

Contoh aplikasi load-flow menggunakan gauss-seidel yang dijalankan pada VPL on Moodle.

Suatu sistem tenaga listrik, terdiri dari lima bus dan empat line. Dua buah bus terhubung dari masing-masing generator dan ke dua bus beban dan ke bus ke-5 sebagai swing-bus. Empat buah line impedance masing-masing :

$$Z_0 = 0.05 + j 0.1$$

$$Z_1 = 0.05 + j 0.05$$

$$Z_2 = 0.15 + j 0.2$$

$$Z_3 = 0.04 + j 0.12$$

diketahui data real-power dan voltage magnitude generator

Bus 1 : real power 1, voltage 1.05 per unit

Bus 2 : real power 1, voltage 1.00 per unit

diketahui real dan reactive power

Bus 3 : real power -0.9 per unit, reactive power 0.0

Bus 4 : real power -1.0, reactive power -0.2 per unit.

Contoh script ini dapat dijalankan menggunakan compiler octave pada jail server VPL.

```
%simple application of load flow using gauss-seidel method.
```

```
Z1=.05+j*.1;
```

```
Z2=.05+j*.05;
```

```
Z3=.15+j*.2;
```

```
Z4=.04+j*.12;
```

```
%Ini adalah node-incidence matrix
```

```
NI=[1 0 0 0;0 0 0 1;-1 1 1 0;0 0 -1 -1;0 -1 0 0];
```

```
%Ini adalah vector dari voltage magnitudes
```

```
VNM=[1.05 1 0 0 1]';
```

```
%dan vector dari sudut tegangan
```

```
VNA=[0 0 0 0 0]';
```

```
%
```

```
KNM=[1 1 0 0 1]';
```

```
KNA=[0 0 0 0 1]';
```

```
%
```

```
KUM=1-KNM;
```

```
KUA=1-KNA;
```

```
%data beban yang positif untuk yang masuk network
```

```
%nol untuk yang tidak diketahui
```

```
P=[1 1 -.9 -1.0]';
```

```
Q=[0 0 0 -.2 0]';
```

```
%vector untuk check error
```

```
PC=[1 1 1 1 0]';
```

```
QC=[0 0 1 1 0]';
```

```
Check=KNM+KNA+PC+QC;
```

```
%P & Q vector yang tidak diketahui
```

```
PU=1-PC;
```

```
QU=1-QC;
```

```
fprintf('Matrix line admittance:\n');
```

```
Y=[1/Z1 0 0 0;0 1/Z2 0 0;0 0 1/Z3 0;0 0 0 1/Z4]
```

```
%Matrix node-admittance
```

```

fprintf('Matrix admittance bus\n')
YN=NI*Y*NI'
%beberapa nilai awal untuk voltage magnitude dan sudut
VM=[1.05 1 .993 .949 1'];
VA=[.0965 .146 .00713 .0261 0]';
%mulai loop perhitungan
Error=1;
Tol=1e-10;
N=length(VNM);
%besaran tegangan
VMAG=VNM.*KNM+VM.*KUM;
VANG=VNA.*KNA+VA.*KUA;
7V=VMAG.*exp(j.*VANG);
%mulai perhitungan power
I=(YN*V);
PI=real(V.*conj(I));
QI=imag(V.*conj(I));
%
while(Error>Tol);
for i=1:N,
%Run through all of the buses
%yang dihitung berdasar busnya
if (KUM(i)==1)&(KUA(i)==1),
%besaran magnitude dan sudut tegangan tidak diketahui
pvc=(P(i)-j*Q9i)/conj(V(i));
for n=1:N,
if n ~=i,pvc=pvc-(YN(i,n)*V(n));end
end
pv=pvc/YN(i,i);
V(i)=VM(i)*exp(j*angle(pv));
end
end %check error
%perhitungan arus
I=(YN*V);
%untuk error checking dan perhitungan power
PI=real(V.*conj(I));
QI=imag(V.*conj(I));
%Convergen dan mendekati kondisi yang diharapkan.
PERR=(P-PI).*PC;
QERR=(Q-QI).*QC;
Error=sum(abs(PERR).^2+abs(QERR).^2);
end
fprintf('Here are the voltages\n')
V
fprintf('Real Power\n')
P
fprintf('Reactive Power\n')
Q

```

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ADMINISTRATION

Console: connection closed (Running: 9 seg)

```

Columns 1 through 3:
 4.00000 + 0.00000i  0.00000 + 0.00000i  0.00000 + 0.00000i
 0.00000 + 0.00000i 10.00000 - 10.00000i  0.00000 + 0.00000i
 0.00000 + 0.00000i  0.00000 + 0.00000i  2.40000 - 3.20000i
 0.00000 + 0.00000i  0.00000 + 0.00000i  0.00000 + 0.00000i

Column 4:
 0.00000 + 0.00000i
 0.00000 + 0.00000i
 0.00000 + 0.00000i
 2.50000 - 7.50000i

And here is the bus admittance matrix
YB =
Columns 1 through 3:
 4.00000 - 0.00000i  0.00000 + 0.00000i  -4.00000 + 8.00000i
 -less -- (f)orward, (b)ack, (q)uit
 Jail: execution time limit reached.

```

MOODLEserver [Running]

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ADMINISTRATION

Console: connection closed (Running: 8 seg)

```

V =
 1.04500 + 0.101531i
 0.98915 + 0.146891i
 0.99329 + 0.007361i
 0.94907 + 0.025521i
 1.00000 + 0.00000i

Real Power
P =
 1.00000
 1.00000
 -0.90000
 -1.00000
 0.00000

Reactive Power
Q =
 0.00000
 -less -- (f)orward, (b)ack, (q)uit
 Jail: execution time limit reached.

```

VPL 3.1.3