



**MÜHENDİSLİK VE DOĞA BİLİMLERİ FAKÜLTESİ
ELEKTRİK-ELEKTRONİK MÜHENDİSLİĞİ BÖLÜMÜ**

**EEM-0412
2020-2021 Bahar Dönemi**

**GÜÇ SİSTEMLERİ SİMÜLASYONU
Ödev #1**

Dersin Sorumlusu
Dr. Öğr. Üyesi İbrahim Gürsu TEKDEMİR

Adı - Soyadı: Hüseyin EREN	RAPOR NOTU /100
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İmza:	Rapor Teslim Tarihi: 28.04.21

Önsöz : Bu raporda $P_2=155$ MW , $Q_2=250$ MVar $P_3= 495$ MW ve $Q_3 = 0$ MVar alınmıştır.

1) Matlab Analizi :

```
V1 = 1.05 + 0i;  
V2 = 1 + 0i;  
V3 = 1 + 0i;  
  
P2 = -1.55; Q2 = -2.50;  
P3 = -4.95; Q3 = 0;  
  
y12 = 1/(0.02 + 0.04i);  
y13 = 1/(0.01 + 0.03i);  
y23 = 1/(0.0125 + 0.025i);
```

V1,V2,V3,P2,P3,Y12,Y13,Y23 fonksiyon ve değerleri girilmiştir.

▼ Workspace			
::Name	::Value	::Size	::Class
 P2	-1.5500	1×1	double
 P3	-4.9500	1×1	double
 Q2	-2.5000	1×1	double
 Q3	0	1×1	double
 V1	1.0500	1×1	double
 V2	1	1×1	double
 V3	1	1×1	double
 y12	10.0000 -2...	1×1	double (co...
 y13	10.0000 -3...	1×1	double (co...
 y23	16.0000 -3...	1×1	double (co...

HOME PLOTS APPS EDITOR PUBLISH FILE VERSIONS VIEW

New Open Save Go To Find Refactor Run Section Break Run and Advance Run Step Stop

FILE NAVIGATE CODE SECTION RUN

Current Folder: gss1b.m, gss1a.m, Published (my file)

Workspace:

Name	Value	Size	Class
P2	-1.5500	1x1	double
P3	-4.9500	1x1	double
Q2	-2.5000	1x1	double
Q3	0	1x1	double
V1	1.0500	1x1	double
V2	0.9688 - 0.0046i	1x1	double (complex)
V3	0.9796 - 0.0732i	1x1	double (complex)
y12	10.0000 - 3.0000i	1x1	double (complex)
y13	10.0000 - 3.0000i	1x1	double (complex)
y23	16.0000 - 3.0000i	1x1	double (complex)

Command Window: New to MATLAB? See resources for Getting Started.

V2 =
0.9688 - 0.0046i

V3 =
0.9796 - 0.0732i

14 UTF-8 LF script Ln 2 Col 52

HOME PLOTS APPS EDITOR PUBLISH FILE VERSIONS VIEW

New Open Save Go To Find Refactor Run Section Break Run and Advance Run Step Stop

FILE NAVIGATE CODE SECTION RUN

Current Folder: gss1b.m, gss1a.m, Published (my file)

Workspace:

Name	Value	Size	Class
P2	-1.5500	1x1	double
P3	-4.9500	1x1	double
Q2	-2.5000	1x1	double
Q3	0	1x1	double
V1	1.0500	1x1	double
V2	0.9383 - 0.0064i	1x1	double (complex)
V3	0.9558 - 0.1061i	1x1	double (complex)
y12	10.0000 - 3.0000i	1x1	double (complex)
y13	10.0000 - 3.0000i	1x1	double (complex)
y23	16.0000 - 3.0000i	1x1	double (complex)

Command Window: New to MATLAB? See resources for Getting Started.

>> gss1b

V2 =
0.9383 - 0.0064i

V3 =
0.9558 - 0.1061i

>>

14 UTF-8 LF script Ln 2 Col 52

```
>> abs(V2),angle(V2)*180/pi
```

```
ans =
```

```
0.9406
```

```
ans =
```

```
-4.0488
```

```
>>
```

```
>> abs(V3),angle(V3)*180/pi
```

```
ans =
```

```
0.9617
```

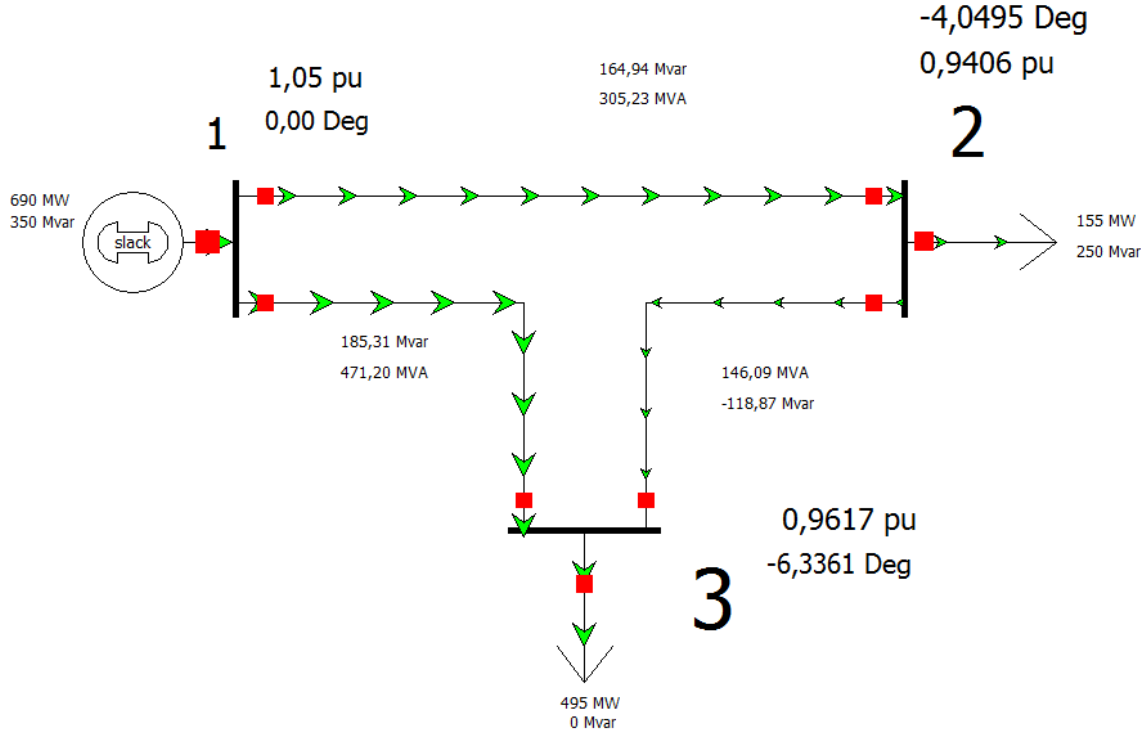
```
ans =
```

```
-6.3356
```

```
>>
```

İşlemler Sonucunda 2 nolu bara için -4.04 Deg ve 0.9406 pu değerleri , 3 nolu bara için 0.9617 pu ve -6.3356 Deg değerlerini elde ettim.Daha sonra Powerworld Analizine geçtim.

1-) PowerWorld Analizi



Powerworld analizi sonucunda 2 nolu bara için -4.0495 Deg ve 0.9406 pu değerleri, 3 Nolu Bara için 0.9617 pu ve -6.3361 Deg değerlerini elde ederek matlab analizi sonucumla powerworld simülasyonu sonucumu karşılaştırdım ve aynı sonuçları elde ettiğimi gördüm.

2-a (üç-faz) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Bus

Sort by: Name Number

1 (1) [138.0 kV]
2 (2) [138.0 kV]
3 (3) [138.0 kV]
4 (FaultP) [138.0 kV]

Bus Records Lines Generators Loads Switched Shunt Buses Y-Bus Matrices

From Number	From Name To Number	To Name	Circuit	X/mtr	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1	2	2	1	NO	2,18139	2,18139	2,18139	2,18139	2,18139
2	1	3	3	1	NO	2,51741	2,51741	2,51741	2,51741	2,51741
3	2	3	3	1	NO	1,77371	1,77371	1,77371	1,77371	1,77371

Fault Location: Bus Fault In-Line Fault

Fault Type: Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location %: 50

Fault Current: Scale Current By: 1,00000

Fault Impedance: R: 0,00000 X: 0,15

If Magnitude: 3,523 p.u. Subtransient Phase Current: A 3,523 -49,23 deg. B 3,523 -169,23 deg. C 3,523 70,77 deg.

If Scaled Mag: 3,523 p.u. If Angle: -49,23 deg.

Units: p.u. Amperes

2-b (Faz-Toprak) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Bus

Sort by: Name Number

1 (1) [138.0 kV]
2 (2) [138.0 kV]
3 (3) [138.0 kV]
4 (FaultP) [138.0 kV]

Bus Records Lines Generators Loads Switched Shunt Buses Y-Bus Matrices

From Number	From Name To Number	To Name	Circuit	X/mtr	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1	2	2	1	NO	1,71054	1,39563	1,31510	1,71054	1,39563
2	1	3	3	1	NO	3,27042	3,66692	3,02223	3,27042	3,66692
3	2	3	3	1	NO	1,62245	1,39563	1,31510	1,62245	1,39563

Fault Location: Bus Fault In-Line Fault

Fault Type: Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location %: 50

Fault Current: Scale Current By: 1,00000

Fault Impedance: R: 0,00000 X: 0,15

If Magnitude: 1,824 p.u. Subtransient Phase Current: A 1,824 -78,51 deg. B 0,000 -96,49 deg. C 0,000 -96,49 deg.

If Scaled Mag: 1,824 p.u. If Angle: -78,51 deg.

Units: p.u. Amperes

2-c (İki Faz) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Bus

Sort by: Name Number

1 (1) [138.0 kV]
2 (2) [138.0 kV]
3 (3) [138.0 kV]
4 (FaultP) [138.0 kV]

Bus Records Lines Generators Loads Switched Shunt Buses Y-Bus Matrices

From Number	From Name To Number	To Name	Circuit	X/mtr	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1	2	2	1	NO	1,49453	2,54077	1,99019	1,49453	2,54077
2	1	3	3	1	NO	3,43439	2,60814	2,63846	3,43439	2,60814
3	2	3	3	1	NO	1,49453	1,12102	2,30793	1,49453	1,12102

Fault Location: Bus Fault In-Line Fault

Fault Type: Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location %: 50

Fault Current: Scale Current By: 1,00000

Fault Impedance: R: 0,00000 X: 0,15

If Magnitude: 3,658 p.u. Subtransient Phase Current: A 0,000 0,00 deg. B 3,658 -126,77 deg. C 3,658 53,23 deg.

If Scaled Mag: 3,658 p.u. If Angle: -126,77 deg.

Units: p.u. Amperes

2-d (İki Faz-Toprak) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Bus

Sort by: Name Number

1 (1) [138.0 kV]
2 (2) [138.0 kV]
3 (3) [138.0 kV]
4 (FaultP) [138.0 kV]

Bus Records Lines Generators Loads Switched Shunt Buses Y-Bus Matrices

From Number	From Name To Number	To Name	Circuit	X/mtr	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1	2	2	1	NO	1,46637	2,54369	2,30900	1,46637	2,54369
2	1	3	3	1	NO	3,37032	2,68043	2,42295	3,37032	2,68043
3	2	3	3	1	NO	1,46637	1,36336	2,38872	1,46637	1,36336

Fault Location: Bus Fault In-Line Fault

Fault Type: Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location %: 50

Fault Current: Scale Current By: 1,00000

Fault Impedance: R: 0,00000 X: 0,15

If Magnitude: 0,994 p.u. Subtransient Phase Current: A 0,000 0,00 deg. B 3,751 -112,14 deg. C 1,679 72,73 deg.

If Scaled Mag: 0,994 p.u. If Angle: 91,39 deg.

Units: p.u. Amperes

3-a (Üç Faz) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Line

Sort by Name Number

Search For Near Bus

Select Far Bus, OCT

Fault Location

Bus Fault In-Line Fault

Fault Type

Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location % 50

Fault Impedance

R : 0.00000 X : 0.15

Fault Current

Scale Current By: 1.00000

If Magnitude: 3.639 p.u. Subtransient Phase Current

If Scaled Mag: 3.639 p.u. A 3.639 -46.58

If Angle: -46.58 deg. B 3.639 -168.58

Units p.u. Amperes C 3.639 71.42

Bus Records

From Number	From Name To Number	To Name	Circuit	X/mile	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1 1	2 2	1	NO	1.00176	1.00176	1.00176	1.00176	1.00176	1.00176
3	1 1	4 FaultR	1	NO	3.72469	3.72469	3.72469	3.72469	3.72469	3.72469
4	2 2	3 3	1	NO	1.00176	1.00176	1.00176	1.00176	1.00176	1.00176
5	4 FaultR	3 3	1	NO	1.82924	1.82924	1.82924	1.82924	1.82924	1.82924

3-b (Faz-Toprak) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Line

Sort by Name Number

Search For Near Bus

Select Far Bus, OCT

Fault Location

Bus Fault In-Line Fault

Fault Type

Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location % 50

Fault Impedance

R : 0.00000 X : 0.15

Fault Current

Scale Current By: 1.00000

If Magnitude: 1.882 p.u. Subtransient Phase Current

If Scaled Mag: 1.882 p.u. A 1.882 -78.42

If Angle: -78.42 deg. B 0.000 91.25

Units p.u. Amperes C 0.000 91.25

Bus Records

From Number	From Name To Number	To Name	Circuit	X/mile	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1 1	2 2	1	NO	1.40247	1.59839	1.30991	1.40247	1.59839	1.30991
3	1 1	4 FaultR	1	NO	3.61890	3.67318	3.01021	3.61890	3.67318	3.01021
4	2 2	3 3	1	NO	1.40247	1.59839	1.30991	1.40247	1.59839	1.30991
5	4 FaultR	3 3	1	NO	3.07396	3.67335	3.01038	3.07396	3.67335	3.01038

3-c (İki Faz) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Line

Sort by Name Number

Search For Near Bus

Select Far Bus, OCT

Fault Location

Bus Fault In-Line Fault

Fault Type

Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location % 50

Fault Impedance

R : 0.00000 X : 0.15

Fault Current

Scale Current By: 1.00000

If Magnitude: 3.796 p.u. Subtransient Phase Current

If Scaled Mag: 3.796 p.u. A 0.000 0.00

If Angle: -125.70 deg. B 3.796 -125.70

Units p.u. Amperes C 3.796 54.30

Bus Records

From Number	From Name To Number	To Name	Circuit	X/mile	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1 1	2 2	1	NO	1.49453	1.00043	1.00043	1.49453	1.00043	1.00043
3	1 1	4 FaultR	1	NO	4.63450	4.16068	3.50963	4.63450	4.16068	3.50963
4	2 2	3 3	1	NO	1.49453	1.00043	1.00043	1.49453	1.00043	1.00043
5	4 FaultR	3 3	1	NO	3.45467	0.88113	2.75357	3.45467	0.88113	2.75357

3-d (İki Faz-Toprak) :

Single Fault

Calculate Clear Clear/Close

Choose the Faulted Line

Sort by Name Number

Search For Near Bus

Select Far Bus, OCT

Fault Location

Bus Fault In-Line Fault

Fault Type

Single Line-to-Ground Line-to-Line 3 Phase Balanced Double Line-to-Ground

Location % 50

Fault Impedance

R : 0.00000 X : 0.15

Fault Current

Scale Current By: 1.00000

If Magnitude: 1.019 p.u. Subtransient Phase Current

If Scaled Mag: 1.019 p.u. A 0.000 0.00

If Angle: 91.44 deg. B 3.894 -110.14

Units p.u. Amperes C 4.856 74.28

Bus Records

From Number	From Name To Number	To Name	Circuit	X/mile	Phase Cur A From	Phase Cur B From	Phase Cur C From	Phase Cur A To	Phase Cur B To	Phase Cur C To
1	1 1	2 2	1	NO	1.40384	1.06980	0.82094	1.40384	1.06980	0.82094
3	1 1	4 FaultR	1	NO	3.36856	4.11709	4.11760	3.36856	4.11709	4.11760
4	2 2	3 3	1	NO	1.40384	1.06980	0.82094	1.40384	1.06980	0.82094
5	4 FaultR	3 3	1	NO	3.36873	1.64938	1.92616	3.36873	1.64938	1.92616