

**Input from keyboard:**

```
speed = input('input speed');
```

**Input from file:**

```
fid = fopen('data.txt','r'); % open file named data.txt for reading
a = fscanf(fid,'%g\n'); % read column vector from file into vector a
fclose(fid); % close file
```

**Output:**

```
disp('speed = '); % writes the character string between the single quotes to the screen
disp(speed); % writes the value of the variable named speed to the screen
fprintf('speed = %6.3g\n',speed);
```

**Looping:**

```
for i = 2 : -1 : -2 % example: for i = 1:5
    statements; % x = x + i;
end % end

while (condition) % example: x = 0;
    statements; % while (x < 5)
end % x = x + 1
% end
```

**Logic:**

```
if (condition)
    statements;
elseif (condition)
    statements;
    statements;
elseif (condition)
    statements;
else
    statements;
end

item = input('input item number');
switch item
    case 1
        disp('item = 1');
    case 2
        disp('item = 2');
    case 3
        disp('item = 3');
end
```

**Relational Operators:**

```
equals ==
not equal ~=
less than <
greater than >
greater than or equal to >=
less than or equal to <=
```

**Logical Operators:**

```
and &&
or |
not ~
```

**Function call:**

[a,b,c] = function\_name(x,y,z) % sends x, y and z to the function. Function returns a, b and c.

**Function definition:**

```
function [a,b,c] = function_name(x,y,z)
```

**2<sup>nd</sup> Order Polynomial Curve Fit:**

$$\begin{bmatrix} N & \sum x & \sum x^2 \\ \sum x & \sum x^2 & \sum x^3 \\ \sum x^2 & \sum x^3 & \sum x^4 \end{bmatrix} \begin{bmatrix} a_0 \\ a_1 \\ a_2 \end{bmatrix} = \begin{bmatrix} \sum y \\ \sum xy \\ \sum x^2 y \end{bmatrix}$$