

Fuzzy Modelling

LECTURE 6

T-norm fuzzy logics

Example 6.1.

Script:

```
% Trapezoidal membership functions MFA and MFB
```

```
x1=[0:0.1:2]
```

```
y1=x1*0
```

```
x2=[2:0.1:4]
```

```
y2=1/2*x2-1
```

```
x3=[4:0.1:6]
```

```
y3=x3*0+1
```

```
x4=[0:0.1:2]
```

```
y4=x4*0+1
```

```
x5=[2:0.1:4]
```

```
y5=-1/2*x5+2
```

```
x6=[4:0.1:6]
```

```
y6=x6*0
```

```
% Matrix of functions MFA and MFB
```

```
xa=[x1 x2 x3]
```

```
ya=[y1 y2 y3]
```

```
xb=[x4 x5 x6]
```

```
yb=[y4 y5 y6]
```

```
% Product and algebraic product
```

```
yc=min(ya,yb)
```

```
yd=ya.*yb
```

```
% Plot, color, parameters, line width, markersize
```

```
plot(xa, ya, 'g', 'linewidth', 2, 'markersize', 10,  
      xb, yb, 'm', 'linewidth', 2, 'markersize', 10,  
      xa, yc, 'b-x', 'linewidth', 2, 'markersize', 10,  
      xa, yd, 'k-*', 'linewidth', 2, 'markersize', 10)
```

```
% Axis, line width, font size, grid
```

```
set(gca, 'linewidth', 2, 'fontsize', 18)
```

```
grid on
```

```
% Text, font size,
```

```
text(4.2, 0.94, 'MFA', 'fontsize', 16)
```

```
text(1.5, 0.94, 'MFB', 'fontsize', 16)
```

text(2.8,0.32 , 'MFC','fontsize',16)

text(2.8,0.17 , 'MFD','fontsize',16)

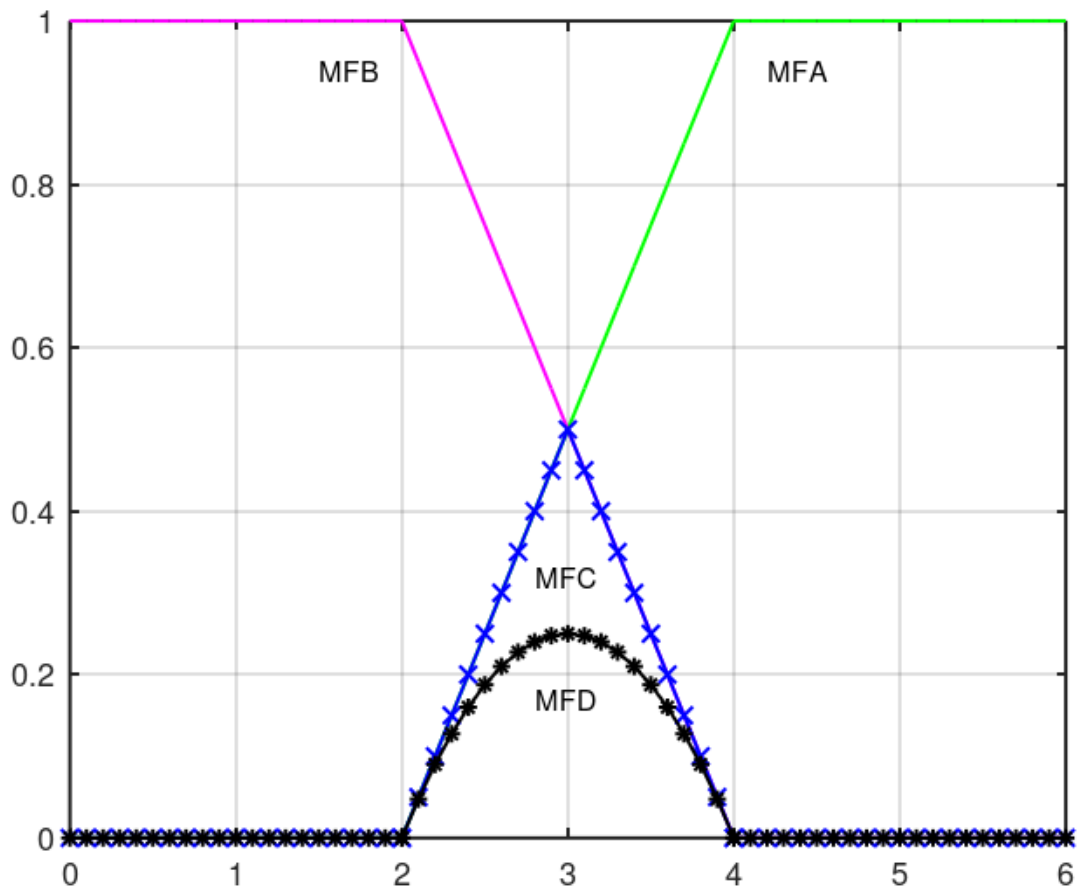


Fig. 6.1. Membership functions MFA,MFB, min product MFC and algebraic product MFD

<https://octave-online.net/>

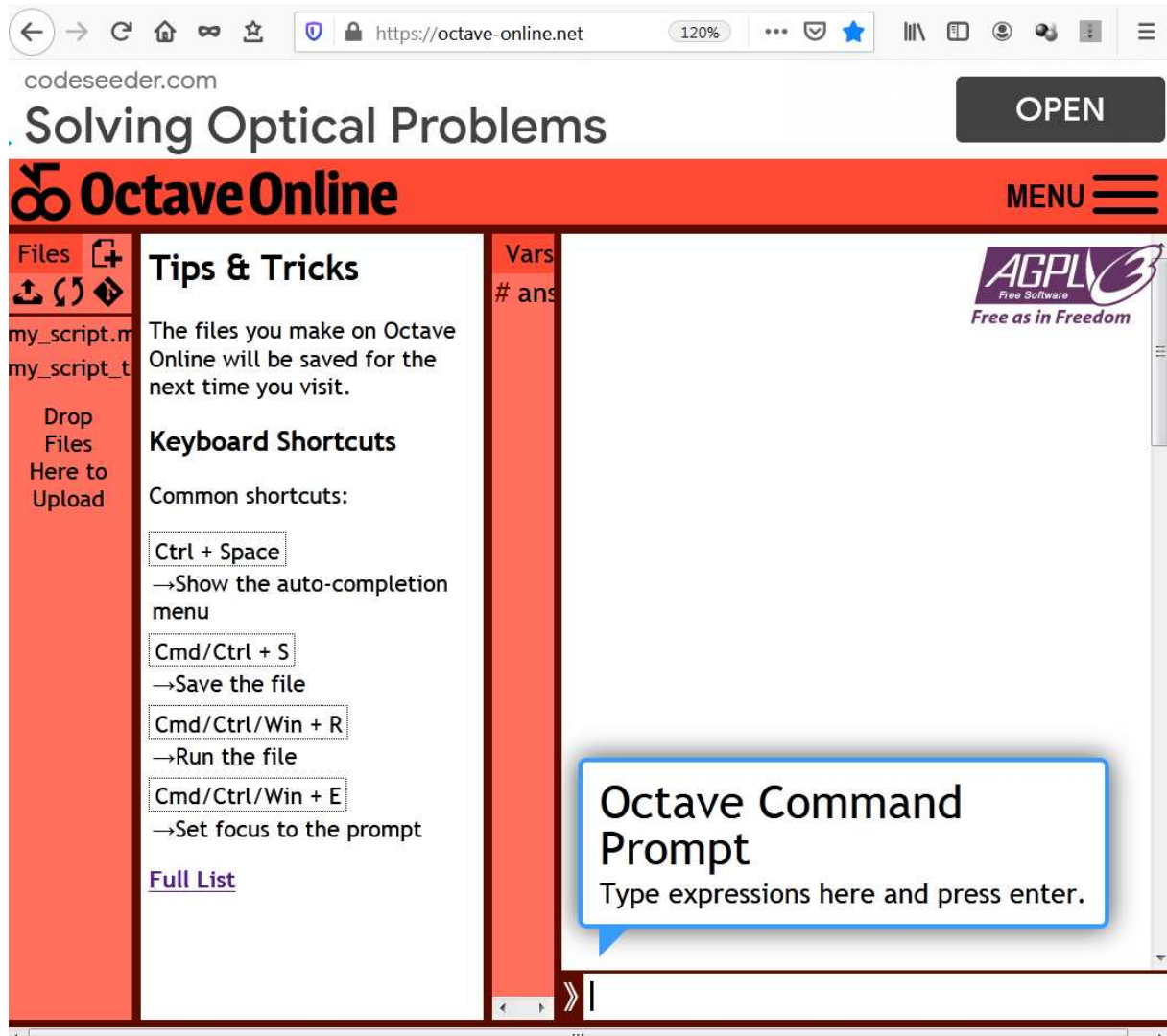










Fig. 6.2. View of Octave Online



OctaveOnline

Files

My_script_Ex_4.m

My_script_Ex_4.m

my_script.m

my_script_trapezoid.m

Drop Files Here to Upload

```

1 % Trapezoidal membership functions MFA and MFB
2 x1=[0:0.1:2]
3 y1=x1*0
4 x2=[2:0.1:4]
5 y2=1/2*x2-1
6 x3=[4:0.1:6]
7 y3=x3*0+1
8
9 x4=[0:0.1:2]
10 y4=x4*0+1
11 x5=[2:0.1:4]
12 y5=-1/2*x5+2
13 x6=[4:0.1:6]
14 y6=x6*0
15
16 % Matrix of functions MFA and MFB
17 xa=[x1 x2 x3]
18 ya=[y1 y2 y3]
19 xb=[x4 x5 x6]
20 yb=[y4 y5 y6]
21
22 % Product and algebraic product
23 yc=min(ya,yb)
24 yd=ya.*yb
25
26 % Plot, color, parameters, line width, markersize
27 plot(xa,ya,'g','linewidth', 2,'markersize', 10,
28      xb,yb,'m','linewidth', 2,'markersize', 10,
29      xa,yc,'b-x','linewidth', 2,'markersize', 10,
30      xa,yd,'k-*', 'linewidth', 2,'markersize', 10)
31
32 % Axis, line width, font size, grid
33 set(gca,'linewidth',2, 'fontsize',18)
34 grid on
35
36 % Text, font size,
37 text(4.2,0.94,'MFA','fontsize',16)
38 text(1.5,0.94,'MFB','fontsize',16)
39 text(2.8,0.32 , 'MFC','fontsize',16)
40 text(2.8,0.17 , 'MFD','fontsize',16)
41
42

```

My_script_Ex_4.m

Run

Fig. 6.3. View of Octave Online and Script