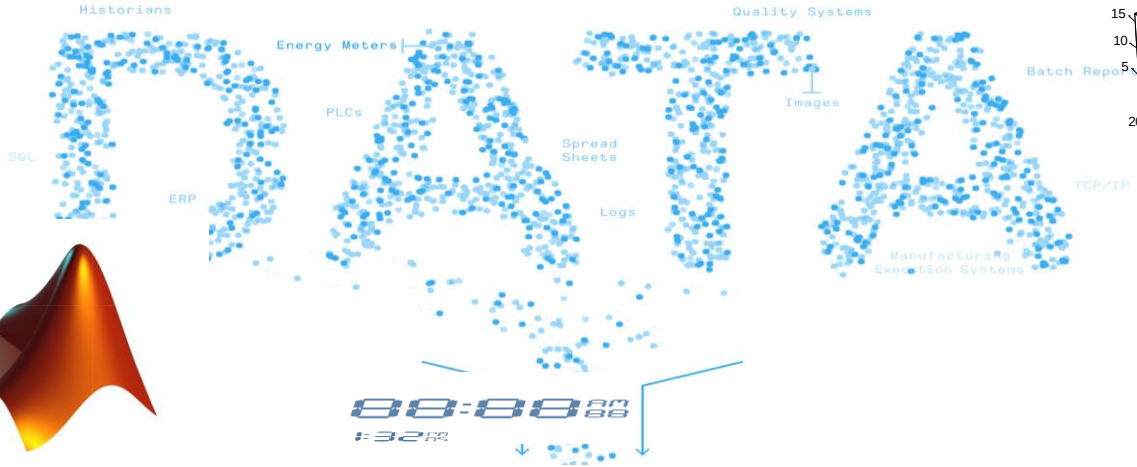
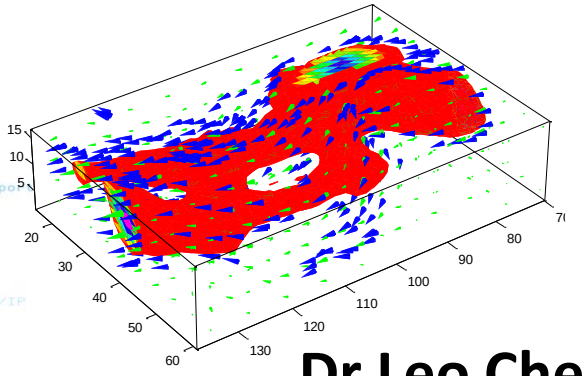
MATLAB Fundamental Laboratory Handbook (MATLAB)

Chapter 5 Loop Statements





Dr Leo Chen
leo.chen@ieee.org

5. 1 Lab

Objective: Practice **for loop** statement.

Content: Calculate the sum of odd numbers between 1 and 100.

```
sum = 0; % Initialization parameter

for i = 1:2:100
sum = sum +i;
End
sum
```

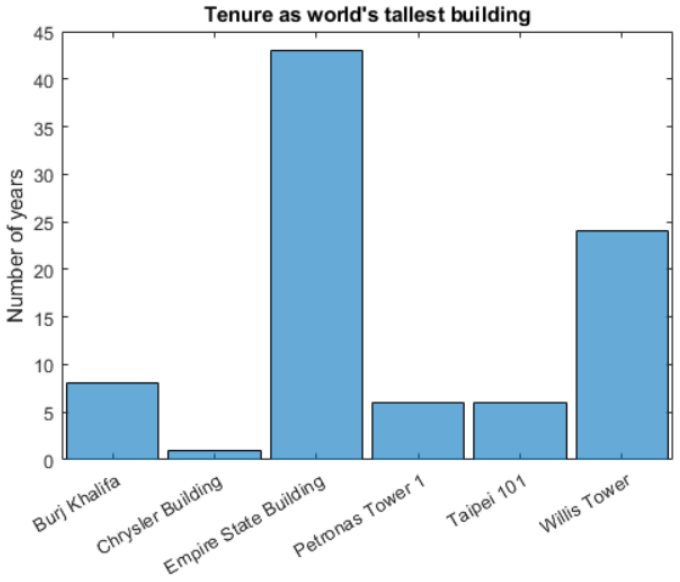
5. 2 Lab

Objective: Practice **for loop** statement

Content:

1. Start with tallBuildingRecord_template.

2. Modify the script to use a loop to determine the tallest building in each year



5. 3 Lab

Objective: Practice **nested for loop** statement.

Content:

Step 1. Randomly generate an integer matrix A with 3 rows and 5 columns in the range [1,5];

Step 2. Randomly generate an integer matrix B with 5 rows and 2 columns in the range [1,5];

Step 3. Calculate matrix A*B with nested for loop to obtain the result C;

Step 4. Calculate the matrix D=A*B directly.

5. 4 Lab

Objective: Practice while **loop** statement

Content: Enter a number of numbers from the keyboard, end the input when 0 is entered, give the average of these numbers and their sum.

```
msum=0;
n=0;
x=input('Enter a number (end in 0):');
while x~=0
msum=msum+x;
n=n+1;
x=input('Enter a number (end in 0):');
end

if n>0
fprintf('sum=%f\n',msum);
mean=msum/n;
fprintf('mean=%f\n',mean);
end
```

5. 5 Lab

Objective: Practice **loop** through vector and for timing

Content:

Step 1. i is A natural number from 1 to 10^7, calculate A(i) = sin(i)*cos(i) with for loop, and record the running time of the for loop;
Step 2. Use matrix method to realize A(i) = sin(i)*cos(i), and record the calculation time.

```
clear
% with for loop
tic
for i = 1 : 10^7
A = sin(i) * cos(i);
end
t1 = toc
% with matrix method
B = zeros(1, 10^7);
tic
j = 1 : 10^7
B(1,j) =sin(j) .* cos(j);
t2 = toc
```