**Parameters:**

* It means that as size(t) returns two values it is an array. Hence, we don’t want rows will only store the columns of this array. {size(t) = 1 1001, thus size\_t = 1001}.
* Phi = linspace(0,2pi,300). How it works?

Linspace creates linearly spaced vector from 0 to 2pi with 300 points and 299 segments. Thus, each segment will be 2pi-0/299.

Values will be like:  
0, 0.02101,0.04202,0.06303,….6.28

* Similarly, z = linspace(0,L,10) will be 0, 14.4e-3,28.8,..130e-3.
* Theta points are more than phi points. Like theta here is 1\*10001 but phi is lesser 1\*300. But why did we put phi lesser?
* Vm here is peak value of phase voltage (as 36 V is line voltage rms).
* N = 1, is nothing.
* theta\_inductance will be an array of size 1\*10001(size\_t).

**Initialization of matrices:**

* Meaning of Labcsr = zeros(3,3,size\_t).

Labcsr, Labcrs will be zero matrix with array of size equal to size\_t. Each element of it will be a matrix of dimension 3\*3.

Eg : x = zeros(3,3,2). Elements of this array are x(:,:,1) = and x(:,:,2) =

* length(X) returns the length of vector X. It is equivalent to MAX(SIZE(X)) for non-empty arrays.

Eg: x is matrix of dimension (2,3). Then size (x) is 2 \*3. Then max(size(x)) is 3.

* Turns\_phases and winding\_phases will be such that first row will be for stator and other row will be for rotor. That’s why first row you put size (1,phi\_size) and second row will be of size (size\_t,phi\_size).

## 

## **Calculate air gap length:**

## Concept is motor is segmented into 1000 parts. Shift is calculated for each segment and 1001 points. But actually, we want to segment our motor into 10 small motors . But for that in 10 motors also air gap length is changing and is not constant. Thus, in the code after shift at each point is calculate 10 segments are done from 0-101, 101-201, 201-301,…901-1001.For each segment (0-101) inductance is calculated and thus is stored.

## Finally, we get G\_seg of size 300\*101. Which stores air gap length of each of the 101 segments.

## Query?

Why the size of G\_across\_shaft is 300\*1001. Why this 300. Can’t it be 1\*1001?

## **Turns Function and winding function:**

## The basic syntax of repmat is:

## Matlab code:

## B = repmat(A, m, n)

## Here, A is the array you want to replicate, m is the number of times you want to repeat A vertically (row-wise), and n is the number of times you want to repeat A horizontally (column-wise). The result is stored in B

## Example: >> A = [1 2; 3 4]

## A =1 2

## 3 4

## >> B = repmat(A, 2,3)

## B =

## 1 2 1 2 1 2

## 3 4 3 4 3 4

## 1 2 1 2 1 2

## 3 4 3 4 3 4