Topics：Max \＆min，branching
Reading：CFile 1 Sec 1.3

## Max \＆Min

Consider the quadratic function $q(x)=x^{2}+b x+c$ on the interval $[L, R]$ ：
$Q_{1}$ ：Which is smaller，$q(L)$ or $q(R)$ ？
$Q_{2}$ ：What is the minimum value of $q(x)$ in $[L, R]$ ？

```
% Fragment 1
    qL= L^2 + b*L + c; % q(L)
    qR= R^2 + b*R + c; % q(R)
```

    --ーーー-ー-ー-ー---------
    fprintf('qL less than \(q R \backslash n ')\);
    fprintf('qR less than or equal to \(q L \backslash n ')\);
    
## Relational Operators

| Operator | Meaning |
| :---: | :--- |
| $>$ | greater than |
| $>=$ | greater than or equal to |
| $==$ | equal to |
| $\sim=$ | not equal to |
| $<=$ | less than or equal to |
| $<$ | less than |

```
% Fragment 2
    qL= L^2 + b*L + c; % q(L)
    qR= R^2 + b*R + c; % q(R)
    if (
        disp('qL equals qR');
    ---------------------
        disp('qL less than qR');
    else
        fprintf('qR less than or equal to qL');
    end
```

Consider the quadratic function $q(x)=x^{2}+b x+c$ on the interval $[L, R]$ ．What if you only want to know if $q(L)$ is close to $q(R)$ ？

```
% Fragment 3
    tol= 1e-9; % tolerance
    qL= L^2 + b*L + c; % q(L)
    qR= R^2 + b*R + c; % q(R)
    if ( abs(qL-qR) < tol )
        disp('qL is close to qR');
    end
```


## Simple if construct

## if Condition

Statements to execute if the condition is true else

Statements to execute if the condition is false end

## The even simpler if construct

if Condition<br>Statements to execute if the condition is true end

## The if construct

if Condition 1
Statements to execute if the condition 1 is true elseif Condition 2

Statements to execute if the condition 2 is true $\vdots$
else
Statements to execute if all previous conditions are false end

## Rules of the if construct


-
 else clause

- $\qquad$ elseif clauses

Consider the quadratic function $q(x)=x^{2}+b x+c$ on the interval $[L, R]$.
What are the critical points?
What do we do with the critical points in order to find the minimum value of $q(x)$ in $[L, R]$ ?

