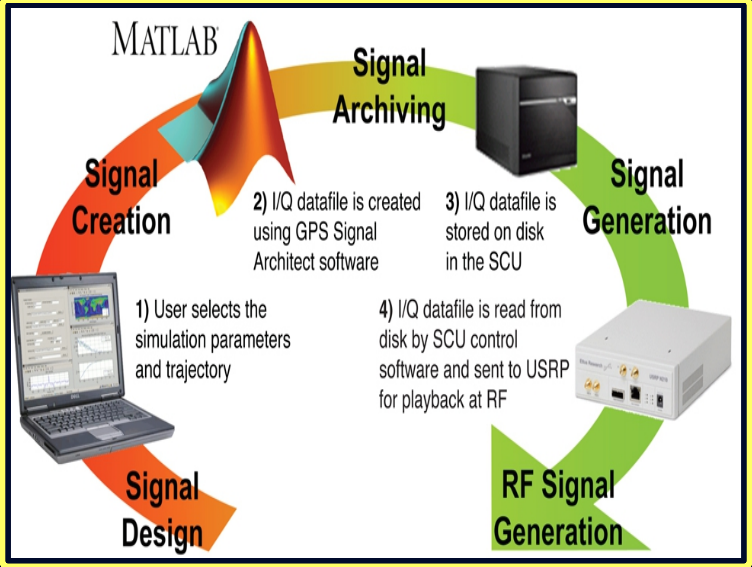
BASIC CONCEPTS OF MATLAB

Chandigarh Group of Colleges

SIGNAL PROCESSING



MATLAB VARIABLES

> SCALAR : A=5

> VECTOR : [2,3,4]

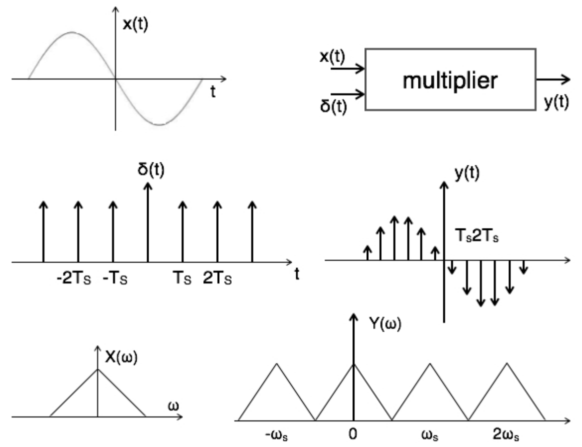
> MATRICES : [ ]

Z TRANSFORM OF BASIC SIGNALS

$u(n)$	$\frac{Z}{Z-1}$
$u(-n-1)$	$-\frac{Z}{Z-1}$
$\delta(n-m)$	z^{-m}
$a^n u[n]$	$\frac{Z}{Z-a}$
$a^n u[-n-1]$	$-\frac{Z}{Z-a}$
$n\,a^n u[n]$	$\frac{aZ}{\|Z-a\|^2}$
$n\,a^n u[-n-1]$	$-\frac{aZ}{\|Z-a\|^2}$
$a^n \cos\omega n u[n]$	$\frac{Z^2-aZ\cos\omega}{Z^2-2aZ\cos\omega+a^2}$
$a^n \sin\omega n u[n]$	$\frac{aZ\sin\omega}{Z^2-2aZ\cos\omega+a^2}$

Process of Sampling

Sampling of input signal x(t) can be obtained by multiplying x(t) with an impulse train δ(t) of period T_s. The output of multiplier is a discrete signal called sampled signal which is represented with y(t) in the following diagrams:



Convolute two sequences x[n] = {a,b,c} & h[n] = [e,f,g]

LINEAR CONVOLUTIION

	a	b	c
e	ea	eb	ec
f	fa	fb	fc
g	ga	gb	gc

Convoluted output = [ea, eb+fa, ec+fb+ga, fc+gb, gc]

Note: if any two sequences have m, n number of samples respectively, then the resulting convoluted sequence will have [m+n-1] samples.

CORRELATION BETWEEN 2 SIGNALS

$$\int_{-\infty}^{\infty} x_1(t)x_2(t-\tau)dt$$