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

Max & Min

Consider the quadratic function $q(x) = x^2 + bx + c$ 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)
```

fprintf('qL less than qR\n');

```
fprintf('qR less than or equal to qL\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 $q(x) = x^2 + bx + c$ 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</pre>
```

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 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

Statements to execute if the condition 2 is true

: else

Statements to execute if all previous conditions are false \mathbf{end}

Rules of the if construct

- _____ branch of statements is executed
- _____else clause
- _____elseif clauses

Consider the quadratic function $q(x) = x^2 + bx + c$ 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]?