

---

# MATLAB programming course for beginners, supported by Wagatsuma Lab@Kyutech

## Table of Contents

Specifications and requirements .....	1
Main program .....	1

/\* The MIT License (MIT): Copyright (c) 2021 Hiroaki Wagatsuma and Wagatsuma Lab@Kyutech

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE. \*/

## Specifications and requirements

1. @Time : 2021-1-16
2. @Author : Hiroaki Wagatsuma
3. @Site : [https://github.com/hirowgit/1B0\\_matla\\_optmization\\_course](https://github.com/hirowgit/1B0_matla_optmization_course)
4. @IDE : MATLAB R2018a
5. @File : A1\_ExcelRead\_and\_Plot\_Normal.m

## Main program

```
clear all;

clc

dataF='output';
fname='to_csv2.csv';
dname='Mdat';

Mdat=readtable(fullfile(dataF,fname));
lineD={};
```

```

Mdat.Properties
size(Mdat)
varnames=Mdat.Properties.VariableNames;
varnames
j=1;
Lsize=(size(Mdat,2)-1)/2;
for k=1:Lsize
    strLx=['x',num2str(k),'=',dname,','varnames{k*2}];
    strLy=['y',num2str(k),'=',dname,','varnames{k*2+1}];
    eval(strLx); eval(strLy);

    strLx=['lined{',num2str(k),' }(:,1)=',dname,','varnames{k*2}];
    strLy=['lined{',num2str(k),' }(:,2)=',dname,','varnames{k*2+1}];
    eval(strLx); eval(strLy);

end

for k=1:Lsize
    Dedge=find(lined{k}(:,1)>0 & lined{k}(:,1)>0);
    mD=max(Dedge);
    lined2{k}=[lined{k}(1:mD,1) lined{k}(1:mD,2)];
%     lined{k}(:,1)=find(lined{k}(:,1)
end

figure(1); clf
colM=colormap(lines(Lsize));
for k=1:Lsize
    pdata=lined2{k};
    plot(pdata(:,1),pdata(:,2),'color',colM(k,:), 'LineWidth',2),
    hold on;
end
myXlim=get(gca,'xlim'); myYlim=get(gca,'ylim');
set(gca,'xlim',myXlim+[-10 10],'ylim',myYlim+[-10 10]);
grid on; xlabel('x','FontSize',12); ylabel('y','FontSize',12)

ans =

    struct with fields:

        Description: ''
        UserData: []
    DimensionNames: {'Row' 'Variables'}
    VariableNames: {1x9 cell}
    VariableDescriptions: {}
    VariableUnits: {}
    VariableContinuity: []
    RowNames: {}

ans =

    202      9

```

```
varnames =  
  
    1×9 cell array  
  
    Columns 1 through 7  
  
    {'Var1'}    {'x1'}    {'y1'}    {'x2'}    {'y2'}    {'x3'}  
    {'y3'}  
  
    Columns 8 through 9  
  
    {'x4'}    {'y4'}  
  
x1 =  
  
    72.0000  
    72.0000  
    72.0000  
    73.0141  
    74.0282  
    75.0423  
    76.0563  
    77.0704  
    78.0845  
    79.0986  
    80.1127  
    81.1268  
    82.1408  
    83.1549  
    84.1690  
    85.1831  
    86.1972  
    87.2113  
    88.2254  
    89.2394  
    90.2535  
    91.2676  
    92.2817  
    93.2958  
    94.3099  
    95.3239  
    96.3380  
    97.3521  
    98.3662  
    99.3803  
   100.3944  
   101.4085  
   102.4225  
   103.4366  
   104.4507  
   105.4648
```

106.4789  
107.4930  
108.5070  
109.5211  
110.5352  
111.5493  
112.5634  
113.5775  
114.5915  
115.6056  
116.6197  
117.6338  
118.6479  
119.6620  
120.6761  
121.6901  
122.7042  
123.7183  
124.7324  
125.7465  
126.7606  
127.7746  
128.7887  
129.8028  
130.8169  
131.8310  
132.8451  
133.8592  
134.8732  
135.8873  
136.9014  
137.9155  
138.9296  
139.9437  
140.9577  
141.9718  
142.9859  
144.0000  
144.0000  
144.0727  
144.2853  
144.6296  
145.0974  
145.6804  
146.3704  
147.1591  
148.0384  
149.0000  
150.0357  
151.1372  
152.2963  
153.5048  
154.7545  
156.0370











62.0366  
63.0000  
63.0000  
64.0357  
65.1372  
66.2963  
67.5048  
68.7545  
70.0370  
71.3443  
72.6680  
74.0000  
75.3320  
76.6557  
77.9630  
79.2455  
80.4952  
81.7037  
82.8628  
83.9643  
85.0000  
85.9616  
86.8409  
87.6296  
88.3196  
88.9026  
89.3704  
89.7147  
89.9273  
90.0000  
90.0000  
91.0141  
92.0282  
93.0423  
94.0563  
95.0704  
96.0845  
97.0986  
98.1127  
99.1268  
100.1408  
101.1549  
102.1690  
103.1831  
104.1972  
105.2113  
106.2254  
107.2394  
108.2535  
109.2676  
110.2817  
111.2958  
112.3099  
113.3239

114.3380  
115.3521  
116.3662  
117.3803  
118.3944  
119.4085  
120.4225  
121.4366  
122.4507  
123.4648  
124.4789  
125.4930  
126.5070  
127.5211  
128.5352  
129.5493  
130.5634  
131.5775  
132.5915  
133.6056  
134.6197  
135.6338  
136.6479  
137.6620  
138.6761  
139.6901  
140.7042  
141.7183  
142.7324  
143.7465  
144.7606  
145.7746  
146.7887  
147.8028  
148.8169  
149.8310  
150.8451  
151.8592  
152.8732  
153.8873  
154.9014  
155.9155  
156.9296  
157.9437  
158.9577  
159.9718  
160.9859  
162.0000

`lineD =`

`1×1 cell array`

*{202×1 double}*

*lineD =*

*1×1 cell array*

*{202×2 double}*

*x2 =*

*72.0000  
72.0000  
72.0000  
73.0141  
74.0282  
75.0423  
76.0563  
77.0704  
78.0845  
79.0986  
80.1127  
81.1268  
82.1408  
83.1549  
84.1690  
85.1831  
86.1972  
87.2113  
88.2254  
89.2394  
90.2535  
91.2676  
92.2817  
93.2958  
94.3099  
95.3239  
96.3380  
97.3521  
98.3662  
99.3803  
100.3944  
101.4085  
102.4225  
103.4366  
104.4507  
105.4648  
106.4789  
107.4930  
108.5070  
109.5211  
110.5352  
111.5493*

112.5634  
113.5775  
114.5915  
115.6056  
116.6197  
117.6338  
118.6479  
119.6620  
120.6761  
121.6901  
122.7042  
123.7183  
124.7324  
125.7465  
126.7606  
127.7746  
128.7887  
129.8028  
130.8169  
131.8310  
132.8451  
133.8592  
134.8732  
135.8873  
136.9014  
137.9155  
138.9296  
139.9437  
140.9577  
141.9718  
142.9859  
144.0000  
144.0000  
144.0916  
144.3590  
144.7914  
145.3776  
146.1067  
146.9676  
147.9495  
149.0413  
150.2320  
151.5107  
152.8663  
154.2878  
155.7643  
157.2848  
158.8382  
160.4136  
162.0000  
162.0000  
163.1243  
164.2448  
165.3574













*O O*

```
lineD =  
    1x2 cell array  
    {202x2 double}    {202x1 double}  
  
lineD =  
    1x2 cell array
```

*{202×2 double}*      *{202×2 double}*

x3 =

180.0000  
180.0000  
180.0000  
179.9722  
179.8900  
179.7553  
179.5698  
179.3354  
179.0538  
178.7269  
178.3566  
177.9445  
177.4925  
177.0025  
176.4763  
175.9155  
175.3222  
174.6981  
174.0449  
173.3646  
172.6589  
171.9296  
171.1785  
170.4076  
169.6185  
168.8131  
167.9932  
167.1606  
166.3171  
165.4645  
164.6047  
163.7395  
162.8707  
162.0000  
162.0000  
160.5803  
159.1684  
157.7723  
156.3998  
155.0588  
153.7571  
152.5027  
151.3034  
150.1671  
149.1016  
148.1149  
147.2148  
146.4091

145.7058  
145.1127  
144.6377  
144.2887  
144.0735  
144.0000  
144.0000  
142.9859  
141.9718  
140.9577  
139.9437  
138.9296  
137.9155  
136.9014  
135.8873  
134.8732  
133.8592  
132.8451  
131.8310  
130.8169  
129.8028  
128.7887  
127.7746  
126.7606  
125.7465  
124.7324  
123.7183  
122.7042  
121.6901  
120.6761  
119.6620  
118.6479  
117.6338  
116.6197  
115.6056  
114.5915  
113.5775  
112.5634  
111.5493  
110.5352  
109.5211  
108.5070  
107.4930  
106.4789  
105.4648  
104.4507  
103.4366  
102.4225  
101.4085  
100.3944  
99.3803  
98.3662  
97.3521  
96.3380





124.2581  
123.3871  
122.5161  
121.6452  
120.7742  
119.9032  
119.0323  
118.1613  
117.2903  
116.4194  
115.5484  
114.6774  
113.8065  
112.9355  
112.0645  
111.1935  
110.3226  
109.4516  
108.5806  
107.7097  
106.8387  
105.9677  
105.0968  
104.2258  
103.3548  
102.4839  
101.6129  
100.7419  
99.8710  
99.0000  
99.0000  
97.6524  
96.4466  
95.3745  
94.4285  
93.6005  
92.8828  
92.2674  
91.7465  
91.3121  
90.9566  
90.6718  
90.4501  
90.2834  
90.1640  
90.0840  
90.0354  
90.0105  
90.0013  
90.0000  
90.0000  
90.0000  
90.0000  
90.0000







*O O*

$$lineD =$$

1x3 cell array

$$\{202 \times 2 \text{ double}\} \quad \{202 \times 2 \text{ double}\} \quad \{202 \times 1 \text{ double}\}$$
$$lineD =$$

1x3 cell array

$$\{202 \times 2 \text{ double}\} \quad \{202 \times 2 \text{ double}\} \quad \{202 \times 2 \text{ double}\}$$
$$x_4 =$$

72.0000  
72.0000  
72.0000  
73.0141  
74.0282  
75.0423  
76.0563  
77.0704  
78.0845  
79.0986  
80.1127  
81.1268  
82.1408  
83.1549  
84.1690  
85.1831  
86.1972  
87.2113  
88.2254  
89.2394  
90.2535  
91.2676  
92.2817  
93.2958  
94.3099  
95.3239  
96.3380  
97.3521  
98.3662  
99.3803  
100.3944  
101.4085  
102.4225  
103.4366  
104.4507  
105.4648  
106.4789  
107.4930  
108.5070  
109.5211  
110.5352  
111.5493  
112.5634  
113.5775  
114.5915  
115.6056  
116.6197  
117.6338  
118.6479  
119.6620  
120.6761  
121.6901  
122.7042  
123.7183

124.7324  
125.7465  
126.7606  
127.7746  
128.7887  
129.8028  
130.8169  
131.8310  
132.8451  
133.8592  
134.8732  
135.8873  
136.9014  
137.9155  
138.9296  
139.9437  
140.9577  
141.9718  
142.9859  
144.0000  
144.0000  
144.0735  
144.2887  
144.6377  
145.1127  
145.7058  
146.4091  
147.2148  
148.1149  
149.1016  
150.1671  
151.3034  
152.5027  
153.7571  
155.0588  
156.3998  
157.7723  
159.1684  
160.5803  
162.0000  
162.0000  
162.8707  
163.7395  
164.6047  
165.4645  
166.3171  
167.1606  
167.9932  
168.8131  
169.6185  
170.4076  
171.1785  
171.9296  
172.6589





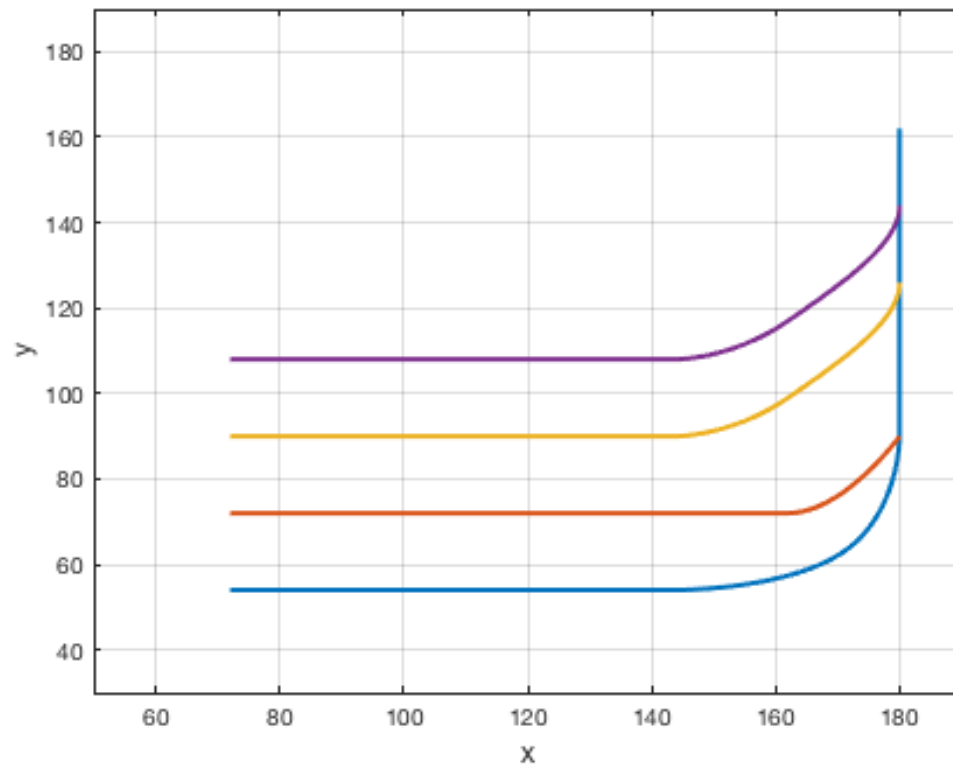


108.0000  
108.0000  
108.0000  
108.0000  
108.0000  
108.0000  
108.0000  
108.0000  
108.0000  
108.0000  
108.0000  
108.0013  
108.0105  
108.0354  
108.0840  
108.1640  
108.2834  
108.4501  
108.6718  
108.9566  
109.3121  
109.7465  
110.2674  
110.8828  
111.6005  
112.4285  
113.3745  
114.4466  
115.6524  
117.0000  
117.0000  
117.8710  
118.7419  
119.6129  
120.4839  
121.3548  
122.2258  
123.0968  
123.9677  
124.8387  
125.7097  
126.5806  
127.4516  
128.3226  
129.1935  
130.0645  
130.9355  
131.8065  
132.6774  
133.5484  
134.4194  
135.2903  
136.1613  
137.0323





$$lineD =$$
$$lineD =$$



*Published with MATLAB® R2018a*