

# Signal Processing Using Scilab

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# Introduction

- What is a signal?
- A signal is any time-varying or spatial-varying quantity.

# Learning Objectives

In this tutorial we will learn:

- To show the operations on or analysis of signals, in either discrete or continuous time domain.

# Different types of Signals

- Plotting continuous and discrete sine wave.
- Plotting Step function.
- Plotting Ramp function.

# Convolution

In this slide i am going to describe Convolution

- Linear convolution of two vectors by using the inbuilt command `convol()`.

# Discrete Fourier Transform

In this slide i will be describing Discrete fourier transform for a discrete sequence by using the inbuilt command `dft()`.

## Calling Sequence

```
[xf]=dft(x,flag);
```

- `x` :input vector
- `flag`: value is -1 for DFT.
- `xf`: output vector

# Inverse Discrete Fourier Transform

In this slide i will be describing Inverse Discrete fourier transform for a discrete sequence by using the inbuilt command `dft()`.

## Calling Sequence

```
[x]=dft(xf,flag);
```

- `xf` :input vector.
- `flag`: value is 1 for IDFT.
- `x`: output vector.

In this slide i will be describing how to calculate discrete fourier transform and inverse discrete fourier transform by using the inbuilt function `fft()`.

## Calling Sequence

```
[x]=fft(a);
```

# Correlation

In this slide i will be showing how to calculate the correlation between two vectors by using inbuilt command `corr()`

## Calling Sequence

```
Rx1x2 = corr(x1,x2,n)
```

- `x1,x2`:Input vectors
- `n`:No.of correlation terms.

# Sampling

In this slide i will be demonstrating Resampling of a given signal using `intdec()`

## Calling Sequence

```
[y]=intdec(x,lom)
```

- `x` :input data sequence.
- `lom`: This is a scalar that gives a rate change.

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- Discrete fourier transform for a discrete sequence by using the inbuilt command `dft()`.
- The inverse discrete fourier transform can be found by using the same inbuilt command `dft()`.
- Correlation between two signals by using inbuilt command `corr()`.
- Resampling of a given signal using `intdec()`.

# Textbook Companion

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