Relational & Logical Operators,

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relational expression, Boolean expression, logical expression, relational operators, logical operators, truth table

Relational Operators

- Relational operators take two operands and return true/false.

Operator	Meaning
>	greater than
<	less than
>=	greater than or equals
<=	less than or equals
==	equality
~=	inequality

Examples

- 3 < 5

ans = 1 (logical) ← true

- 2 > 9

ans = 0 (logical) ← false

- 'a' < 'c'

ans = 1 (logical)

- a = 3<5; a+10

ans = 11

Scalar Logical Operators

- Logical Operators take one/two logical operands and return a true/false

```
3<5 && 15>10  %true
3<5 && 15<10  %false
~(3<5)        %false
```

Operator	Meaning
||	or (for scalars)
&&	and (for scalars)
~	not

- Additionally xor(x,y) function returns true if one and only one of its arguments is true.

```
xor(3<5, 'a'<'c')   %false
xor(3<5, false)     %true
```

Truth Tables

- Truth Table lists the output of a function/operator for all values of its inputs.

Table 3.1 Truth Table for Logical Operators

x	y	~x	x || y	x && y	xor(x,y)
true	true	false	true	true	false
true	false	false	true	false	true
false	false	true	false	false	false

Truth Table Example

- Create a truth table for x && y && ~x

Table 5.1 Operator Precedence Rules

Operators	Precedence
parentheses ( )	highest
transpose and power ', ^, .^	
unary: negation (–), not (~)	
multiplication, division *, /, \, .*, ./, .\	
addition, subtraction +, –	
colon operator :	
relational <, <=, >, >=, ==, ~=	
elementwise and &	
elementwise or |	
and &&	
or ||	
assignment =	lowest

Exercise 3.1 A : R L

- 4>3 +1
- 'e'=='d' +1
- 3 < 9 - 2
- (3 < 9) - 2
- 4 == 3 + 1 && 'd' > 'c'
- 3 >= 2 || x == 'y'
- xor(3 >= 2, 'x' == 'y')
- xor(3 >= 2, 'x' ~= 'y')
- x=0; 3 < x < 5
- choice='n'; choice == 'y' || 'Y'