Assignment-1

Q) Implement the following **fuzzy membership function**-

(1) Triangular membership function

(2) Trapezoidal membership function

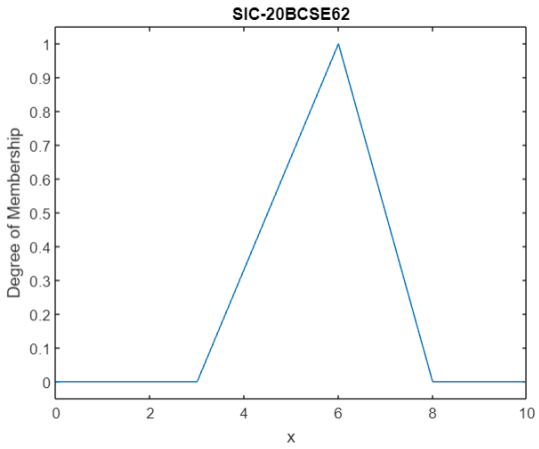
(3) Gaussian membership function

(4) Generalized Bell membership function

Solution-

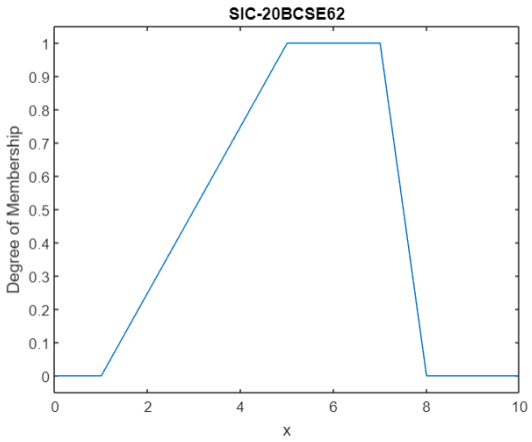
1) Triangular Membership function:

```
x = 0:0.1:10;
y = trimf(x,[3 6 8]);
plot(x,y)
title('SIC-20BCSE62')
xlabel('x')
ylabel('Degree of Membership')
ylim([-0.05 1.05])
```



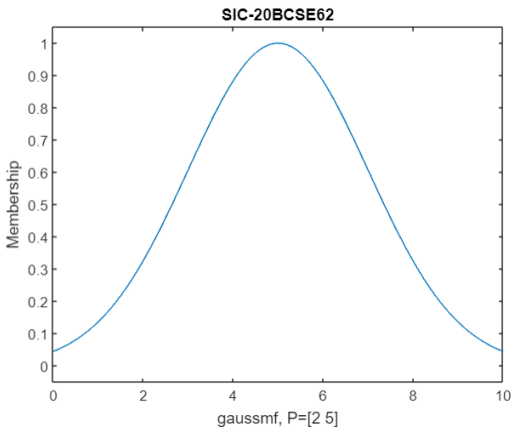
2) Trapezoidal Membership function:

```
x = 0:0.1:10;
y = trapmf(x,[1 5 7 8]);
plot(x,y)
title('SIC-20BCSE62')
xlabel('x')
ylabel('Degree of Membership')
ylim([-0.05 1.05])
```



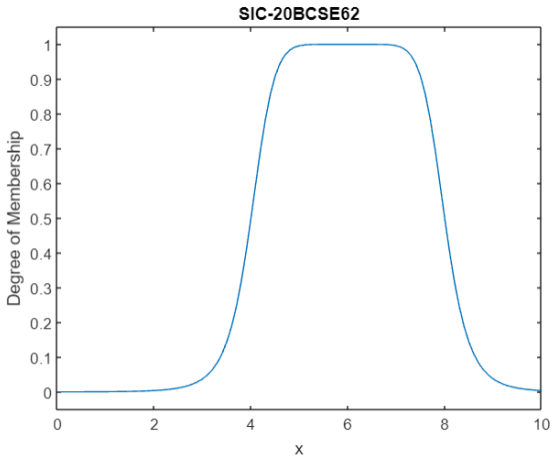
3) Gaussian membership function

```
x = 0:0.1:10;
y = gaussmf(x,[2 5]);
plot(x,y)
title('SIC-20BCSE62')
xlabel('gaussmf, P=[2 5]')
ylabel('Membership')
ylim([-0.05 1.05])
```



4) Generalized Bell membership function

```
x = 0:0.1:10;
y = gbellmf(x,[2 4 6]);
plot(x,y)
title('SIC-20BCSE62')
xlabel('x')
ylabel('Degree of Membership')
ylim([-0.05 1.05])
```



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SIC- 20BCSE62

Grp_Roll- B2_12

Assignment-2

Q) Given x= {1,2,3,4}

A= {(1,0.7), (2,0.5, (3,0.1), (4,0.5)},

B= {(2,0.8), (3,0.3)}

= ((1,0), (2,0.8), (3,0.3), (4,0)} Find the following -

(1) Minimum

(2) Product

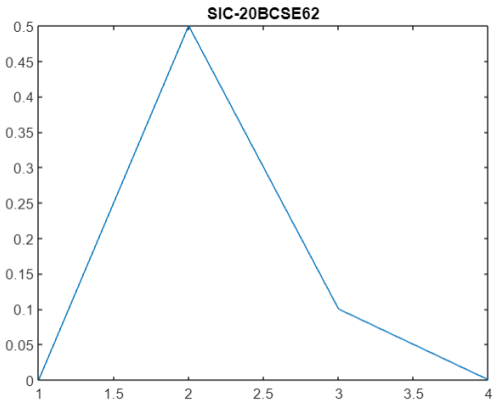
(3) Boundary product

(4) Drastic product

Solution-

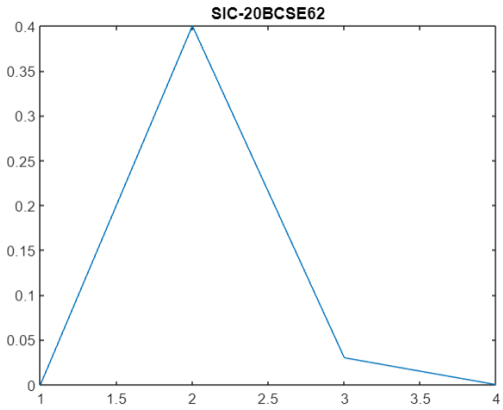
1) Minimum:

```
x = [1,2,3,4]
a = [0.7,0.5,0.1,0.6]
b = [0.0,0.8,0.3,0.0]
c = min(a,b)
plot(x,c)
title('SIC-20BCSE62')
```



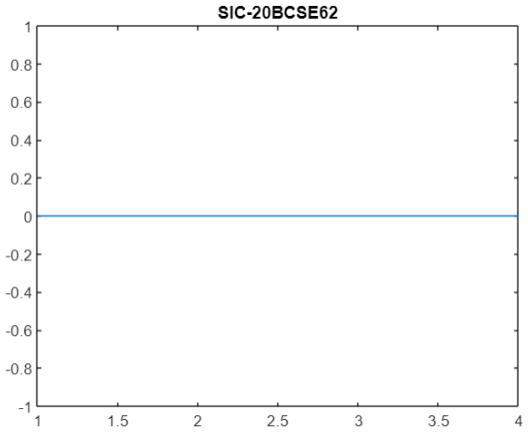
2) Product:

```
x = [1,2,3,4]
a = [0.7,0.5,0.1,0.6]
b = [0.0,0.8,0.3,0.0]
result= a .* b;
plot(x,result)
title('SIC-20BCSE62')
```



3) Boundary Product:

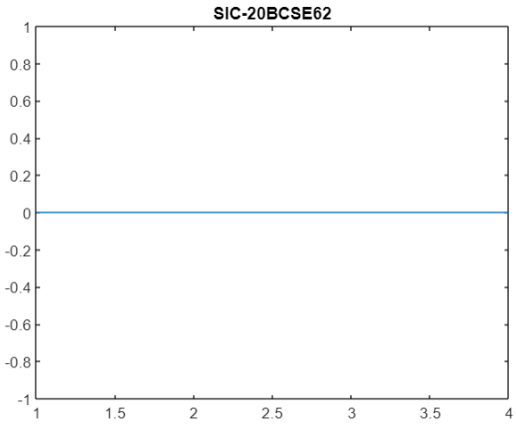
```
x = [1, 2, 3, 4];
a = [0.7, 0.5, 0.1, 0.6];
b = [0.0, 0.8, 0.3, 0.0];
c= max(0,a .*b-1)
plot(x,c)
title('SIC-20BCSE62')
```



4) Drastic Product:

```
x = [1, 2, 3, 4];
a = [0.7, 0.5, 0.1, 0.6];
b = [0.0, 0.8, 0.3, 0.0];
c = zeros(size(a));
for i = 1:length(a)
    if b(i) == 1
        c(i) = a(i);
    elseif a(i) == 1
        c(i) = b(i);
    elseif a(i) < 1 && b(i) < 1
        c(i) = 0;
    end
end

plot(x, c);
title("SIC-20BCSE62")
```



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