

Project 3
Transonic Small Disturbance
code: `tsd.exe`
How to plot C_p contour

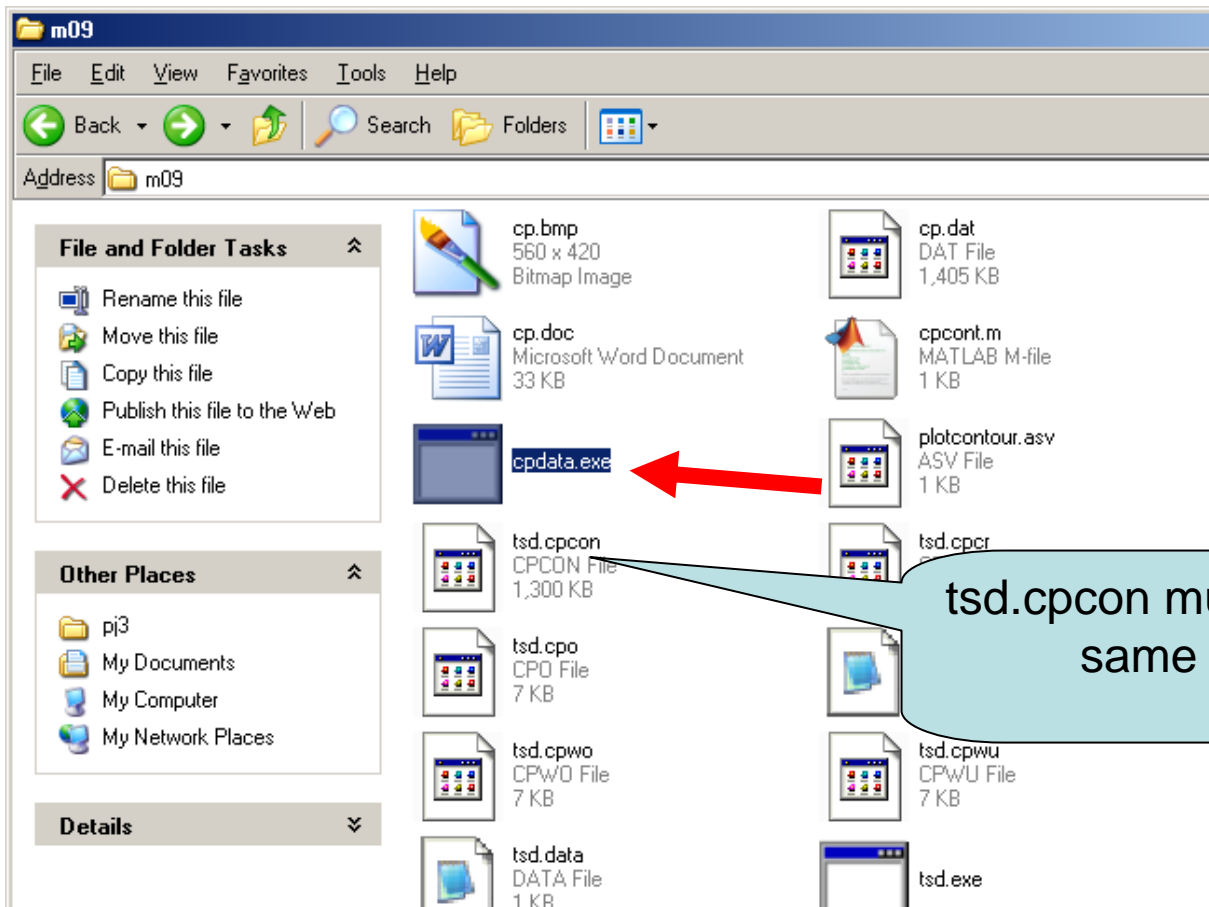
EAE127

execute cpdata.exe

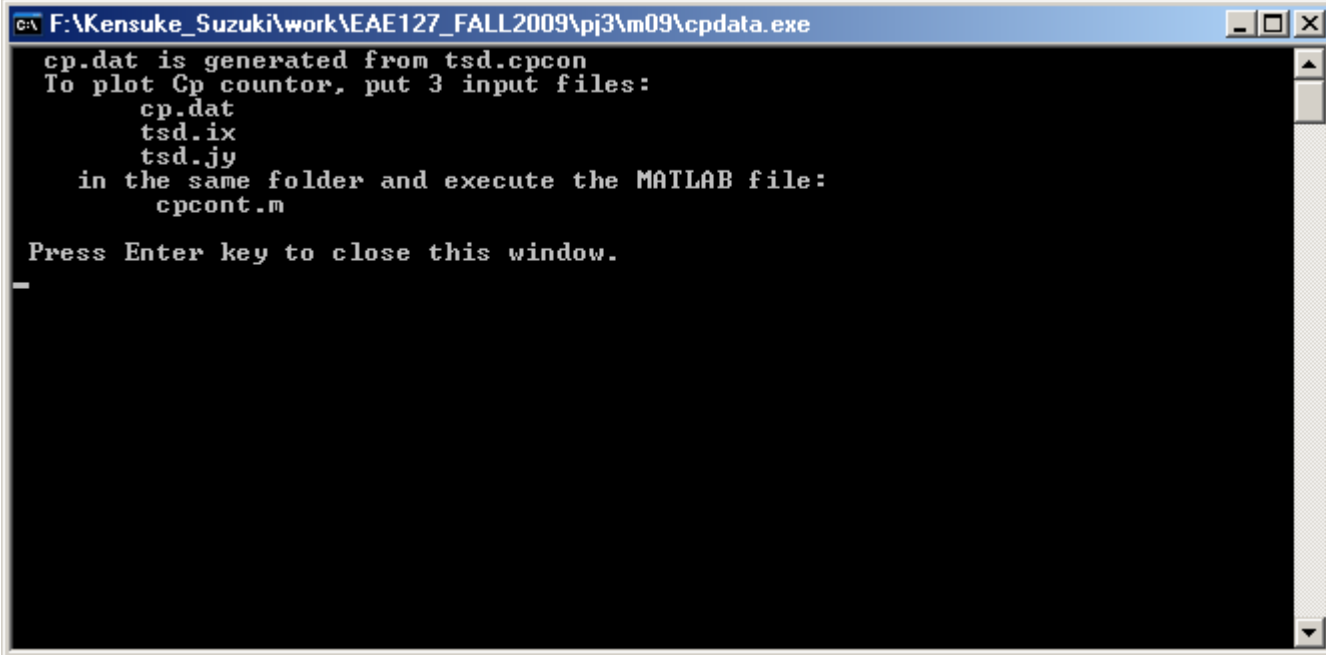
Input file: tsd.cpccon (output file of tsd.exe) must be in the same folder

Output file: cp.dat

Double click and execute cpdata.exe download from web



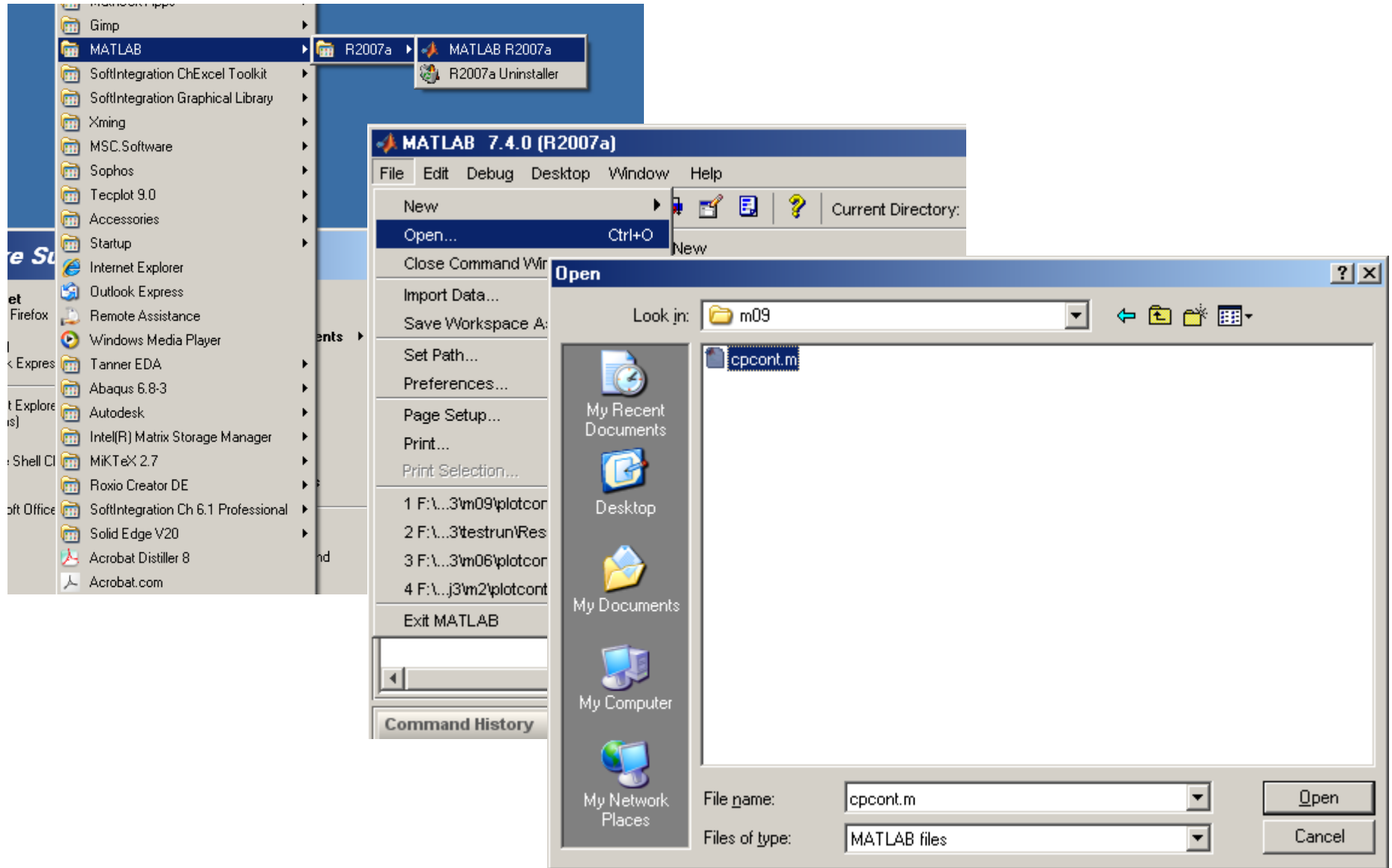
cp.dat is output



```
c:\ F:\Kensuke_Suzuki\work\EAE127_FALL2009\pj3\m09\cpdata.exe
cp.dat is generated from tsd.cpcon
To plot Cp counter, put 3 input files:
    cp.dat
    tsd.ix
    tsd.jy
in the same folder and execute the MATLAB file:
    cpcont.m

Press Enter key to close this window.
```

Open Matlab and open file, cpcont.m



Change caption, title, etc. Then run to plot

The screenshot shows a MATLAB script editor window with the following code:

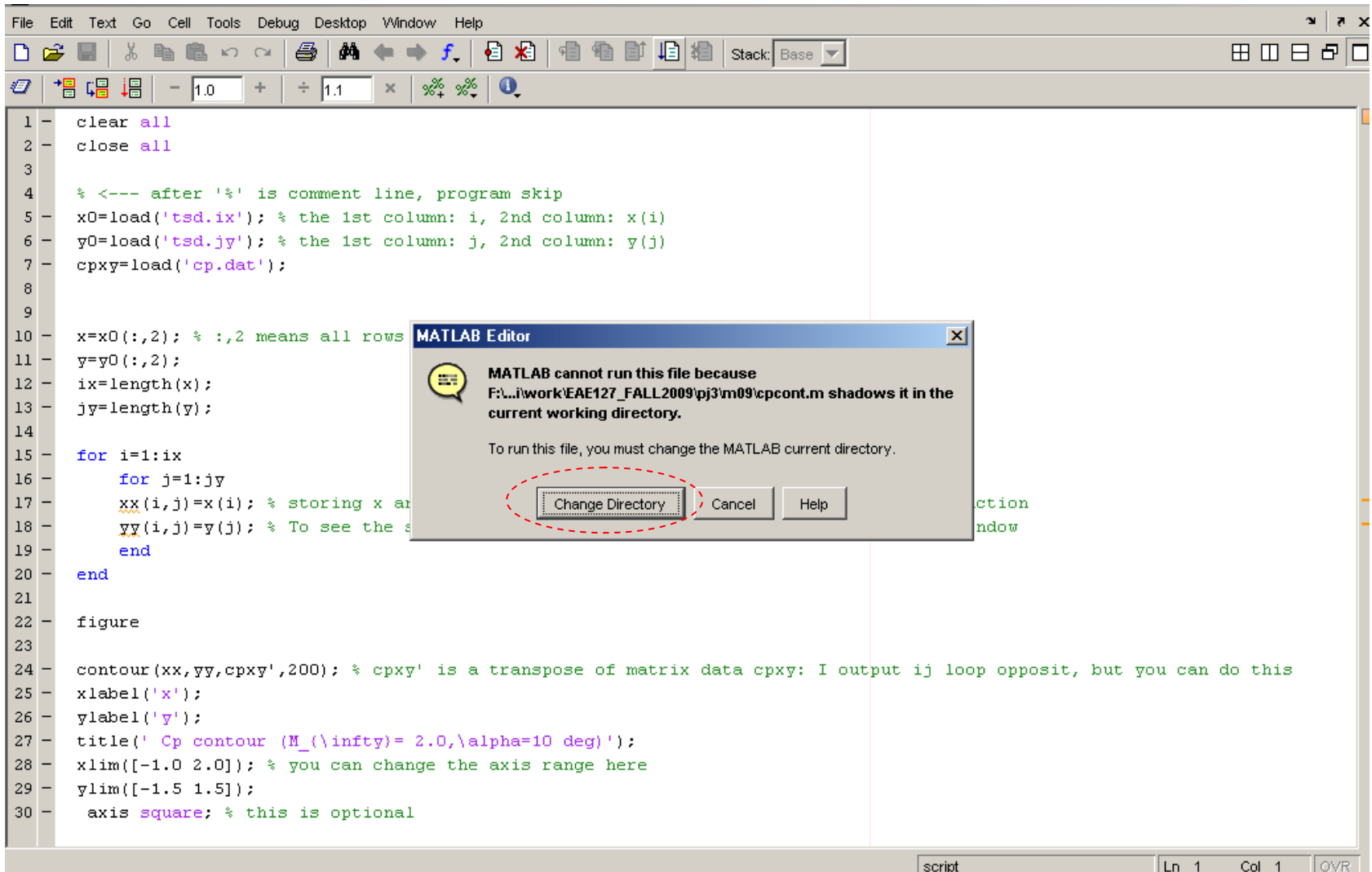
```
1 clear all
2 close all
3
4 % <--- after '%' is comment line, program skip
5 x0=load('tsd.ix'); % the 1st column: i, 2nd column: x(i)
6 y0=load('tsd.jy'); % the 1st column: j, 2nd column: y(j)
7 cpxy=load('cp.dat');
8
9
10 x=x0(:,2); % :,2 means all rows of 2nd column (is stored as 'x')
11 y=y0(:,2);
12 ix=length(x);
13 jy=length(y);
14
15 for i=1:ix
16     for j=1:jy
17         xx(i,j)=x(i); % storing x and y data in specification of the Matlab 'contour' function
18         yy(i,j)=y(j); % To see the specification type 'help contour' in Matlab command window
19     end
20 end
21
22 figure
23
24 contour(xx,yy,cpxy',200); % cpxy' is a transpose of matrix data cpxy: I output ij loop opposit, but you can do this
25 xlabel('x');
26 ylabel('y');
27 title(' Cp contour (M_{\infty}= 2.0,\alpha=10 deg)');
28 xlim([-1.0 2.0]); % you can change the axis range here
29 ylim([-1.5 1.5]);
30 axis square; % this is optional
```

A red circle highlights lines 5-7. A red box highlights the 'run' button. A callout box points to the loading lines with the text: "tsd.ix, tsd.jy and cp.dat are the input files and must be in the same folder".

run

script Ln 30 Col 33 OVR

If asked, select change directory.



The image shows a MATLAB Editor window with a script and an error dialog box. The script is as follows:

```
1 - clear all
2 - close all
3
4 % <--- after '%' is comment line, program skip
5 - x0=load('tsd.ix'); % the 1st column: i, 2nd column: x(i)
6 - y0=load('tsd.jy'); % the 1st column: j, 2nd column: y(j)
7 - cpxy=load('cp.dat');
8
9
10 - x=x0(:,2); % :,2 means all rows
11 - y=y0(:,2);
12 - ix=length(x);
13 - jy=length(y);
14
15 for i=1:ix
16     for j=1:jy
17         xx(i,j)=x(i); % storing x as
18         yy(i,j)=y(j); % To see the s
19     end
20 end
21
22 figure
23
24 contour(xx,yy,cpxy',200); % cpxy' is a transpose of matrix data cpxy: I output ij loop opposit, but you can do this
25 xlabel('x');
26 ylabel('y');
27 title(' Cp contour (M_{\infty}= 2.0, \alpha=10 deg)');
28 xlim([-1.0 2.0]); % you can change the axis range here
29 ylim([-1.5 1.5]);
30 axis square; % this is optional
```

The error dialog box, titled "MATLAB Editor", contains the following text:

MATLAB cannot run this file because
F:\...i\work\EAE127_FALL2009\pj3\m09\cpcont.m shadows it in the
current working directory.

To run this file, you must change the MATLAB current directory.

The dialog box has three buttons: "Change Directory" (circled in red), "Cancel", and "Help".

Supersonic flow C_p contour save file as bitmap etc.

