Exp - 03

Formation of Bus Admittance Matrix

Aim:

To form the Y-Bus admittance matrix of a given Bus system using MATLAB program

Apparatus Required:

SI.No	Apparatus	Specification
1	PC	Dual core, RAM 512 MB 1.2 GHz speed, 80 GB
2	MATLAB	7.5

Theory:

Bus admittance matrix is often used in power system studies in most of power system studies it is necessary to form Y-bus matrix of the system by considering certain power system parameter depending upon the type of analysis. For example in load flow analysis it is necessary to form Y-bus matrix without taking into account the generator impedance and load impedance.

In short circuit analysis the generator transient reactance and transformer impedance taken in account, in addition to line data. Y-bus may be computed by inspection method only if there is no natural coupling between the line shunt admittance are added to the diagonal elements corresponding to the admittance.

The dimension of Y-bus matrix is n X n where n is the number of buses in a power system network, each bus is connected only to two other buses. So the Y-bus of the large network is high is properly not evident in small systems. But in system where there are hundreds of buses the speed is high it may be of 99% hence by applying separate technique numerical computation storage required may be drastically reduced.

Algorithm:

Step 1: Start the program

Step 2: Get the number of buses in problem

Step 3: Get the impedance value between the buses

Step 4: Calculate the admittance value by the reciprocal of impedance Y = 1/Z

Step 5: Calculate elements of bus admittance matrix

Step 6: For diagonal element (i==j)

$Y(I,j) = \sum_{?=1}^{?} ? (?, ?)$

Step 7: For non-diagonal element ($i \neq ?$)

$Y(i,j) = -Y(I,j)$

Step 8: Display the Y-bus Matrix

Step 9: Stop the execution

Program:

```
clear all;
clc;
n=input('Enter the no of buses=');
for i=1:n
   for j=1:n
      fprintf('Enter the impedance value between %d & %d is=',i,j);
      z(i,j)=input('=');
      y(i,j)=1/z(i,j);
   end
end
z
y
Y(n,n)=0;
for i=1:n
   for j=1:n
      if i==j
         for k=1:n
            Y(i,j)=Y(i,j)+y(i,k);
         end
      else
         Y(i,j)=-y(i,j);
      end
   end
end
disp('Bus Admittance Matrix is::');
Ybus=Y
```

Result: