Functions

Built-in Functions

1. **magic() :** magic(n) returns an n-by-n matrix constructed from the integers 1 through n^2 with equal row and column sums. The order n must be a scalar greater than or equal to 3 in order to create a valid magic square.
2. **sum():** Provides sum of a series. For eg. sum(1:10)
3. **diag():** Returns diagonal of a matrix.
4. **Trigonometry Functions:**
    a. cos(): cosine
    b. sin(): sine
    c. tan(): tangent
    d. csc(): Cosecant
    e. sec(): Secant
    f. cot(): Cotangent
    g. deg2rad: Convert angle from degrees to radians
    h. rad2deg: Convert angle from radians to degrees
5. Specific Special functions:
    a. log(): Natural logarithm
    b. log10(): Common logarithm (base 10)
    c. log2(): `log2(X)` computes the base 2 logarithm of the elements of X such that $2^Y=X$.
    d. sqrt(): Square root
    e. pi: Gives the value of pi

User defined Functions

User defined functions are the functions created by the users according to their needs.

Syntax : function [a1,…,an] = func(x1,…,xm)
func is the function name
a1,…,an are outputs
x1,…,xm are inputs
Function name is required, whereas input and output arguments are optional.

For making a user defined function in MATLAB, go to Home -> New -> Function.

Program:

```
function f = fact(n)
    f = 1;
    i = 1;
    while i <= n
        f = f * i;
        i = i + 1;
    end
end
```

Save the program as fact.m
Then call in the command window with parameter

fact(5)

Output:

```
>> fact(5)

ans =

   120
```