DAFTAR PUSTAKA

Aldianto, Ardiansyah, dkk. 2019. *PENJADWALAN EKONOMIS UNIT-UNIT PEMBANGKIT THERMAL MENGGUNAKAN METODE ALGORITMA GENETIKA*. Pontianak : Universitas Tanjungpura.

Anton Frian. 2016. *SECURITY CONSTRAINED UNIT COMMITMENT MEMPERTIMBANGKAN CADANGAN BERPUTAR DAN KAPASITAS SALURAN TRANSMISI MENGGUNAKAN ALGORITMA BINARY PARTICLE SWARM OPTIMIZATION*. Surabaya : ITS.

Azfar Muhammad. 2016. *INTEGRASI PERHITUNGAN RUGI-RUGI TRANSMISI PADA DYNAMIC ECONOMIC DISPATCH MENGGUNAKAN METODE LAGRANGE*. Surabaya : ITS.

Benjamin Wacker, Jan Chr.Schlüter.2021. *Pipeline for Annual Averaged Wind Power Output Generation Prediction of Wind Turbines Based on Large Wind Speed Data Sets and Power Curve Data*. Jerman: Universitas Sains Merseburg.

Bo Li, Yudong Wang, dkk. 2018. *A Fully Distributed Approach for Economic Dispatch Problem of Smart Grid*. China: *School of Automation Engineering*

Gonen, Turan. 1988. *ELECTRIC POWER TRANSMISSIONS SYSTEM ENGINEERING ANALYSIS AND DESIGN*. California: University OF W.A Library.

Hadi Saadat.2004. *Power System Analysis*. Singapura:McGraw Hill.

I Made Teguh Winasatria, I Made Mataram, dkk.2019. *Economic Dispatch Pada Pembangkit Listrik Tenaga Diesel Gas (PLTDG) Menggunakan Fuzzy Logic Controller (FLC)*. Bali: UNUD

Mismail, Budiono. 1997. *ANALISA SISTEM TENAGA*. Malang: Universitas Briwijaya.

Monib A, Waqas A, dkk. *Solving the Problem of Economic Load Dispatch for a Small Scale Power System Using a Novel Hybrid PSO-GSA Algorithm*. Pakistan: RCET

Mubarok, Abdul Goffar Al. 2018. *Rancang Bangun Sistem Pembangkit Listrik DC Tenaga Angin Berbasis Arduino*. Jakarta: Universitas Negeri Jakarta.

Nurhening Nuriyanti, Eko Prianto. 2008. *Pembangkit Tenaga Listrik*. Yogyakarta: UNY.

R Anand, V Balaji. 2015. *Power Flow Analysis of Simulink IEEE 57 Bus Test System Model using PSAT*. Chennai: Universitas St Peters.

Puneet Sharma, Jyotsna Mehra, dkk. 2014. *Line Flow Analysis Of IEEE Bus System With The Load Sensitivity Factor*. Greater Noida: Galgotias University.

Rizkyanto, Hardi. 2015. *DYNAMIC ECONOMIC DISPATCH (DED) DENGAN MEMPERHATIKAN RAMP-RATE MENGGUNAKAN METODE ITERASI LAMBDA BERBASIS DELPHI*. Surabaya: Institut Teknologi Sepuluh Nopember.

Suripto, Slamet. 2014. *Sistem Tenaga Listrik*. Yogyakarta: Universitas Muhammadiyah.

Wikarsa, Mohamed Tresna. 2010. *STUDI ANALISIS PROGRAM PERCEPATAN 10.000 MW TAHAP I PADA OPERASI SISTEM TENAGA LISTRIK JAWA BALI*. Jakarta: FT UI.

Yuni Rahmawati, Sujito. 2019. *Pembangkit Listrik Tenaga Surya*. Malang: The Learning University.

LAMPIRAN

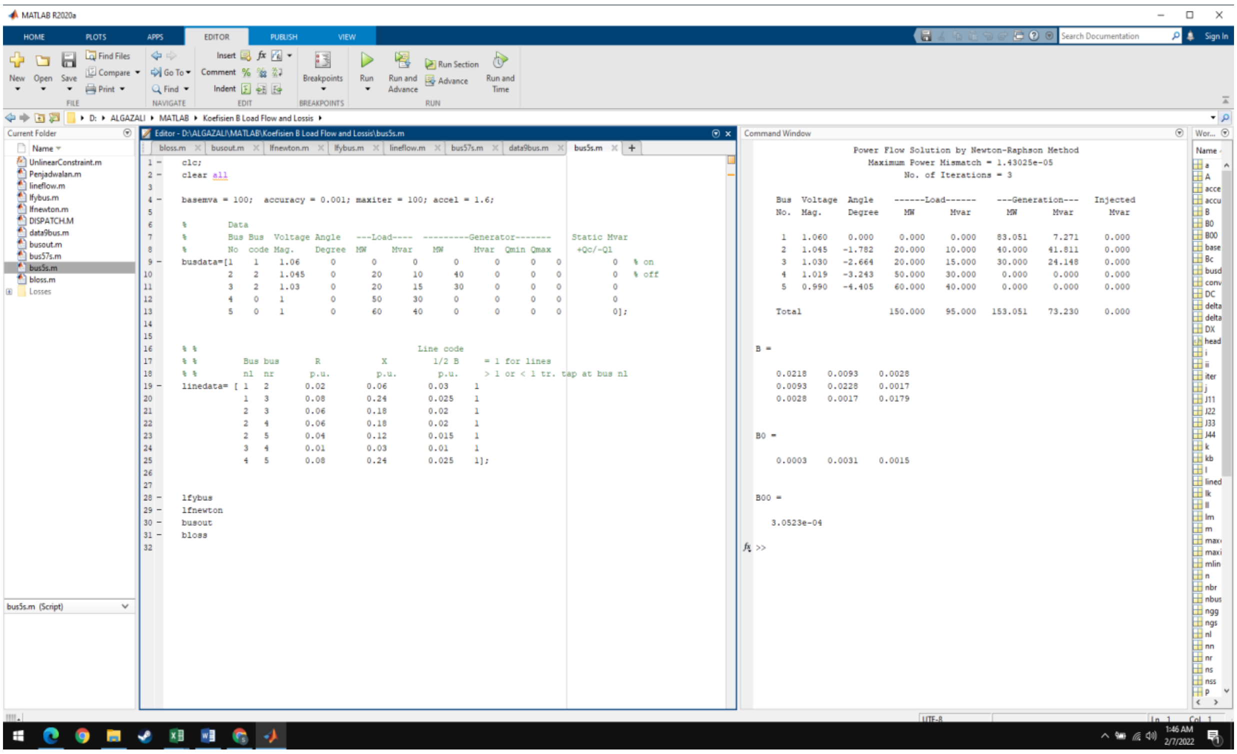
Simulasi Aliran Daya Newton Raphson

5 bus :

Code :

```
clc;
clear all

basemva = 100;  accuracy = 0.001; maxiter = 100; accel = 1.6;

%        Data
%        Bus Bus  Voltage Angle   ---Load----  ---------Generator-------    Static
Mvar
%        No  code Mag.    Degree  MW     Mvar    MW      Mvar  Qmin Qmax     +Qc/-
Ql
busdata=[1    1    1.06      0       0       0       0       0      0    0      0
% on
         2    2    1.045     0       20      10      40      0      0    0      0
% off
         3    2    1.03      0       20      15      30      0      0    0      0
         4    0    1         0       50      30      0       0      0    0      0
         5    0    1         0       60      40      0       0      0    0      0];


% %                                            Line code
% %         Bus bus       R            X        1/2 B     = 1 for lines
% %         nl  nr       p.u.         p.u.        p.u.     > 1 or < 1 tr. tap at
bus nl
linedata= [ 1   2       0.02        0.06        0.03     1
            1   3       0.08        0.24        0.025    1
            2   3       0.06        0.18        0.02     1
            2   4       0.06        0.18        0.02     1
            2   5       0.04        0.12        0.015    1
            3   4       0.01        0.03        0.01     1
            4   5       0.08        0.24        0.025    1];


lfybus
lfnewton
busout
bloss
```

Hasil :



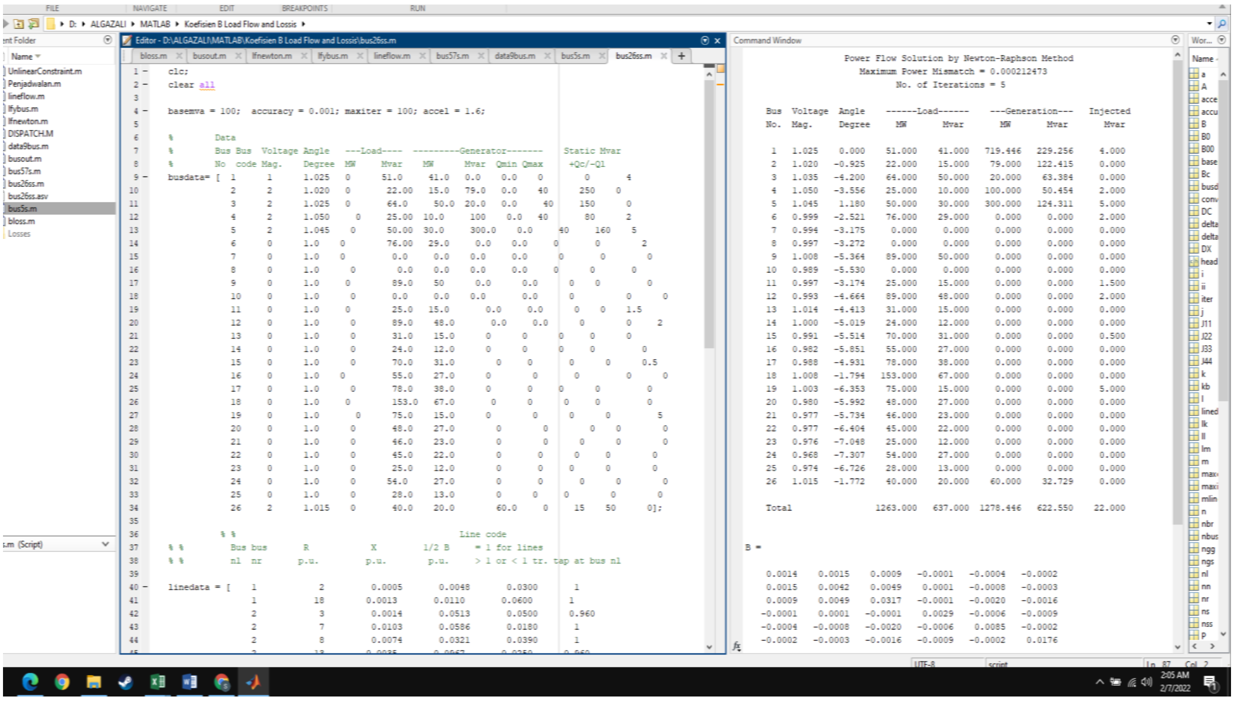
26 bus :

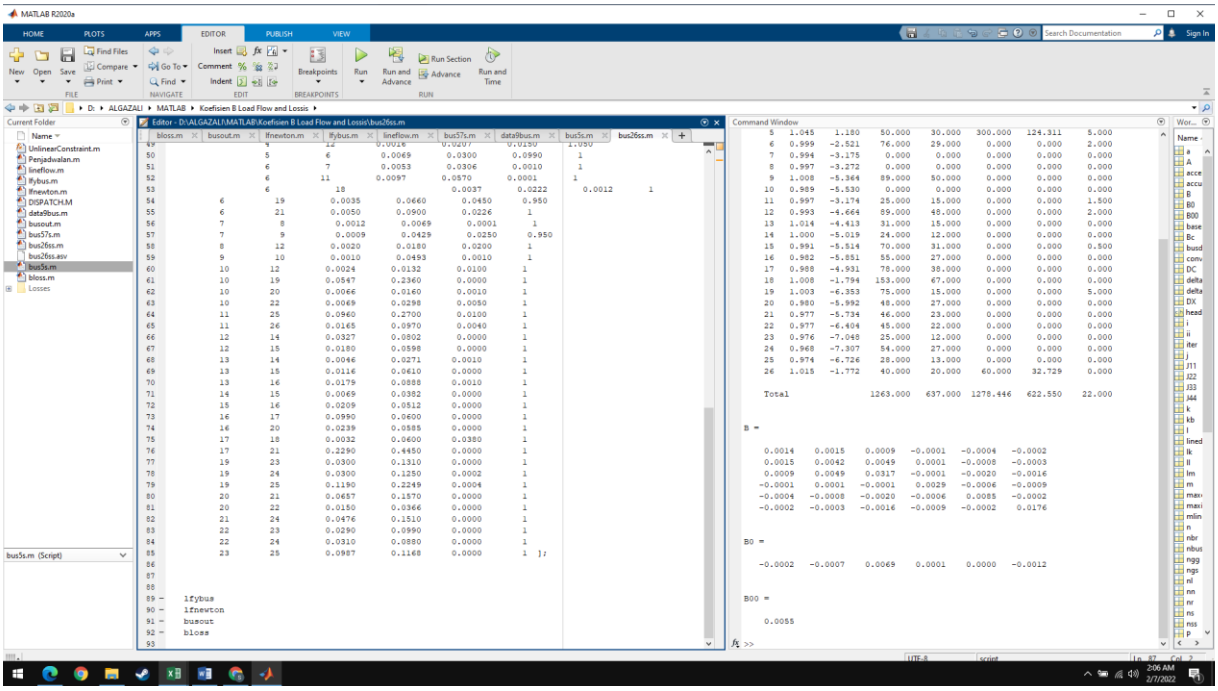
Code :

```
clc;
clear all

basemva = 100;  accuracy = 0.001; maxiter = 100; accel = 1.6;

%         Data
%         Bus Bus  Voltage Angle   ---Load----  ---------Generator-------    Static Mvar
%         No  code Mag.    Degree  MW       Mvar     MW      Mvar  Qmin Qmax     +Qc/-Ql
busdata= [  1      1      1.025    0       51.0      41.0    0.0    0.0     0          0         4
            2      2      1.020    0        22.00    15.0   79.0   0.0     40        250      0
            3      2      1.025    0        64.0      50.0  20.0   0.0      40       150         0
            4      2      1.050      0      25.00   10.0     100     0.0   40         80         2
            5      2      1.045    0        50.00   30.0    300.0    0.0      40      160      5
            6      0      1.0    0         76.00    29.0    0.0    0.0    0         0          2
            7      0      1.0    0          0.0     0.0    0.0    0.0     0         0          0
            8      0      1.0      0        0.0     0.0    0.0    0.0    0        0         0
            9      0      1.0     0        89.0     50      0.0      0.0      0     0          0
            10     0      1.0      0        0.0     0.0    0.0      0.0      0          0
0
            11     0      1.0     0        25.0    15.0       0.0      0.0      0      0     1.5
            12     0      1.0      0        89.0     48.0      0.0      0.0      0          0
2
            13     0      1.0      0        31.0     15.0     0       0       0      0          0
            14     0      1.0      0        24.0     12.0     0       0       0      0           0
            15     0      1.0      0        70.0     31.0        0       0      0       0      0.5
            16     0      1.0    0         55.0     27.0     0        0       0          0
0
            17     0      1.0      0        78.0     38.0     0       0      0       0           0
            18     0      1.0     0       153.0     67.0      0       0      0       0           0
            19     0      1.0        0      75.0     15.0     0        0      0       0
5
```

```
            20     0      1.0      0       48.0    27.0       0        0        0    0
0
            21     0      1.0      0       46.0    23.0       0        0      0      0
0
            22     0      1.0      0       45.0    22.0       0       0      0     0        0
            23     0      1.0      0       25.0    12.0       0       0     0      0        0
            24     0      1.0      0      54.0     27.0       0       0       0      0
0
            25     0      1.0      0       28.0    13.0       0      0     0        0
0
            26     2      1.015    0       40.0    20.0       60.0     0     15    50
0];

          % %                                         Line code
% %         Bus bus        R            X         1/2 B     = 1 for lines
% %         nl  nr       p.u.         p.u.        p.u.     > 1 or < 1 tr. tap at bus nl

linedata = [    1            2         0.0005       0.0048       0.0300       1
                1           18        0.0013       0.0110       0.0600       1
                2            3         0.0014       0.0513       0.0500      0.960
                2            7         0.0103       0.0586       0.0180       1
                2            8         0.0074       0.0321       0.0390       1
                2           13        0.0035       0.0967       0.0250      0.960
                2           26        0.0323       0.1967       0.0000       1
                3           13        0.0007       0.0054       0.0005      1.017
                4            8         0.0008       0.0240       0.0001      1.050
                4           12        0.0016       0.0207       0.0150      1.050
                5            6         0.0069       0.0300       0.0990       1
                6            7         0.0053       0.0306       0.0010       1
                6          11         0.0097       0.0570       0.0001       1
                6              18                   0.0037       0.0222       0.0012       1
       6          19         0.0035       0.0660       0.0450      0.950
       6          21         0.0050       0.0900       0.0226       1
       7           8          0.0012       0.0069       0.0001       1
       7           9          0.0009       0.0429       0.0250      0.950
       8          12         0.0020       0.0180       0.0200       1
       9          10         0.0010       0.0493       0.0010       1
       10        12         0.0024       0.0132       0.0100       1
       10        19         0.0547       0.2360       0.0000       1
       10        20         0.0066       0.0160       0.0010       1
       10        22         0.0069       0.0298       0.0050       1
       11        25         0.0960       0.2700       0.0100       1
       11        26         0.0165       0.0970       0.0040       1
       12        14         0.0327       0.0802       0.0000       1
       12        15         0.0180       0.0598       0.0000       1
       13        14         0.0046       0.0271      0.0010       1
       13        15         0.0116       0.0610      0.0000       1
       13        16         0.0179       0.0888      0.0010       1
       14        15         0.0069       0.0382      0.0000       1
       15        16         0.0209       0.0512      0.0000       1
       16        17         0.0990       0.0600      0.0000       1
       16        20         0.0239       0.0585      0.0000       1
       17        18         0.0032       0.0600      0.0380       1
       17        21         0.2290       0.4450      0.0000       1
       19        23         0.0300       0.1310      0.0000       1
       19        24         0.0300       0.1250      0.0002       1
       19        25         0.1190       0.2249      0.0004       1
       20        21         0.0657       0.1570      0.0000       1
       20        22         0.0150       0.0366      0.0000       1
       21        24         0.0476       0.1510      0.0000       1
       22        23         0.0290       0.0990      0.0000       1
       22        24         0.0310       0.0880      0.0000       1
       23        25         0.0987       0.1168      0.0000       1  ];


lfybus
lfnewton
busout
bloss
```

Hasil :


Power Flow Solution by Newton-Raphson Method
Maximum Power Mismatch = 0.000212473
No. of Iterations = 5


MATLAB R2020a

57 bus :

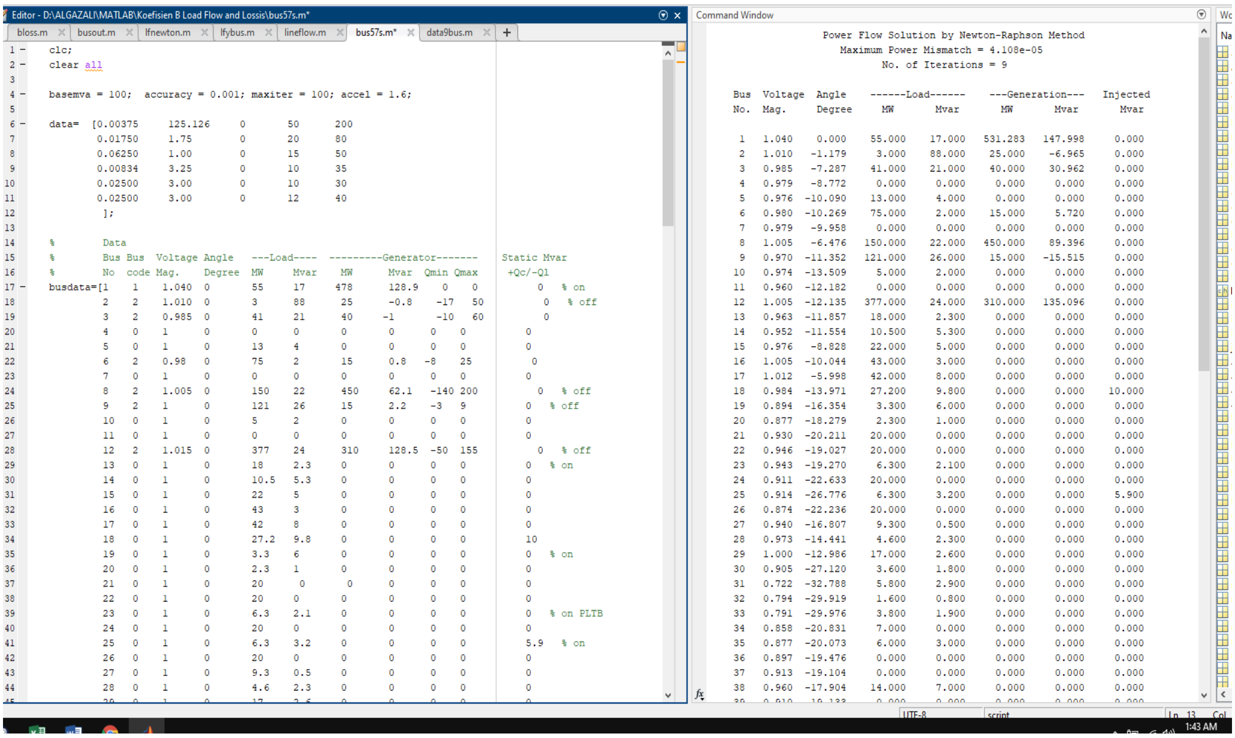
Code :

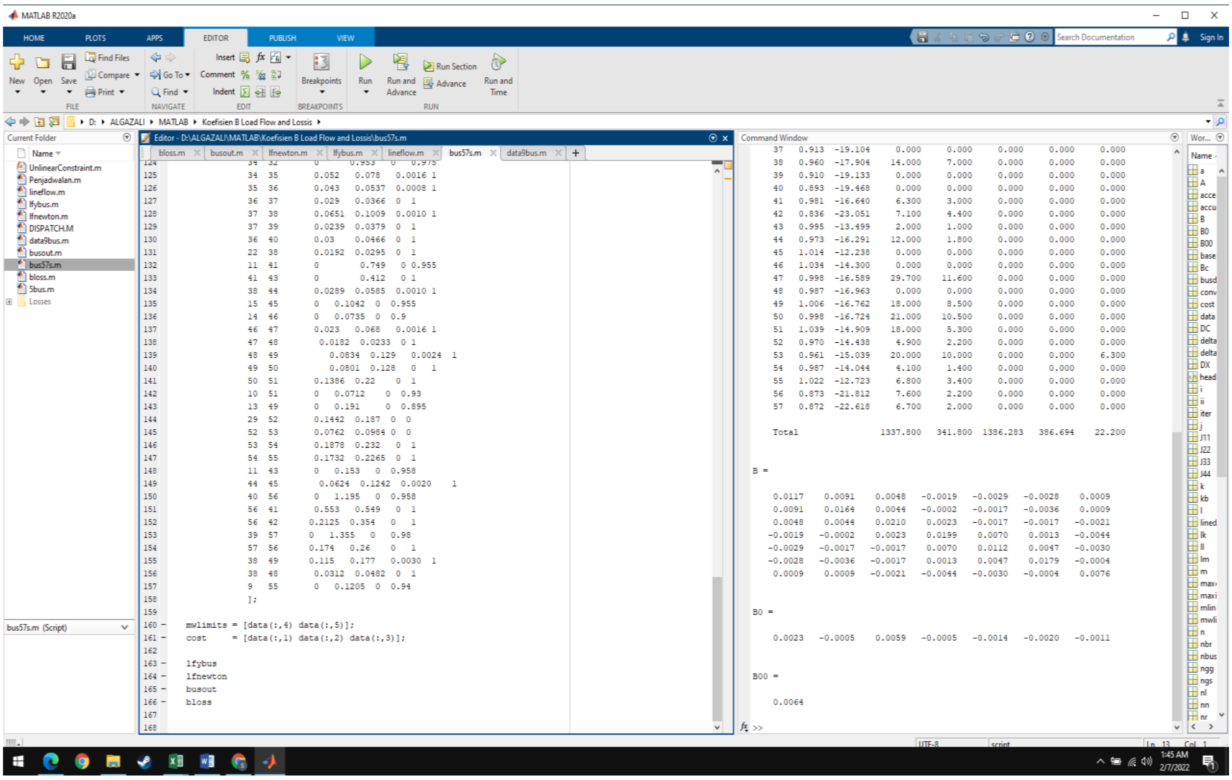
```
clc;
clear all

basemva = 100;  accuracy = 0.001; maxiter = 100; accel = 1.6;

data=  [0.00375     125.126     0       50      200
        0.01750     1.75        0       20      80
        0.06250     1.00        0       15      50
        0.00834     3.25        0       10      35
        0.02500     3.00        0       10      30
        0.02500     3.00        0       12      40
         ];

%        Data
%        Bus Bus  Voltage Angle   ---Load----  ---------Generator-------    Static Mvar
%        No  code Mag.    Degree  MW      Mvar    MW      Mvar  Qmin Qmax     +Qc/-Ql
busdata=[1    1    1.040  0       55      17     478      128.9    0    0          0   % on
         2    2    1.010  0       3       88      25      -0.8    -17   50          0   % off
         3    2    0.985  0       41      21      40     -1        -10   60          0
         4    0    1      0       0       0       0       0       0    0          0
         5    0    1      0       13      4       0       0       0    0          0
         6    2    0.98   0       75      2       15      0.8   -8     25          0
         7    0    1      0       0       0       0       0       0    0          0
         8    2    1.005  0       150     22      450     62.1   -140 200          0   % off
         9    2    1      0       121     26      15      2.2    -3    9          0   % off
         10   0    1      0       5       2       0       0       0    0          0
         11   0    1      0       0       0       0       0       0    0          0
         12   2    1.015  0       377     24      310     128.5  -50  155          0   % off
         13   0    1      0       18      2.3     0       0       0    0          0   % on
         14   0    1      0       10.5    5.3     0       0       0    0          0
         15   0    1      0       22      5       0       0       0    0          0
         16   0    1      0       43      3       0       0       0    0          0
         17   0    1      0       42      8       0       0       0    0          0
         18   0    1      0       27.2    9.8     0       0       0    0          10
         19   0    1      0       3.3     6       0       0       0    0          0   % on
         20   0    1      0       2.3     1       0       0       0    0          0
         21   0    1      0       20       0       0      0       0    0          0
         22   0    1      0       20      0       0       0       0    0          0
         23   0    1      0       6.3     2.1     0       0       0    0          0   % on PLTB
         24   0    1      0       20      0       0       0       0    0          0
         25   0    1      0       6.3     3.2     0       0       0    0          5.9   % on
         26   0    1      0       20      0       0       0       0    0          0
         27   0    1      0       9.3     0.5     0       0       0    0          0
         28   0    1      0       4.6     2.3     0       0       0    0          0
         29   0    1      0       17      2.6     0       0       0    0          0
         30   0    1      0       3.6     1.8     0       0       0    0          0
         31   0    1      0       5.8     2.9     0       0       0    0          0
         32   0    1      0       1.6     0.8     0       0       0    0          0
         33   0    1      0       3.8     1.9     0       0       0    0          0
         34   0    1      0       7       0       0       0       0    0          0
         35   0    1      0       6       3       0       0       0    0          0
         36   0    1      0       0       0       0       0       0    0          0
         37   0    1      0       0       0       0       0       0    0          0
         38   0    1      0       14      7       0       0       0    0          0
         39   0    1      0       0       0       0       0       0    0          0
         40   0    1      0       0       0       0       0       0    0          0
         41   0    1      0       6.3     3       0       0       0    0          0
         42   0    1      0       7.1     4.4     0       0       0    0          0
         43   0    1      0       2       1       0       0       0    0          0
         44   0    1      0       12      1.8     0       0       0    0          0
         45   0    1      0       0        0      0       0       0    0          0
         46   0    1      0       0        0      0       0       0    0          0
         47   0    1      0       29.7     11.6   0       0       0    0          0
         48   0    1      0       0        0      0       0       0    0          0
         49   0    1      0       18       8.5    0       0       0    0          0
         50   0    1      0       21       10.5   0       0       0    0          0
         51   0    1      0       18       5.3    0       0       0    0          0
         52   0    1      0       4.9      2.2    0       0       0    0          0
         53   0    1      0       20       10     0       0       0    0          6.3
         54   0    1      0       4.1      1.4    0       0       0    0          0
         55   0    1      0       6.8      3.4    0       0       0    0          0
         56   0    1      0       7.6      2.2    0       0       0    0          0
         57   0    1      0       6.7      2      0       0       0    0          0];

% %                                            Line code
```

```
% %          Bus bus       R            X         1/2 B     = 1 for lines
% %          nl  nr       p.u.         p.u.        p.u.     > 1 or < 1 tr. tap at bus nl
linedata= [ 1   2       0.0083     0.028     0.0645     1
            2   3       0.0298     0.085     0.0409     1
            3   4       0.0112     0.0366     0.0190     1
            4   5       0.0625     0.132     0.0129     1
            4   6       0.043      0.148     0.0174     1
            6   7       0.02       0.102     0.0138     1
            6   8       0.0339     0.173     0.0235     1
            8   9       0.0099     0.0505    0.0274     1
            9   10      0.0369     0.1679    0.0220     1
            9   11      0.0258     0.0848     0.0109     1
            9   12      0.0648     0.295     0.0386     1
            9   13      0.0481     0.295     0.0386     1
            13  14      0.0132     0.0434     0.0055     1
            13  15      0.0269     0.0869     0.0115     1
            1   15      0.0178     0.091     0.0494     1
            1   16      0.0454     0.206     0.0273     1
            1   17      0.0238     0.108     0.0143     1
            3   15      0.0162     0.053     0.0272     1
            4   18      0           0.555     0         0.97
            4   18      0           0.43     0          0.978
            5   6       0.0302     0.0641     0.0062     1
            7   8       0.0139     0.0712     0.0097     1
            10  12      0.0277     0.1262     0.0164     1
            11  13      0.0223     0.0732    0.0094     1
            12  13      0.0178     0.058     0.0302     1
            12  16      0.018     0.0813     0.0108     1
            12  17      0.0397     0.179     0.0238     1
            14  15      0.0171     0.0547     0.0074     1
            18  19      0.461     0.685        0          1
            19  20      0.283     0.434        0          1
            21  20      0          0.7767       0          1.043
            21  22      0.0736     0.117        0         1
            22  23      0.0099     0.0152       0         1
            23  24      0.166     0.256     0.0042     1
            24  25      0         1.182     0     1
            24  25      0         1.23      0     1
            24  26      0        0.0473     0   1.043
            26  27      0.165    0.254   0  1
            27  28      0.0618   0.0954  0  1
            28  29       0.0418  0.0587  0  1
            7   29       0      0.0648  0   0.967
            25  30      0.135   0.202   0   1
            30  31      0326    0.497   0   1
            31  32       0.507   0.755   0  1
            32  33       0.0392  0.036   0  1
            34  32       0      0.953   0   0.975
            34  35       0.052   0.078   0.0016 1
            35  36       0.043   0.0537  0.0008 1
            36  37       0.029   0.0366  0  1
            37  38       0.0651  0.1009  0.0010 1
            37  39       0.0239  0.0379  0  1
            36  40       0.03    0.0466  0  1
            22  38       0.0192  0.0295  0  1
            11  41       0        0.749   0 0.955
            41  43       0        0.412   0 1
            38  44       0.0289  0.0585  0.0010 1
            15  45       0   0.1042  0  0.955
            14  46       0   0.0735  0  0.9
            46  47       0.023   0.068   0.0016 1
            47  48        0.0182  0.0233  0 1
            48  49          0.0834  0.129   0.0024  1
            49  50          0.0801  0.128   0   1
            50  51       0.1386  0.22    0  1
            10  51       0   0.0712    0  0.93
            13  49       0   0.191     0  0.895
            29  52       0.1442  0.187  0  0
            52  53       0.0762  0.0984 0  0
            53  54       0.1878  0.232   0  1
            54  55       0.1732  0.2265  0  1
            11  43       0   0.153   0  0.958
            44  45        0.0624  0.1242  0.0020    1
            40  56       0   1.195   0  0.958
            56  41       0.553   0.549   0  1
            56  42      0.2125  0.354   0   1
            39  57      0   1.355   0   0.98
            57  56      0.174   0.26    0   1
            38  49      0.115   0.177   0.0030  1
            38  48       0.0312  0.0482  0  1
            9   55       0   0.1205  0  0.94
```

```
            ];

mwlimits = [data(:,4) data(:,5)];
cost     = [data(:,1) data(:,2) data(:,3)];

lfybus
lfnewton
busout
bloss
```

Hasil :




MATLAB R2020a
HOME
PLOTS
APPS
EDITOR
PUBLISH
VIEW
Search Documentation
Sign In
New
Open
Save
Find Files
Compare
Print
FILE
Go To
Find
NAVIGATE
Insert
Comment
Indent
EDIT
Breakpoints
BREAKPOINTS
Run
Run and Advance
Run Section
Advance
Run and Time
RUN
D: ▸ ALGAZALI ▸ MATLAB ▸ Koefisien B Load Flow and Lossis ▸
Current Folder
Name
UnlinearConstraint.m
Penjadwalan.m
lineflow.m
lfybus.m
lfnewton.m
DISPATCH.M
data9bus.m
busout.m
bus57s.m
bloss.m
5bus.m
Losses
bus57s.m (Script)
Editor - D:\ALGAZALI\MATLAB\Koefisien B Load Flow and Lossis\bus57s.m
bloss.m
busout.m
lfnewton.m
lfybus.m
lineflow.m
bus57s.m
data9bus.m
34 32 0 0.953 0 0.975
34 35 0.052 0.078 0.0016 1
35 36 0.043 0.0537 0.0008 1
36 37 0.029 0.0366 0 1
37 38 0.0651 0.1009 0.0010 1
37 39 0.0239 0.0379 0 1
36 40 0.03 0.0466 0 1
22 38 0.0192 0.0295 0 1
11 41 0 0.749 0 0.955
41 43 0 0.412 0 1
38 44 0.0289 0.0585 0.0010 1
15 45 0 0.1042 0 0.955
14 46 0 0.0735 0 0.9
46 47 0.023 0.068 0.0016 1
47 48 0.0182 0.0233 0 1
48 49 0.0834 0.129 0.0024 1
49 50 0.0801 0.128 0 1
50 51 0.1386 0.22 0 1
10 51 0 0.0712 0 0.93
13 49 0 0.191 0 0.895
29 52 0.1442 0.187 0 0
52 53 0.0762 0.0984 0 0
53 54 0.1878 0.232 0 1
54 55 0.1732 0.2265 0 1
11 43 0 0.153 0 0.958
44 45 0.0624 0.1242 0.0020 1
40 56 0 1.195 0 0.958
56 41 0.553 0.549 0 1
56 42 0.2125 0.354 0 1
39 57 0 1.355 0 0.98
57 56 0.174 0.26 0 1
38 49 0.115 0.177 0.0030 1
38 48 0.0312 0.0482 0 1
9 55 0 0.1205 0 0.94
];
mwlimits = [data(:,4) data(:,5)];
cost = [data(:,1) data(:,2) data(:,3)];
lfybus
lfnewton
busout
bloss
Command Window
37 0.913 -19.104 0.000 0.000 0.000 0.000 0.000
38 0.960 -17.904 14.000 7.000 0.000 0.000 0.000
39 0.910 -19.133 0.000 0.000 0.000 0.000 0.000
40 0.893 -19.468 0.000 0.000 0.000 0.000 0.000
41 0.981 -16.640 6.300 3.000 0.000 0.000 0.000
42 0.836 -23.051 7.100 4.400 0.000 0.000 0.000
43 0.995 -13.499 2.000 1.000 0.000 0.000 0.000
44 0.973 -16.291 12.000 1.800 0.000 0.000 0.000
45 1.014 -12.238 0.000 0.000 0.000 0.000 0.000
46 1.034 -14.300 0.000 0.000 0.000 0.000 0.000
47 0.998 -16.589 29.700 11.600 0.000 0.000 0.000
48 0.987 -16.963 0.000 0.000 0.000 0.000 0.000
49 1.006 -16.762 18.000 8.500 0.000 0.000 0.000
50 0.998 -16.724 21.000 10.500 0.000 0.000 0.000
51 1.039 -14.909 18.000 5.300 0.000 0.000 0.000
52 0.970 -14.438 4.900 2.200 0.000 0.000 0.000
53 0.961 -15.039 20.000 10.000 0.000 0.000 6.300
54 0.987 -14.044 4.100 1.400 0.000 0.000 0.000
55 1.022 -12.723 6.800 3.400 0.000 0.000 0.000
56 0.873 -21.812 7.600 2.200 0.000 0.000 0.000
57 0.872 -22.618 6.700 2.000 0.000 0.000 0.000
Total 1337.800 341.800 1386.283 386.694 22.200
B =
0.0117 0.0091 0.0048 -0.0019 -0.0029 -0.0028 0.0009
0.0091 0.0164 0.0044 -0.0002 -0.0017 -0.0036 0.0009
0.0048 0.0044 0.0210 0.0023 -0.0017 -0.0017 -0.0021
-0.0019 -0.0002 0.0023 0.0199 0.0070 0.0013 -0.0044
-0.0029 -0.0017 -0.0017 0.0070 0.0112 0.0047 -0.0030
-0.0028 -0.0036 -0.0017 0.0013 0.0047 0.0179 -0.0004
0.0009 0.0009 -0.0021 -0.0044 -0.0030 -0.0004 0.0076
B0 =
0.0023 -0.0005 0.0059 -0.0005 -0.0014 -0.0020 -0.0011
B00 =
0.0064
>>
UTF-8
script
Ln 13 Col 1
1:45 AM
2/7/2022

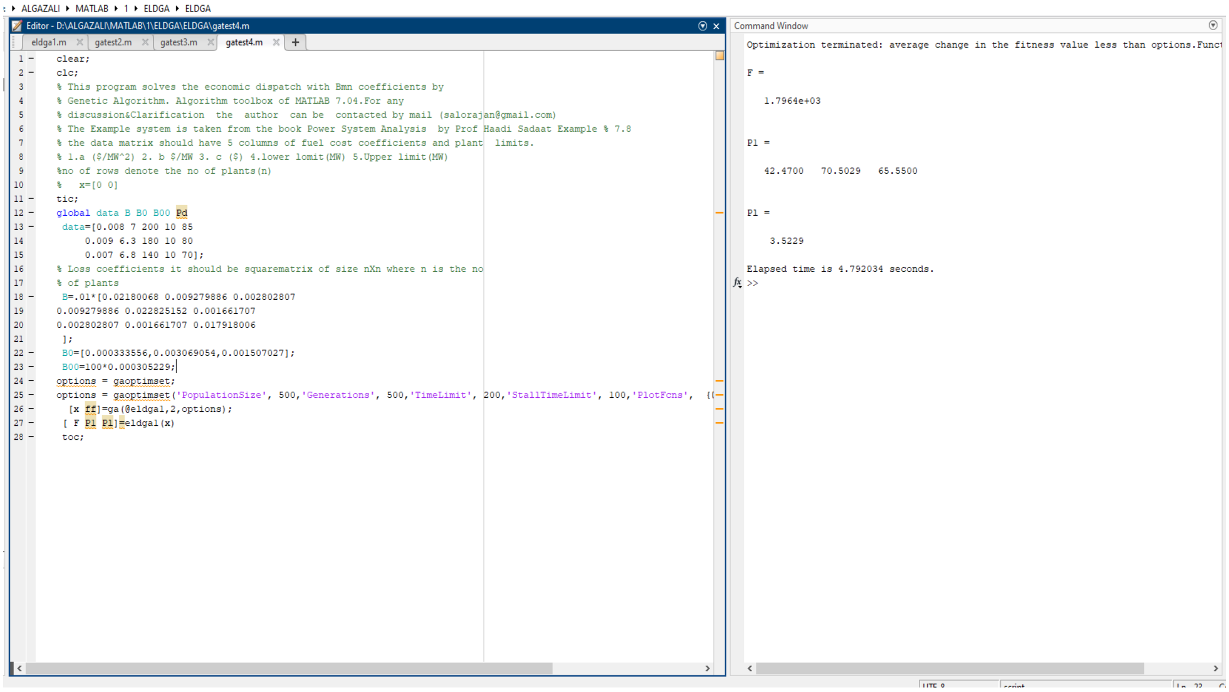
Hasil Simulasi *Economic Dispatch* Metode GA

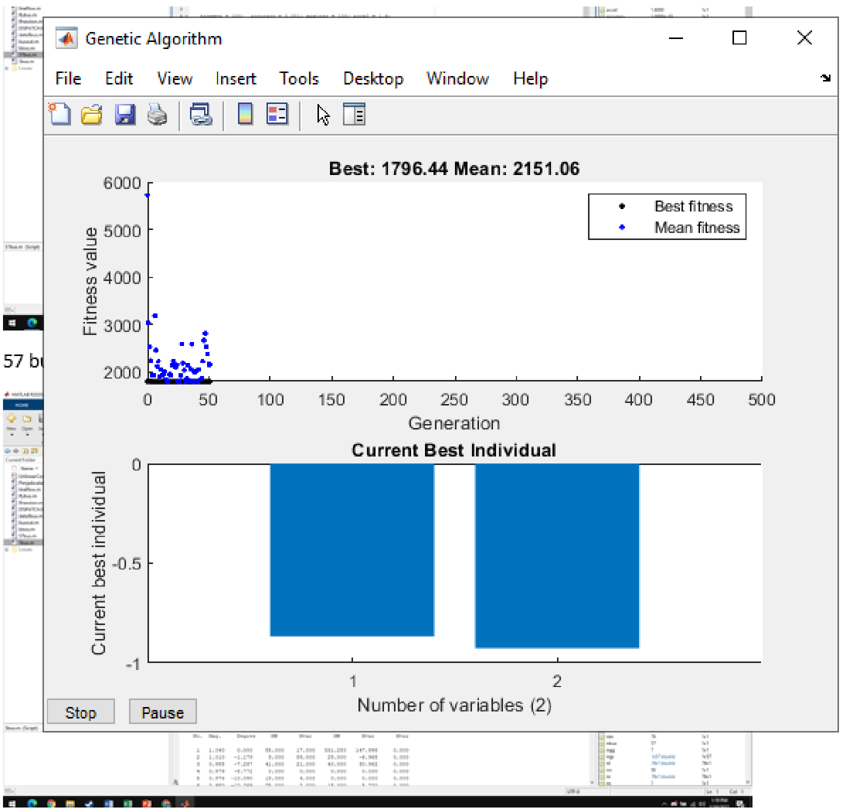
5 bus :

Code :

```
clear;
clc;
% This program solves the economic dispatch with Bmn coefficients
by
% Genetic Algorithm. Algorithm toolbox of MATLAB 7.04.For any
% discussion&Clarification  the  author  can be  contacted by mail
(salorajan@gmail.com)
% The Example system is taken from the book Power System Analysis
by Prof Haadi Sadaat Example % 7.8
% the data matrix should have 5 columns of fuel cost coefficients
and plant  limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper
limit(MW)
%no of rows denote the no of plants(n)
%   x=[0 0]
tic;
global data B B0 B00 Pd
 data=[0.008 7 200 10 85
     0.009 6.3 180 10 80
     0.007 6.8 140 10 70];
% Loss coefficients it should be squarematrix of size nXn where n
is the no
% of plants
 B=.01*[0.02180068 0.009279886 0.002802807
0.009279886 0.022825152 0.001661707
0.002802807 0.001661707 0.017918006
 ];
 B0=[0.000333556,0.003069054,0.001507027];
 B00=100*0.000305229;
options = gaoptimset;
options = gaoptimset('PopulationSize', 500,'Generations',
500,'TimeLimit', 200,'StallTimeLimit', 100,'PlotFcns',
{@gaplotbestf,@gaplotbestindiv});
  [x ff]=ga(@eldga1,2,options);
 [ F P1 Pl]=eldga1(x)
 toc;
```

Hasil :


ALGAZALI ▸ MATLAB ▸ 1 ▸ ELDGA ▸ ELDGA
Editor - D:\ALGAZALI\MATLAB\1\ELDGA\ELDGA\gatest4.m
eldga1.m
gatest2.m
gatest3.m
gatest4.m
clear;
clc;
% This program solves the economic dispatch with Bmn coefficients by
% Genetic Algorithm. Algorithm toolbox of MATLAB 7.04.For any
% discussion&Clarification the author can be contacted by mail (salorajan@gmail.com)
% The Example system is taken from the book Power System Analysis by Prof Haadi Sadaat Example % 7.8
% the data matrix should have 5 columns of fuel cost coefficients and plant limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper limit(MW)
%no of rows denote the no of plants(n)
% x=[0 0]
tic;
global data B B0 B00 Pd
data=[0.008 7 200 10 85
0.009 6.3 180 10 80
0.007 6.8 140 10 70];
% Loss coefficients it should be squarematrix of size nXn where n is the no
% of plants
B=.01*[0.02180068 0.009279886 0.002802807
0.009279886 0.022825152 0.001661707
0.002802807 0.001661707 0.017918006
];
B0=[0.000333556,0.003069054,0.001507027];
B00=100*0.000305229;
options = gaoptimset;
options = gaoptimset('PopulationSize', 500,'Generations', 500,'TimeLimit', 200,'StallTimeLimit', 100,'PlotFcns',
[x ff]=ga(@eldga1,2,options);
[F P1 P1]=eldga1(x)
toc;
Command Window
Optimization terminated: average change in the fitness value less than options.Funct
F =
1.7964e+03
P1 =
42.4700 70.5029 65.5500
P1 =
3.5229
Elapsed time is 4.792034 seconds.
>>

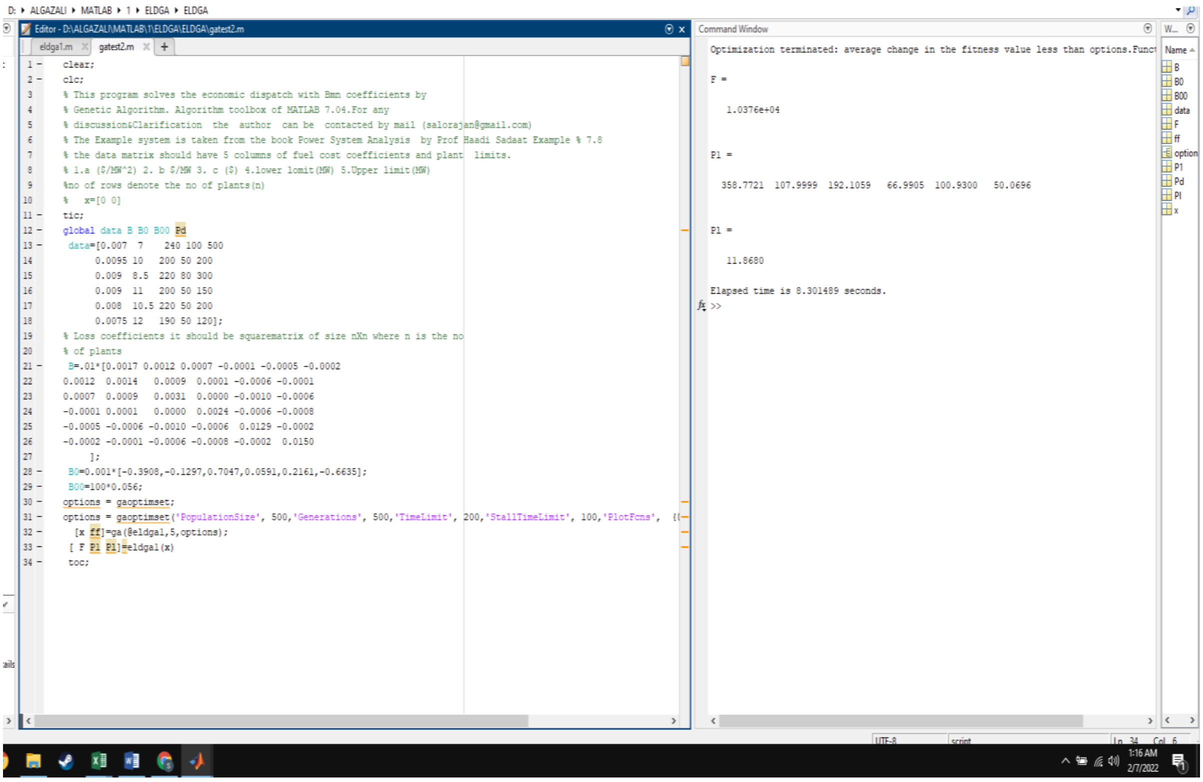

Genetic Algorithm
File Edit View Insert Tools Desktop Window Help
Best: 1796.44 Mean: 2151.06
Best fitness
Mean fitness
Fitness value
Generation
Current Best Individual
Current best individual
Number of variables (2)
Stop
Pause

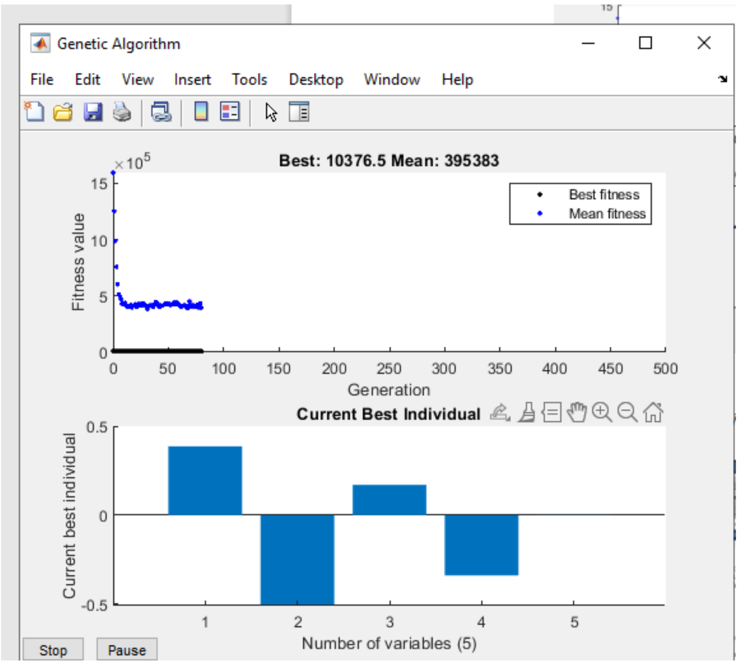
26 bus :

Code :

```
clear;
clc;
% This program solves the economic dispatch with Bmn coefficients
by
% Genetic Algorithm. Algorithm toolbox of MATLAB 7.04.For any
% discussion&Clarification  the  author  can be  contacted by mail
(salorajan@gmail.com)
% The Example system is taken from the book Power System Analysis
by Prof Haadi Sadaat Example % 7.8
% the data matrix should have 5 columns of fuel cost coefficients
and plant  limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper
limit(MW)
%no of rows denote the no of plants(n)
%   x=[0 0]
tic;
global data B B0 B00 Pd
 data=[0.007  7    240 100 500
      0.0095 10   200 50 200
      0.009  8.5  220 80 300
      0.009  11   200 50 150
      0.008  10.5 220 50 200
      0.0075 12   190 50 120];
% Loss coefficients it should be squarematrix of size nXn where n
is the no
% of plants
 B=.01*[0.0017 0.0012 0.0007 -0.0001 -0.0005 -0.0002
0.0012  0.0014   0.0009  0.0001 -0.0006 -0.0001
0.0007  0.0009   0.0031  0.0000 -0.0010 -0.0006
-0.0001 0.0001   0.0000  0.0024 -0.0006 -0.0008
-0.0005 -0.0006 -0.0010 -0.0006  0.0129 -0.0002
-0.0002 -0.0001 -0.0006 -0.0008 -0.0002  0.0150
     ];
 B0=0.001*[-0.3908,-0.1297,0.7047,0.0591,0.2161,-0.6635];
 B00=100*0.056;
options = gaoptimset;
options = gaoptimset('PopulationSize', 500,'Generations',
500,'TimeLimit', 200,'StallTimeLimit', 100,'PlotFcns',
{@gaplotbestf,@gaplotbestindiv});
  [x ff]=ga(@eldga1,5,options);
 [ F P1 Pl]=eldga1(x)
 toc;
```

Hasil :



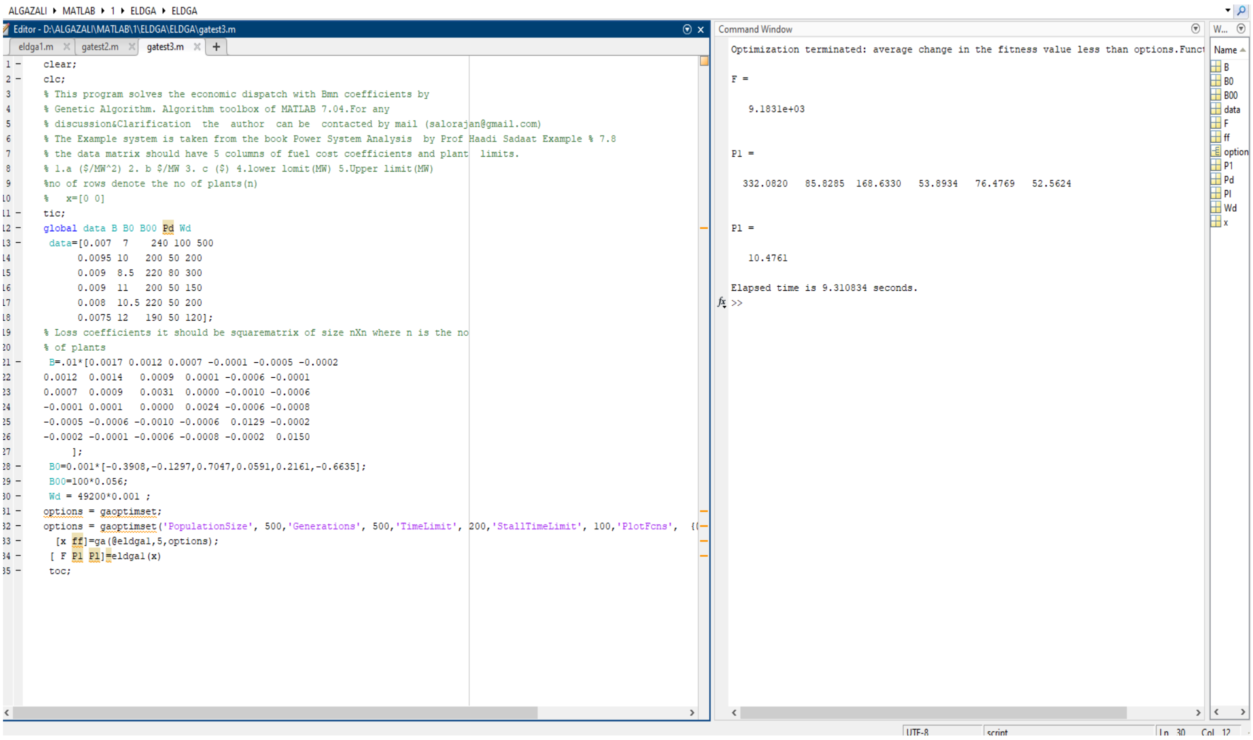

Genetic Algorithm
File Edit View Insert Tools Desktop Window Help
Best: 10376.5 Mean: 395383
Best fitness
Mean fitness
Fitness value
Generation
Current Best Individual
Current best individual
Number of variables (5)
Stop
Pause

26 Bus dengan PLTB :

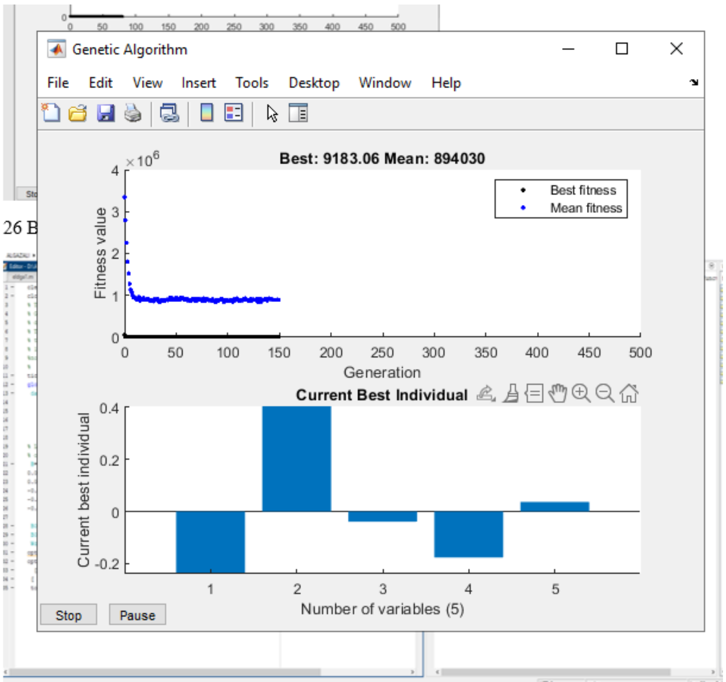
Code :

```
clear;
clc;
% This program solves the economic dispatch with Bmn coefficients by
% Genetic Algorithm. Algorithm toolbox of MATLAB 7.04.For any
% discussion&Clarification  the  author  can be  contacted by mail
(salorajan@gmail.com)
% The Example system is taken from the book Power System Analysis  by
Prof Haadi Sadaat Example % 7.8
% the data matrix should have 5 columns of fuel cost coefficients and
plant  limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper limit(MW)
%no of rows denote the no of plants(n)
%   x=[0 0]
tic;
global data B B0 B00 Pd Wd
 data=[0.007  7    240 100 500
      0.0095 10   200 50 200
      0.009  8.5  220 80 300
      0.009  11   200 50 150
      0.008  10.5 220 50 200
      0.0075 12   190 50 120];
% Loss coefficients it should be squarematrix of size nXn where n is the
no
% of plants
 B=.01*[0.0017 0.0012 0.0007 -0.0001 -0.0005 -0.0002
0.0012  0.0014   0.0009  0.0001 -0.0006 -0.0001
0.0007  0.0009   0.0031  0.0000 -0.0010 -0.0006
-0.0001 0.0001   0.0000  0.0024 -0.0006 -0.0008
-0.0005 -0.0006 -0.0010 -0.0006  0.0129 -0.0002
-0.0002 -0.0001 -0.0006 -0.0008 -0.0002  0.0150
     ];
 B0=0.001*[-0.3908,-0.1297,0.7047,0.0591,0.2161,-0.6635];
 B00=100*0.056;
 Wd = 49200*0.001 ;
options = gaoptimset;
options = gaoptimset('PopulationSize', 500,'Generations',
500,'TimeLimit', 200,'StallTimeLimit', 100,'PlotFcns',
{@gaplotbestf,@gaplotbestindiv});
  [x ff]=ga(@eldga1,5,options);
 [ F P1 Pl]=eldga1(x)
 toc;
```

Hasil :



ALGAZALI ▸ MATLAB ▸ 1 ▸ ELDGA ▸ ELDGA
Editor - D:\ALGAZALI\MATLAB\1\ELDGA\ELDGA\gatest3.m
eldga1.m
gatest2.m
gatest3.m
clear;
clc;
% This program solves the economic dispatch with Bmn coefficients by
% Genetic Algorithm. Algorithm toolbox of MATLAB 7.04.For any
% discussion&Clarification the author can be contacted by mail (salorajan@gmail.com)
% The Example system is taken from the book Power System Analysis by Prof Haadi Sadaat Example % 7.8
% the data matrix should have 5 columns of fuel cost coefficients and plant limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper limit(MW)
%no of rows denote the no of plants(n)
% x=[0 0]
tic;
global data B B0 B00 Pd Wd
data=[0.007 7 240 100 500
0.0095 10 200 50 200
0.009 8.5 220 80 300
0.009 11 200 50 150
0.008 10.5 220 50 200
0.0075 12 190 50 120];
% Loss coefficients it should be squarematrix of size nXn where n is the no
% of plants
B=.01*[0.0017 0.0012 0.0007 -0.0001 -0.0005 -0.0002
0.0012 0.0014 0.0009 0.0001 -0.0006 -0.0001
0.0007 0.0009 0.0031 0.0000 -0.0010 -0.0006
-0.0001 0.0001 0.0000 0.0024 -0.0006 -0.0008
-0.0005 -0.0006 -0.0010 -0.0006 0.0129 -0.0002
-0.0002 -0.0001 -0.0006 -0.0008 -0.0002 0.0150
];
B0=0.001*[-0.3908,-0.1297,0.7047,0.0591,0.2161,-0.6635];
B00=100*0.056;
Wd = 49200*0.001 ;
options = gaoptimset;
options = gaoptimset('PopulationSize', 500,'Generations', 500,'TimeLimit', 200,'StallTimeLimit', 100,'PlotFcns',
[x ff]=ga(@eldgal,5,options);
[F Pl Pl]=eldgal(x)
toc;
Command Window
Optimization terminated: average change in the fitness value less than options.Funct
F =
9.1831e+03
P1 =
332.0820 85.8285 168.6330 53.8934 76.4769 52.5624
Pl =
10.4761
Elapsed time is 9.310834 seconds.
fx >>
Name
B
B0
B00
data
F
ff
option
P1
Pd
Pl
Wd
x
UTF-8
script
Ln 30 Col 12



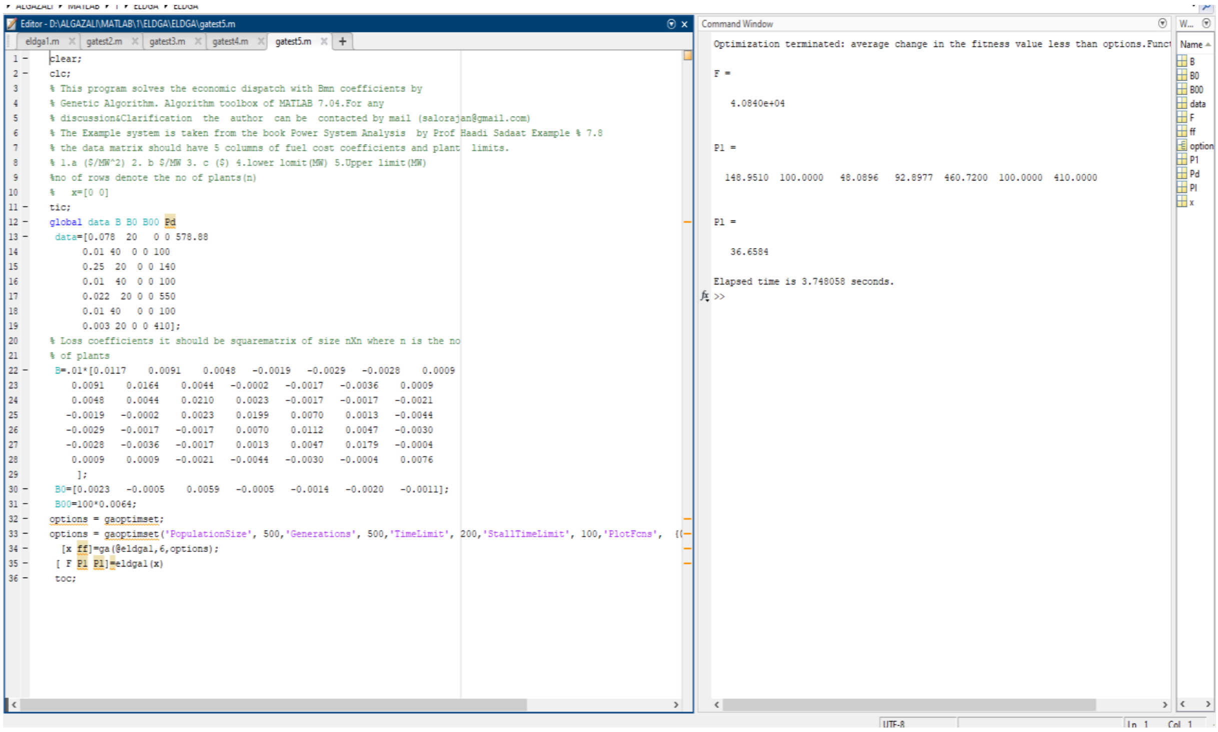
Genetic Algorithm
File Edit View Insert Tools Desktop Window Help
Best: 9183.06 Mean: 894030
×10^6
Best fitness
Mean fitness
Fitness value
Generation
0 50 100 150 200 250 300 350 400 450 500
Current Best Individual
Current best individual
Number of variables (5)
1 2 3 4 5
Stop
Pause

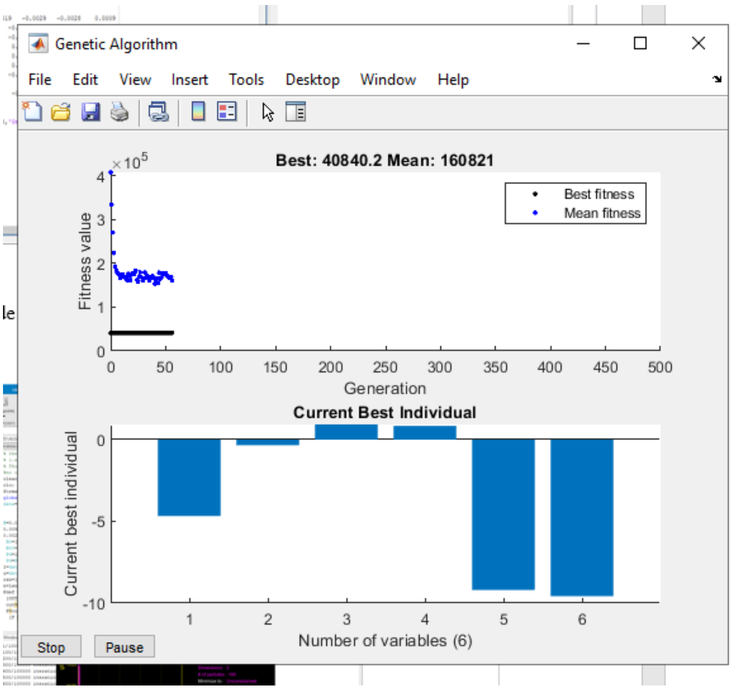
57 bus :

Code :

```
clear;
clc;
% This program solves the economic dispatch with Bmn coefficients by
% Genetic Algorithm. Algorithm toolbox of MATLAB 7.04.For any
% discussion&Clarification  the  author  can be  contacted by mail
(salorajan@gmail.com)
% The Example system is taken from the book Power System Analysis  by
Prof Haadi Sadaat Example % 7.8
% the data matrix should have 5 columns of fuel cost coefficients and
plant  limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper limit(MW)
%no of rows denote the no of plants(n)
%   x=[0 0]
tic;
global data B B0 B00 Pd
 data=[0.078  20   0 0 578.88
      0.01 40  0 0 100
      0.25  20  0 0 140
      0.01  40  0 0 100
      0.022  20 0 0 550
      0.01 40   0 0 100
      0.003 20 0 0 410];
% Loss coefficients it should be squarematrix of size nXn where n is the
no
% of plants
 B=.01*[0.0117    0.0091    0.0048   -0.0019   -0.0029   -0.0028
0.0009
    0.0091    0.0164    0.0044   -0.0002   -0.0017   -0.0036    0.0009
    0.0048    0.0044    0.0210    0.0023   -0.0017   -0.0017   -0.0021
   -0.0019   -0.0002    0.0023    0.0199    0.0070    0.0013   -0.0044
   -0.0029   -0.0017   -0.0017    0.0070    0.0112    0.0047   -0.0030
   -0.0028   -0.0036   -0.0017    0.0013    0.0047    0.0179   -0.0004
    0.0009    0.0009   -0.0021   -0.0044   -0.0030   -0.0004    0.0076
     ];
 B0=[0.0023   -0.0005    0.0059   -0.0005   -0.0014   -0.0020   -0.0011];
 B00=100*0.0064;
options = gaoptimset;
options = gaoptimset('PopulationSize', 500,'Generations',
500,'TimeLimit', 200,'StallTimeLimit', 100,'PlotFcns',
{@gaplotbestf,@gaplotbestindiv});
  [x ff]=ga(@eldga1,6,options);
 [ F P1 Pl]=eldga1(x)
 toc;
```

Hasil :

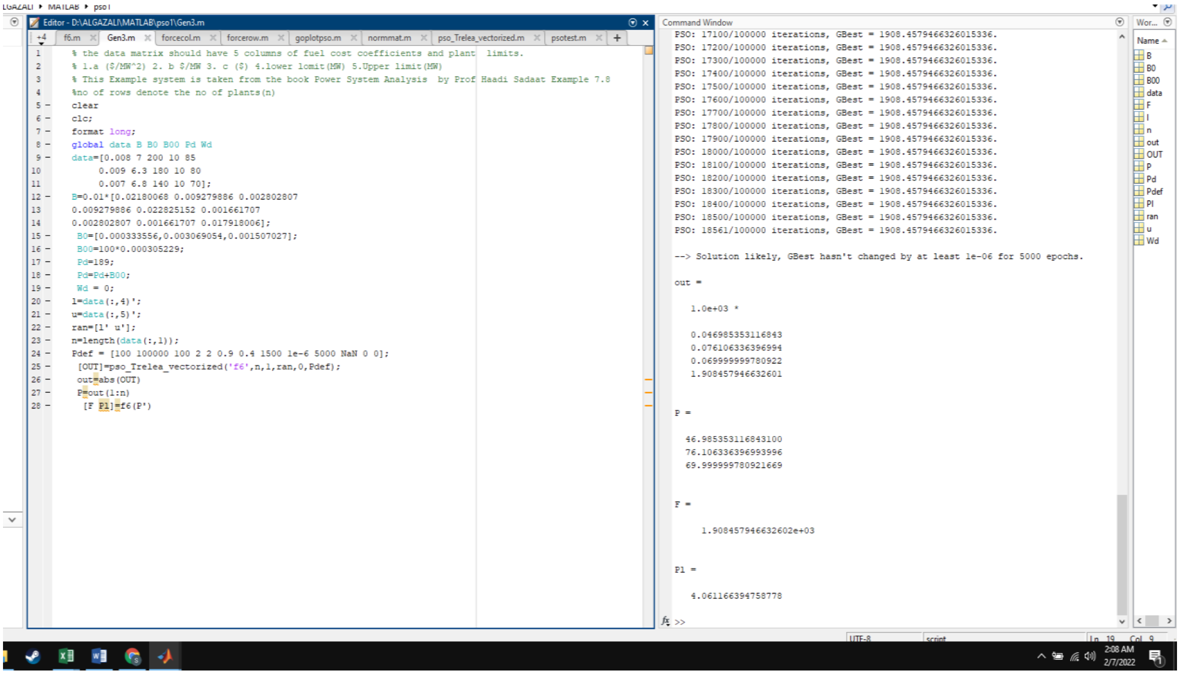

Editor - D:\ALGAZALI\MATLAB\1\ELDGA\ELDGA\gatest5.m
eldga1.m
gatest2.m
gatest3.m
gatest4.m
gatest5.m
clear;
clc;
% This program solves the economic dispatch with Bmn coefficients by
% Genetic Algorithm. Algorithm toolbox of MATLAB 7.04.For any
% discussion&Clarification the author can be contacted by mail (salorajan@gmail.com)
% The Example system is taken from the book Power System Analysis by Prof Haadi Sadaat Example % 7.8
% the data matrix should have 5 columns of fuel cost coefficients and plant limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper limit(MW)
%no of rows denote the no of plants(n)
% x=[0 0]
tic;
global data B B0 B00 Pd
data=[0.078 20 0 0 578.88
0.01 40 0 0 100
0.25 20 0 0 140
0.01 40 0 0 100
0.022 20 0 0 550
0.01 40 0 0 100
0.003 20 0 0 410];
% Loss coefficients it should be squarematrix of size nXn where n is the no
% of plants
B=.01*[0.0117 0.0091 0.0048 -0.0019 -0.0029 -0.0028 0.0009
0.0091 0.0164 0.0044 -0.0002 -0.0017 -0.0036 0.0009
0.0048 0.0044 0.0210 0.0023 -0.0017 -0.0017 -0.0021
-0.0019 -0.0002 0.0023 0.0199 0.0070 0.0013 -0.0044
-0.0029 -0.0017 -0.0017 0.0070 0.0112 0.0047 -0.0030
-0.0028 -0.0036 -0.0017 0.0013 0.0047 0.0179 -0.0004
0.0009 0.0009 -0.0021 -0.0044 -0.0030 -0.0004 0.0076
];
B0=[0.0023 -0.0005 0.0059 -0.0005 -0.0014 -0.0020 -0.0011];
B00=100*0.0064;
options = gaoptimset;
options = gaoptimset('PopulationSize', 500,'Generations', 500,'TimeLimit', 200,'StallTimeLimit', 100,'PlotFcns',
[x ff]=ga(@eldga1,6,options);
[F P1 Pl]=eldga1(x)
toc;
Command Window
Optimization terminated: average change in the fitness value less than options.Func
F =
4.0840e+04
P1 =
148.9510 100.0000 48.0896 92.8977 460.7200 100.0000 410.0000
Pl =
36.6584
Elapsed time is 3.748058 seconds.
Name
B
B0
B00
data
F
ff
options
P1
Pd
Pl
x


Genetic Algorithm
File Edit View Insert Tools Desktop Window Help
Best: 40840.2 Mean: 160821
× 10^5
Best fitness
Mean fitness
Fitness value
Generation
0 50 100 150 200 250 300 350 400 450 500
Current Best Individual
Current best individual
Number of variables (6)
1 2 3 4 5 6
Stop
Pause

Hasil Simulasi Metode PSO :

5 Bus :

```
% the data matrix should have 5 columns of fuel cost coefficients
and plant  limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper
limit(MW)
% This Example system is taken from the book Power System Analysis
by Prof Haadi Sadaat Example 7.8
%no of rows denote the no of plants(n)
clear
clc;
format long;
global data B B0 B00 Pd Wd
data=[0.008 7 200 10 85
     0.009 6.3 180 10 80
     0.007 6.8 140 10 70];
B=0.01*[0.02180068 0.009279886 0.002802807
0.009279886 0.022825152 0.001661707
0.002802807 0.001661707 0.017918006];
 B0=[0.000333556,0.003069054,0.001507027];
 B00=100*0.000305229;
 Pd=189;
 Pd=Pd+B00;
 Wd = 0;
l=data(:,4)';
u=data(:,5)';
ran=[l' u'];
n=length(data(:,1));
Pdef = [100 100000 100 2 2 0.9 0.4 1500 1e-6 5000 NaN 0 0];
 [OUT]=pso_Trelea_vectorized('f6',n,1,ran,0,Pdef);
 out=abs(OUT)
 P=out(1:n)
  [F Pl]=f6(P')
```


Editor - D:\ALGAZALI\MATLAB\pso1\Gen3.m
f6.m
Gen3.m
forcecol.m
forcerow.m
goplotpso.m
normmat.m
pso_Trelea_vectorized.m
psotest.m
% the data matrix should have 5 columns of fuel cost coefficients and plant limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper limit(MW)
% This Example system is taken from the book Power System Analysis by Prof Haadi Sadaat Example 7.8
%no of rows denote the no of plants(n)
clear
clc;
format long;
global data B B0 B00 Pd Wd
data=[0.008 7 200 10 85
0.009 6.3 180 10 80
0.007 6.8 140 10 70];
B=0.01*[0.02180068 0.009279886 0.002802807
0.009279886 0.022825152 0.001661707
0.002802807 0.001661707 0.017918006];
B0=[0.000333556,0.003069054,0.001507027];
B00=100*0.000305229;
Pd=189;
Pd=Pd+B00;
Wd = 0;
l=data(:,4)';
u=data(:,5)';
ran=[l' u'];
n=length(data(:,1));
Pdef = [100 100000 100 2 2 0.9 0.4 1500 1e-6 5000 NaN 0 0];
[OUT]=pso_Trelea_vectorized('f6',n,1,ran,0,Pdef);
out=abs(OUT)
P=out(1:n)
[F P1]=f6(P')
Command Window
PSO: 17100/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17200/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17300/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17400/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17500/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17600/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17700/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17800/100000 iterations, GBest = 1908.4579466326015336.
PSO: 17900/100000 iterations, GBest = 1908.4579466326015336.
PSO: 18000/100000 iterations, GBest = 1908.4579466326015336.
PSO: 18100/100000 iterations, GBest = 1908.4579466326015336.
PSO: 18200/100000 iterations, GBest = 1908.4579466326015336.
PSO: 18300/100000 iterations, GBest = 1908.4579466326015336.
PSO: 18400/100000 iterations, GBest = 1908.4579466326015336.
PSO: 18500/100000 iterations, GBest = 1908.4579466326015336.
PSO: 18561/100000 iterations, GBest = 1908.4579466326015336.
--> Solution likely, GBest hasn't changed by at least 1e-06 for 5000 epochs.
out =
1.0e+03 *
0.046985353116843
0.076106336396994
0.069999999780922
1.908457946632601
P =
46.985353116843100
76.106336396993996
69.999999780921669
F =
1.908457946632602e+03
P1 =
4.061166394758778
2:08 AM
2/7/2022

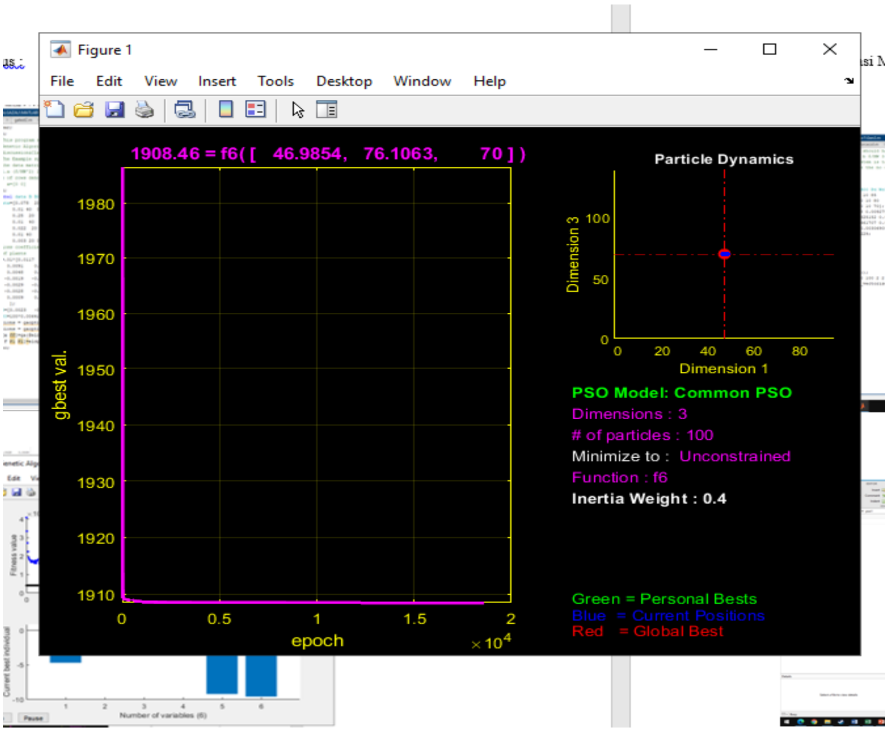


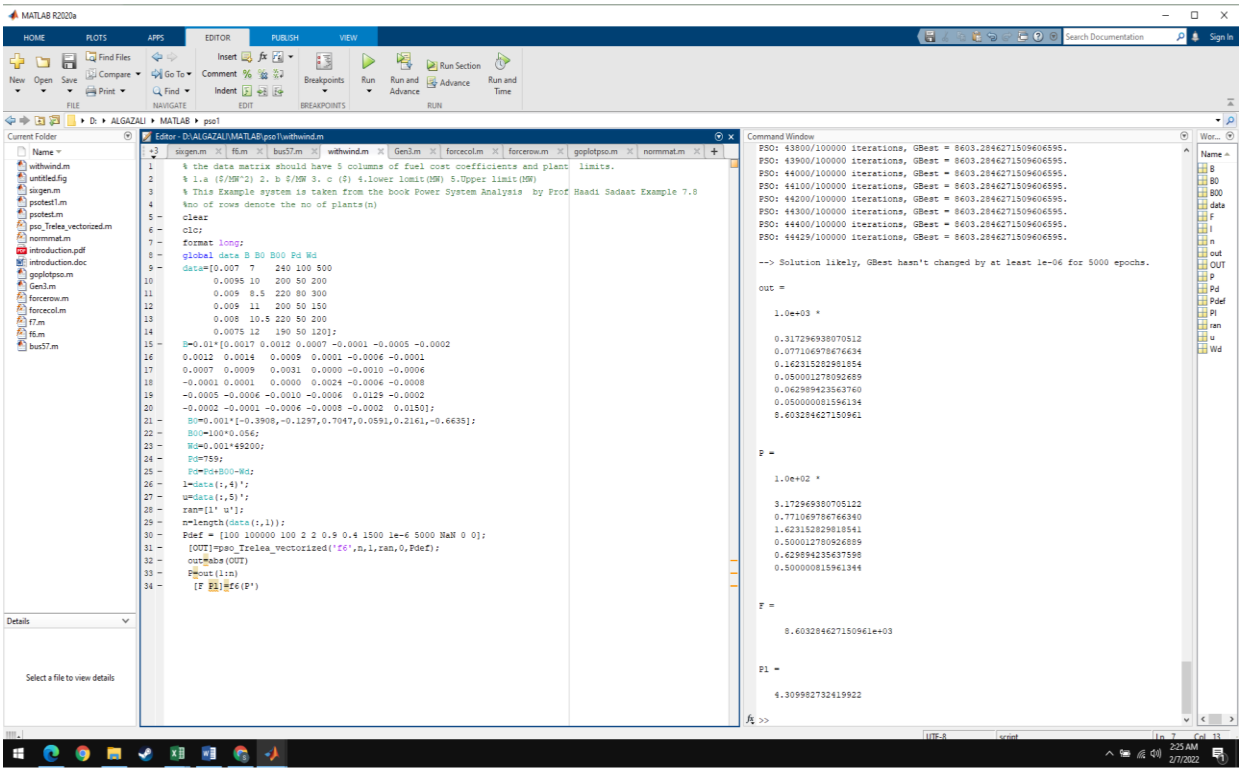
Figure 1
File
Edit
View
Insert
Tools
Desktop
Window
Help
1908.46 = f6([46.9854, 76.1063, 70])
gbest val.
epoch
Particle Dynamics
Dimension 3
Dimension 1
PSO Model: Common PSO
Dimensions : 3
# of particles : 100
Minimize to : Unconstrained
Function : f6
Inertia Weight : 0.4
Green = Personal Bests
Blue = Current Positions
Red = Global Best

26 Bus :

Code :

```
% the data matrix should have 5 columns of fuel cost coefficients
and plant  limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper
limit(MW)
% This Example system is taken from the book Power System Analysis
by Prof Haadi Sadaat Example 7.8
%no of rows denote the no of plants(n)
clear
clc;
format long;
global data B B0 B00 Pd
data=[0.007  7    240 100 500
      0.0095 10   200 50 200
      0.009  8.5  220 80 300
      0.009  11   200 50 150
      0.008  10.5 220 50 200
      0.0075 12   190 50 120];
B=0.01*[0.0017 0.0012 0.0007 -0.0001 -0.0005 -0.0002
0.0012  0.0014   0.0009  0.0001 -0.0006 -0.0001
0.0007  0.0009   0.0031  0.0000 -0.0010 -0.0006
-0.0001 0.0001   0.0000  0.0024 -0.0006 -0.0008
-0.0005 -0.0006 -0.0010 -0.0006  0.0129 -0.0002
-0.0002 -0.0001 -0.0006 -0.0008 -0.0002  0.0150];
 B0=0.001*[-0.3908,-0.1297,0.7047,0.0591,0.2161,-0.6635];
 B00=100*0.056;
 Pd=987;
 Pd=Pd+B00;
l=data(:,4)';
u=data(:,5)';
ran=[l' u'];
n=length(data(:,1));
Pdef = [100 100000 100 2 2 0.9 0.4 1500 1e-6 5000 NaN 0 0];
 [OUT]=pso_Trelea_vectorized('f6',n,1,ran,0,Pdef);
 out=abs(OUT)
 P=out(1:n)
  [F Pl]=f6(P')
```

Hasil :



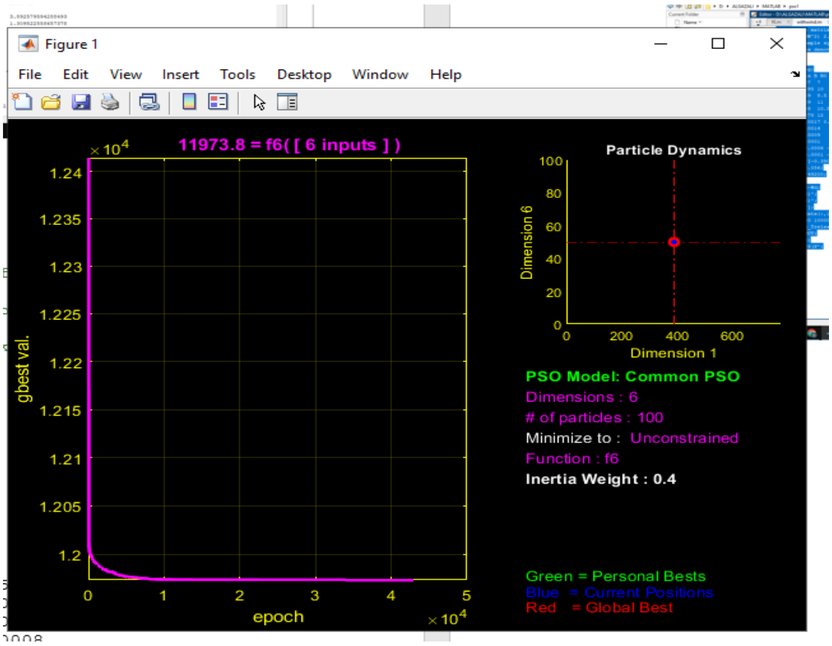


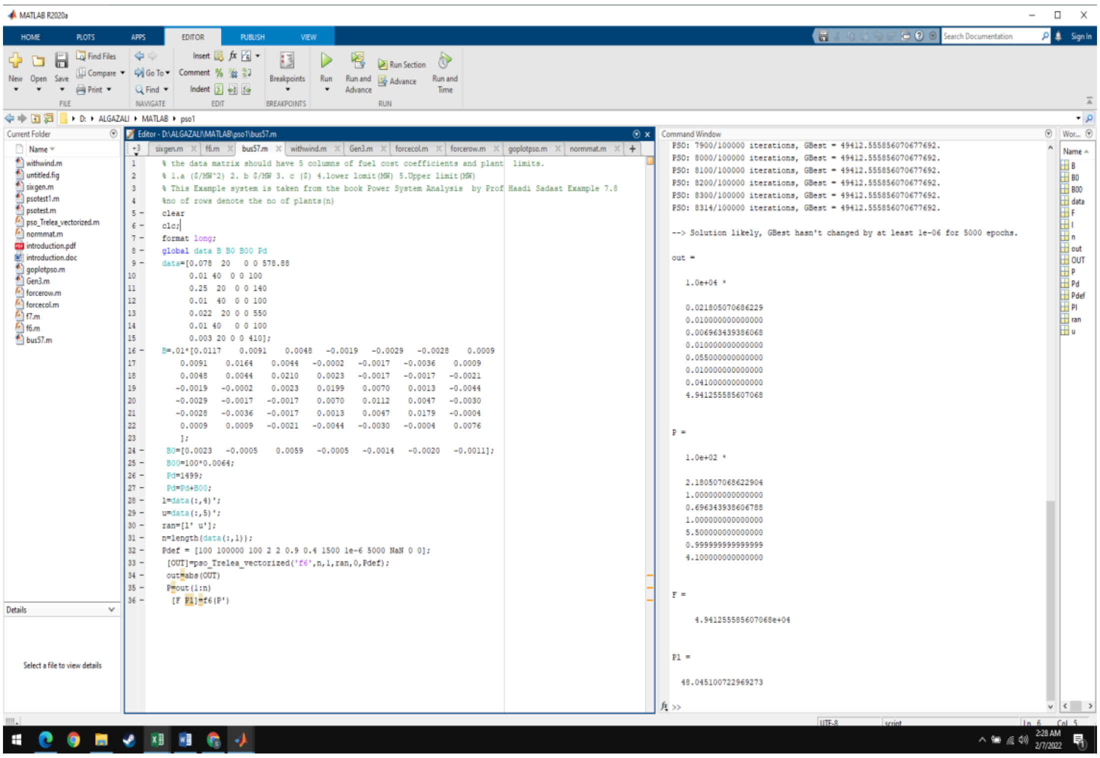
Figure 1
File Edit View Insert Tools Desktop Window Help
11973.8 = f6([6 inputs])
gbest val.
epoch
Particle Dynamics
Dimension 6
Dimension 1
PSO Model: Common PSO
Dimensions : 6
# of particles : 100
Minimize to : Unconstrained
Function : f6
Inertia Weight : 0.4
Green = Personal Bests
Blue = Current Positions
Red = Global Best

57 bus :

Code :

```
% the data matrix should have 5 columns of fuel cost coefficients
and plant  limits.
% 1.a ($/MW^2) 2. b $/MW 3. c ($) 4.lower lomit(MW) 5.Upper
limit(MW)
% This Example system is taken from the book Power System Analysis
by Prof Haadi Sadaat Example 7.8
%no of rows denote the no of plants(n)
clear
clc;
format long;
global data B B0 B00 Pd
data=[0.078  20   0 0 578.88
      0.01 40  0 0 100
      0.25  20  0 0 140
      0.01  40  0 0 100
      0.022  20 0 0 550
      0.01 40   0 0 100
      0.003 20 0 0 410];
B=.01*[0.0117    0.0091    0.0048   -0.0019   -0.0029   -0.0028
0.0009
    0.0091    0.0164    0.0044   -0.0002   -0.0017   -0.0036
0.0009
    0.0048    0.0044    0.0210    0.0023   -0.0017   -0.0017   -
0.0021
   -0.0019   -0.0002    0.0023    0.0199    0.0070    0.0013   -
0.0044
   -0.0029   -0.0017   -0.0017    0.0070    0.0112    0.0047   -
0.0030
   -0.0028   -0.0036   -0.0017    0.0013    0.0047    0.0179   -
0.0004
    0.0009    0.0009   -0.0021   -0.0044   -0.0030   -0.0004
0.0076
    ];
 B0=[0.0023   -0.0005    0.0059   -0.0005   -0.0014   -0.0020   -
0.0011];
 B00=100*0.0064;
 Pd=1499;
 Pd=Pd+B00;
l=data(:,4)';
u=data(:,5)';
ran=[l' u'];
n=length(data(:,1));
Pdef = [100 100000 100 2 2 0.9 0.4 1500 1e-6 5000 NaN 0 0];
 [OUT]=pso_Trelea_vectorized('f6',n,1,ran,0,Pdef);
 out=abs(OUT)
 P=out(1:n)
  [F Pl]=f6(P')
```

Hasil :



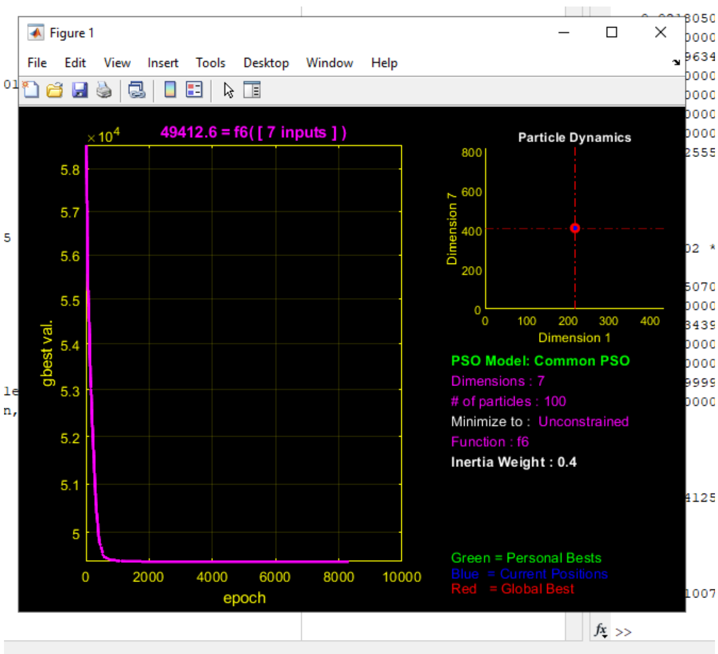


Figure 1
File Edit View Insert Tools Desktop Window Help
49412.6 = f6([7 inputs])
×10^4
gbest val.
epoch
Particle Dynamics
Dimension 7
Dimension 1
PSO Model: Common PSO
Dimensions : 7
# of particles : 100
Minimize to : Unconstrained
Function : f6
Inertia Weight : 0.4
Green = Personal Bests
Blue = Current Positions
Red = Global Best