Matlab Lecture 4

Programming in MATLAB

INPUT/OUTPUT

- *input* command pauses the program and prompts the user for input
- *disp, fprintf* commands show the output to the command window
- You can format the output as you like with *fprintf* command

Input command

- You can assign a value to a variable using the *input* command
- *x = input('Enter the value of the distance in cm:')*
- MATLAB will displays the text inside the ' ' and waits for the user to type the value
  - *Enter the value of the distance in cm:*
- Type the value (say 5) and hit Enter key
- If the input command does not end with a ; then MATLAB will displays

```
x =

     5
```

Output Commands

- *disp(x)*: will return the numerical value of *x*
- *disp('Hello')*: will display *Hello*
- *fprintf('The value of x is:', x)*: will return same as above
- *fprintf('The temperature is %f degrees F', x)*: will return
  The temperature is 120.4 degrees F

Field Format

- %f decimal or integer notation
- %e exponential notation
- \n next line
- %8.3f total 8 digits, 3 digits after decimal point (Exp. If x = 100.897899, MATLAB will display 100.897
- %2.0f total 2 digits, nothing after decimal point (Exp. If x = 32, MATLAB will display 32

```
x = 30; y = 40;
fprintf('The range is %3f to %3f \n', x, y);
```

- \r carriage return, \t tab, \b backspace,

Create a table with fprintf

```
time = [0:2:10];
distance = ½ * 9.81* time.^2;
% matrix of the output data
Table = [time ; distance];
fprintf('Distance Traveled in free fall \n');
fprintf('Time in sec          Distance in meter \n');
fprintf('%3.0f       %10.3f \n', Table);
```

Check: x = [1 2; 3 4 ; 5 6]; fprintf('%2f %2f \n', x);

If statement

- Logical operators

<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to
==	equal to
~=	not equal to
&	and
|	or
~	not

If, else and elseif

```
if time  >=  0
   distance =  v * time;
   fprintf('Distance is %f for time %f \n', distance, time);
end
```

```
if G < 50
    disp('Fail');
else
     disp ('Pass');
end
```

```
grade = input('The numerical grade of the student: ');
if grade > 90
    disp(' Letter grade A');
elseif grade > 80
    disp(' Letter grade B');
elseif grade > 70
    disp(' Letter grade C');
elseif grade > 60
    disp(' Letter grade D');
else
     disp(' Letter grade F');
end
```

For loop

```
N = input('Enter a positive integer:');
fact = 1;
for k = 1:N
    fact = fact * k;
end
fprintf('The factorial of %4.0f is %10.0f \n', N, fact);
```