# LAMPIRAN

# Listing Program Simulasi

# dengan

# MATLAB versi 7.1

**Lampiran 1. Fungsi Alih Sistem Jacketed Stirred Tank Heater**

**Model Ruang Keadaan**

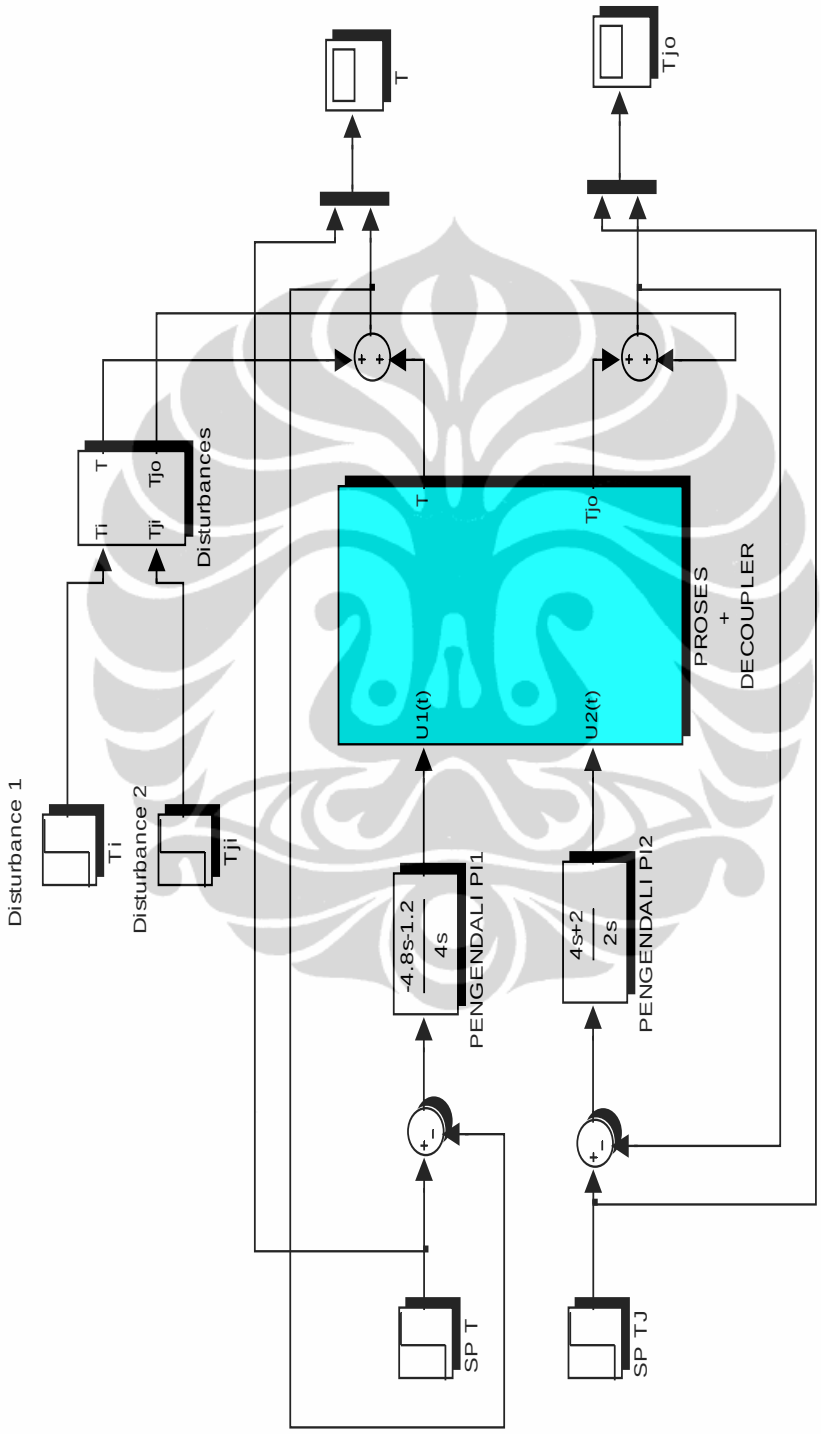
```
>> a=[-0.4 0.3;3 -4.5];
>> b=[0 -7.5 0.1 0;50 0 0 1.5];
>> c=[1 0;0 1];
>> d=[0 0 0 0;0 0 0 0];
>> a
a =
   -0.4000    0.3000
    3.0000   -4.5000

>> b
b =
         0   -7.5000    0.1000         0
   50.0000         0         0    1.5000

>> c
c =
     1     0
     0     1

>> d
d =
     0     0     0     0
     0     0     0     0
```

**Fungsi alih polynomials untuk input 1**

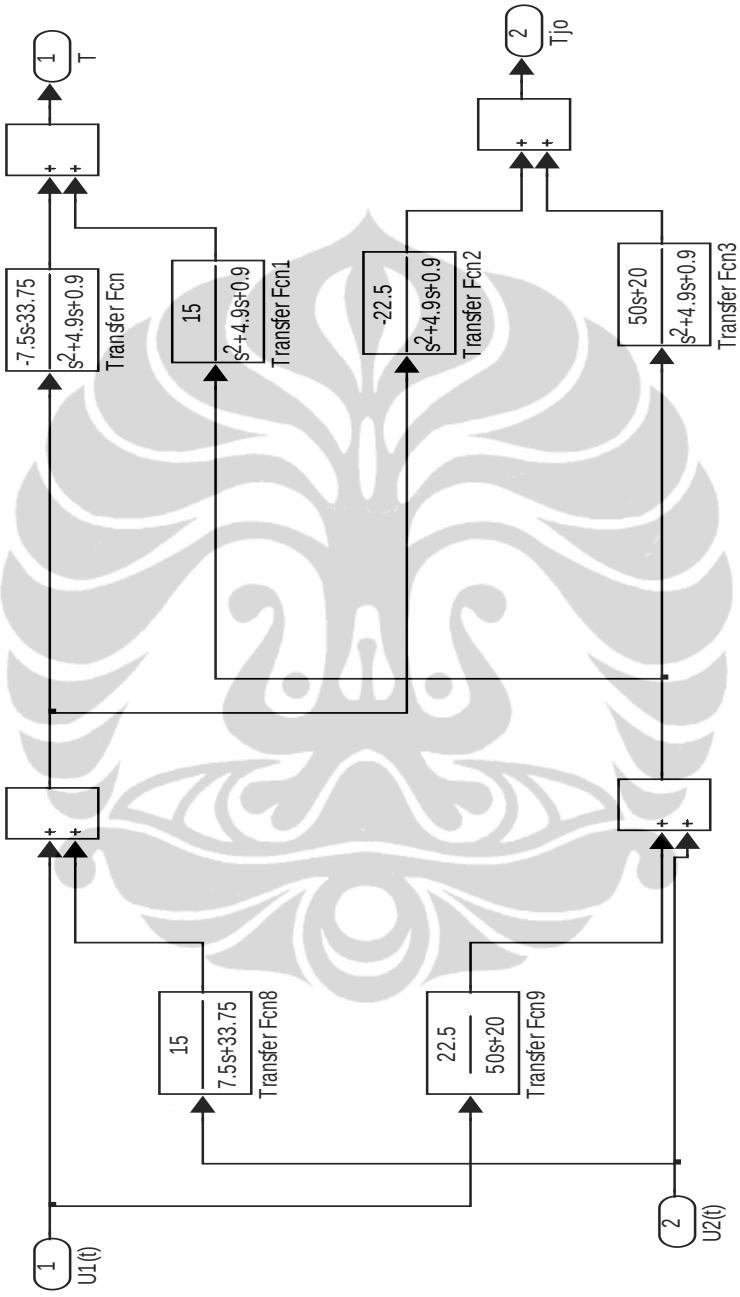
```
>> [num1,den]=ss2tf(a,b,c,d,1)
num1 =
         0   -0.0000   15.0000
         0   50.0000   20.0000

den =
    1.0000    4.9000    0.9000
```

**Fungsi alih polynomials untuk input 2**

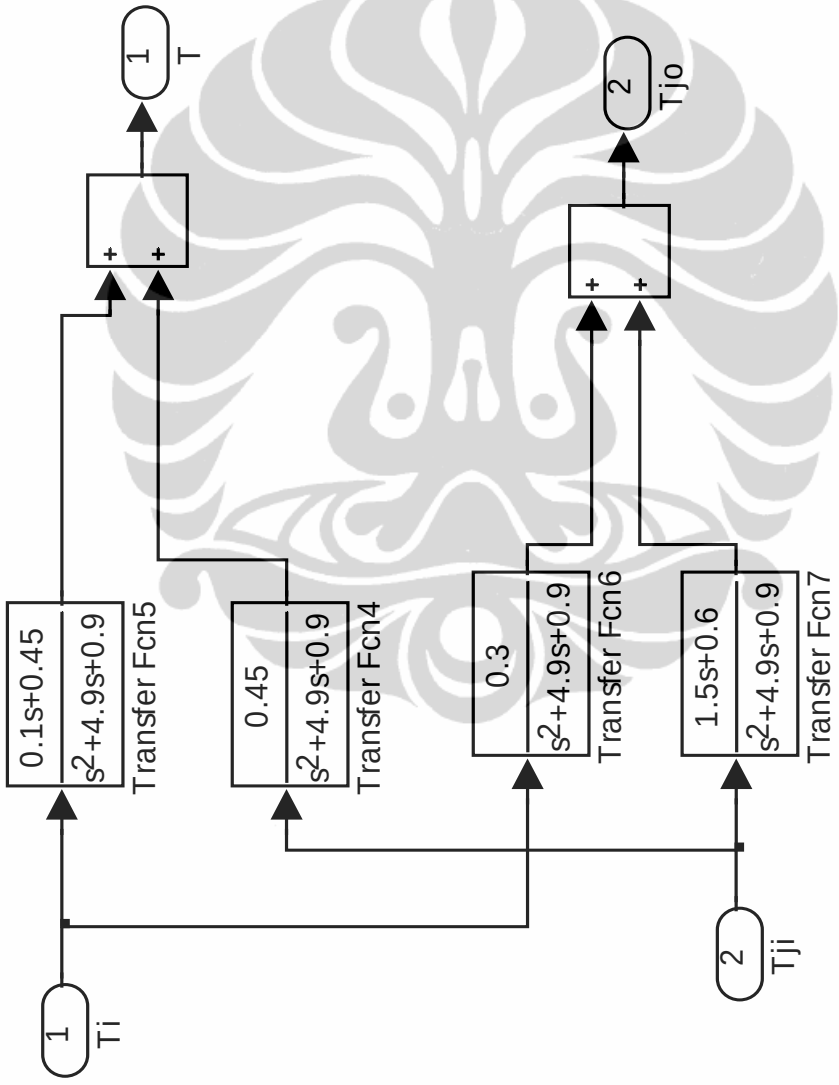
```
>> [num2, den]=ss2tf(a,b,c,d,2)
num2 =
         0   -7.5000  -33.7500
         0         0  -22.5000
den =
    1.0000    4.9000    0.9000
```


T
Tjo
Disturbances
Ti
Tji
Disturbance 1
Disturbance 2
PROSES
+
DECOUPLER
U1(t)
U2(t)
-4.8s-1.2
4s
PENGENDALI PI1
4s+2
2s
PENGENDALI PI2
SP T
SP TJ

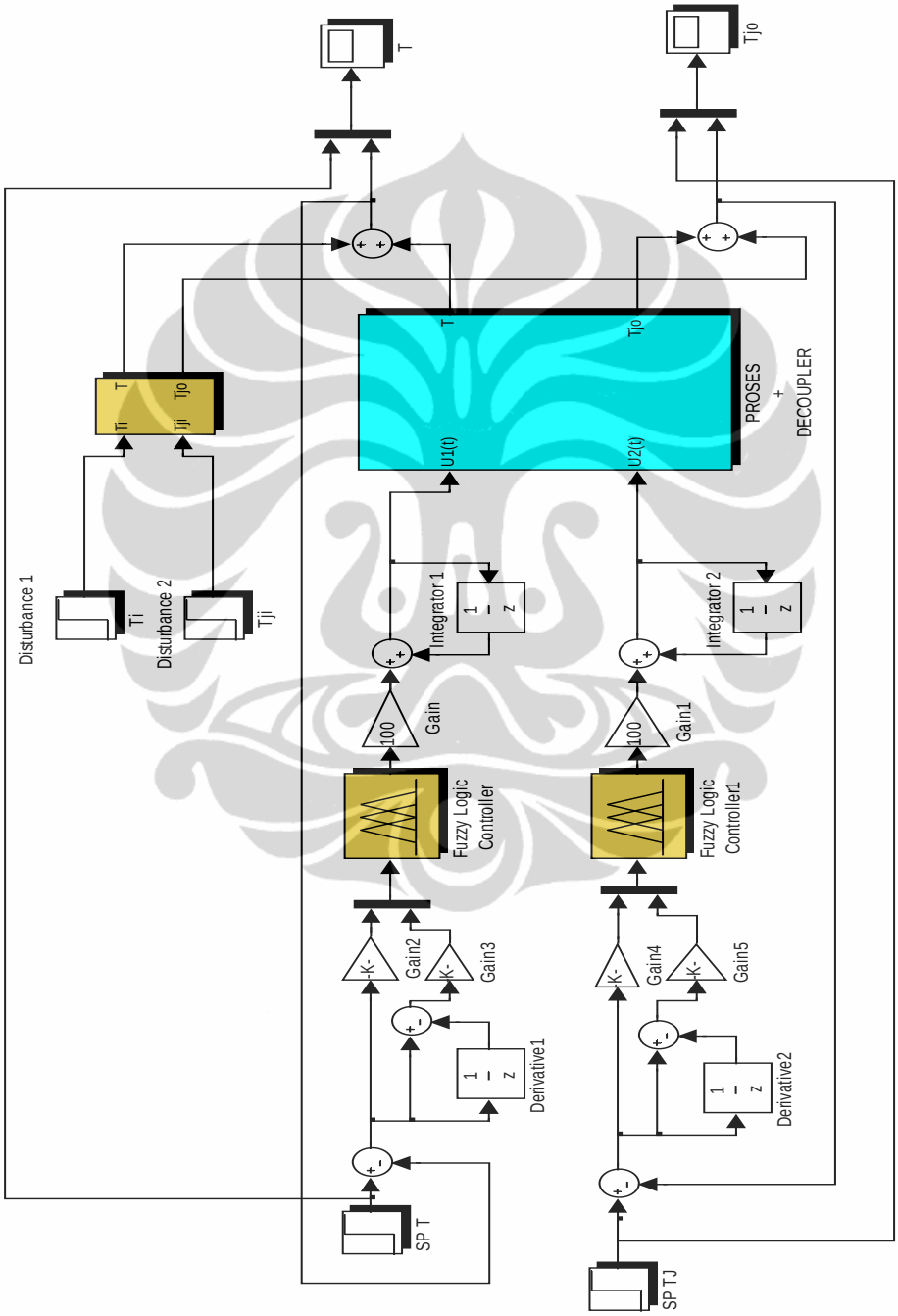
**Lampiran 2. Pengendali PI**



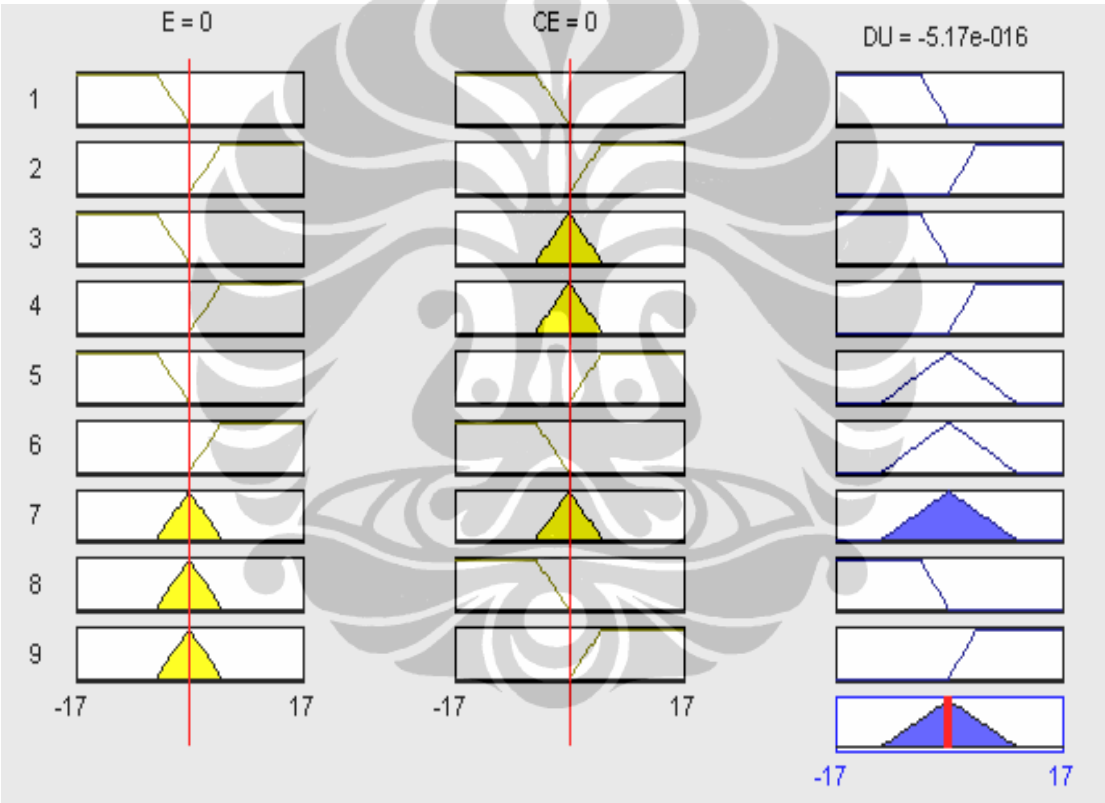

**Lampiran 3. Decoupler dan Proses**


1
Ti
0.1s+0.45
s2+4.9s+0.9
Transfer Fcn5
0.45
s2+4.9s+0.9
Transfer Fcn4
0.3
s2+4.9s+0.9
Transfer Fcn6
1.5s+0.6
s2+4.9s+0.9
Transfer Fcn7
2
Tji
1
T
2
Tjo

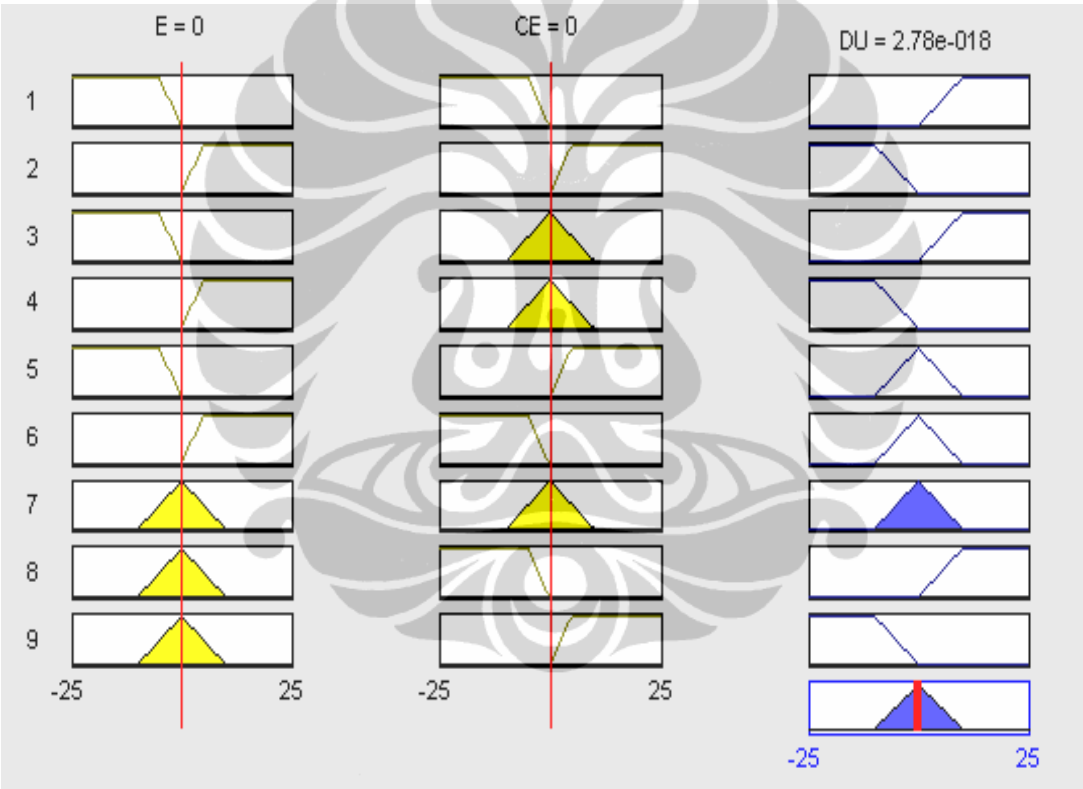
**Lampiran 4. Disturbance Ti dan Tji**




**Lampiran 5. Pengendali Fuzzy**




**Lampiran 6. Rules Temperatur Output Jaket**




**Lampiran 7. Rules Temperatur Output tangki**