"
- Can work on scalars, vectors or matrices!



Logical Operators in MATLAB

Combining Relational Operators

Logical Operator	Description
&	AND
	OR
~	NOT



EXAMPLE: Data Analysis

Generate a vector of random numbers between one and one hundred. Determine what percentage of these numbers are between 40 and 60.

How many numbers did it take for the answer to get a consistent answer?

Repeat this to determine what percentage are between 90 and 95



Some Useful MATLAB Functions

Comparing Array Contents

- `any(var)` returns true (1) if *any* of the elements in `var` are nonzero
- `all(var)` returns true (1) if *all* of the elements in `var` are nonzero
- `find(var)` returns the *indices* where `var` is nonzero
- `isequal(var1, var2)` returns true (1) if the two arrays are equal.



More Useful Functions

Making life simpler?

- Getting more info about arrays
 - ▶ $L = \text{length}(x)$ Returns length of x . For VECTORS only!
 - ▶ $[m,n] = \text{size}(A)$ returns number of rows (m) and columns (n) in A
- See page 15 of text...
 - ▶ $\cos()$ $\sin()$ $\tan()$ $\text{sqrt}()$ $\text{exp}()$ $\log()$ $\log_{10}()$
 - ▶ $\text{abs}()$ $\text{ceil}()$ $\text{floor}()$ $\text{round}()$ $\text{mod}()$

