```
%PERSONAL DETAILS

%MATLAB PROGRAMMING ASSIGNMENT II

%ROLL NUMBER: SYCO01

%PRN: 1212121212

%NAME: DINESH BABAN KUTE
```

```
%Triangular Membership Function

%Syntax: y = trimf(x,params)
```

```
%Example
```

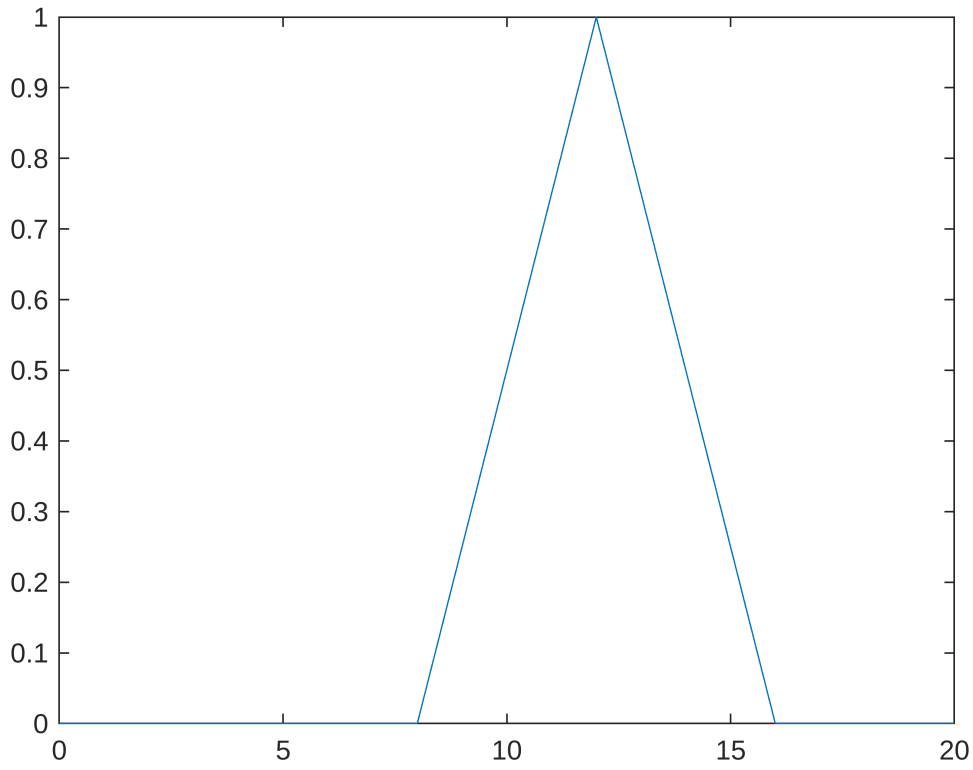
```
x1=0:0.2:20
```

```
x1 = 1×101
         0    0.2000    0.4000    0.6000    0.8000    1.0000    1.2000    1.4000 ···
```

```
y1=trimf(x,[8 12 16])
```

```
y1 = 1×101
         0         0         0         0         0         0         0         0 ···
```

```
plot(x,y)
```




```
%Trapezoidal Membership Function

%Syntax: y = trapmf(x,params)
```

```
%Example
```

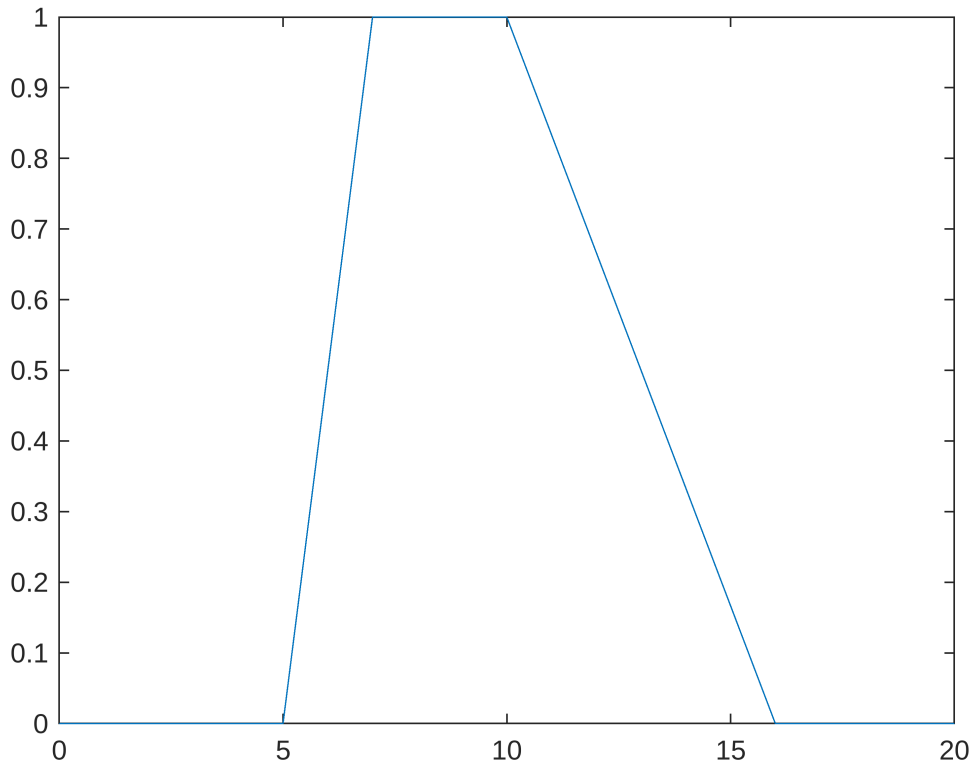
```
x2=0:0.2:20
```

```
x2 = 1×101
         0    0.2000    0.4000    0.6000    0.8000    1.0000    1.2000    1.4000 ···
```

```
y2 = trapmf(x,[5 7 10 16])
```

```
y2 = 1×101
         0         0         0         0         0         0         0         0 ···
```

```
plot(x2,y2)
```




```
%Sigmoidal Membership Function

%Syntax: y = sigmf(x,params)
```

```
%Example
```

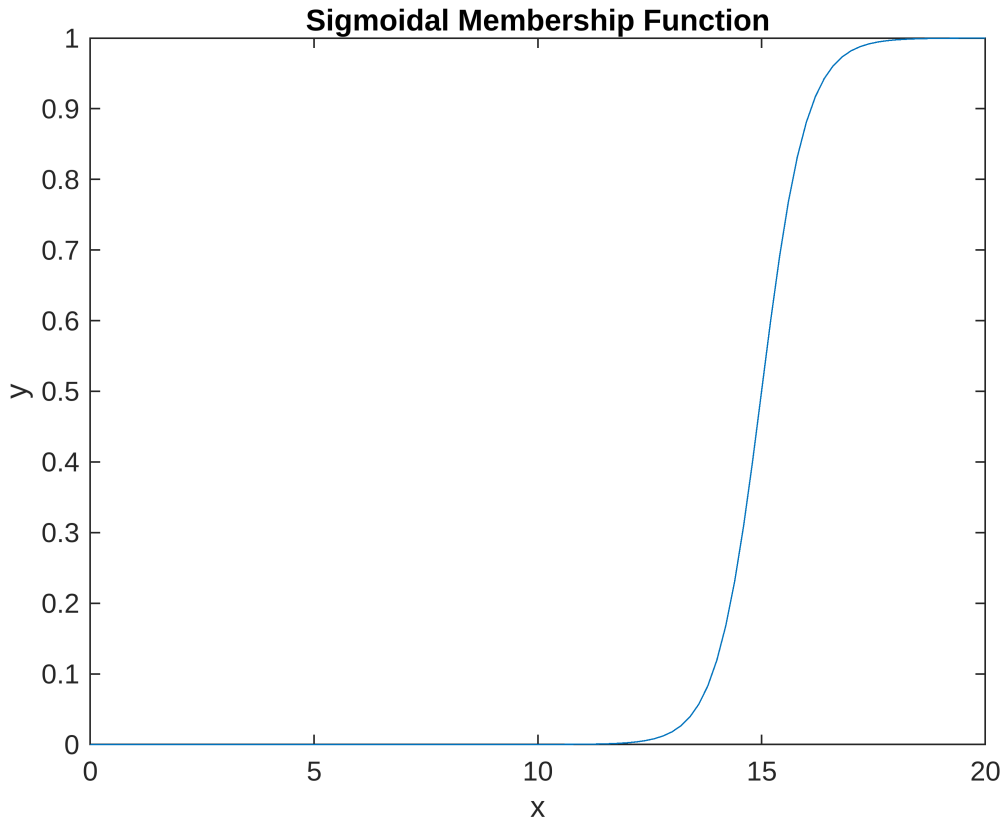
```
x3=0:0.2:20
```

```
x3 = 1×101
         0    0.2000    0.4000    0.6000    0.8000    1.0000    1.2000    1.4000 ···
```

```
y3 = sigmf(x,[2 15])
```

```
y3 = 1×101
    0.0000    0.0000    0.0000    0.0000    0.0000    0.0000    0.0000    0.0000 ···
```

```
plot(x3,y3)
```




```
%Gaussian Membership Function

%Syntax: y = gaussmf(x,params)
```

```
%Example
```

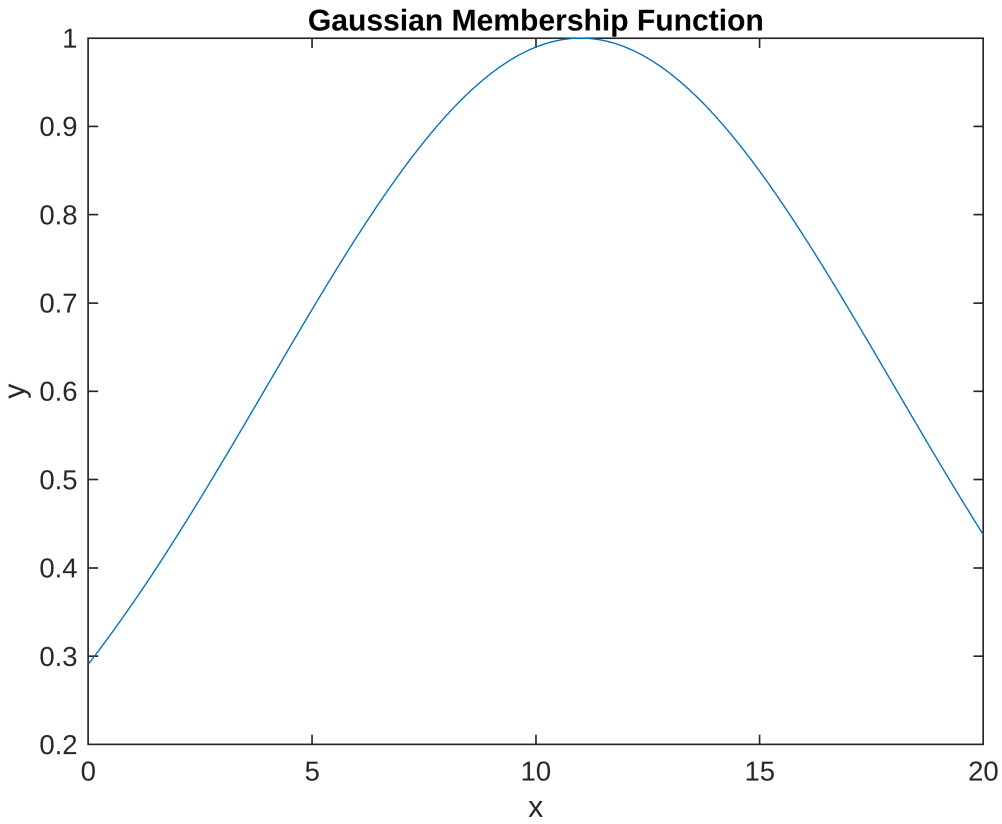
```
x4=0:0.2:20
```

```
x4 = 1×101
         0    0.2000    0.4000    0.6000    0.8000    1.0000    1.2000    1.4000 ···
```

```
y4 = gaussmf(x,[7 11])
```

```
y4 = 1×101
    0.2909    0.3042    0.3177    0.3317    0.3459    0.3604    0.3753    0.3905 ···
```

```
plot(x4,y4)
```



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```

```
%Defuzzification Methods
```

```
% 1) Center of Gravity / Centroid
```

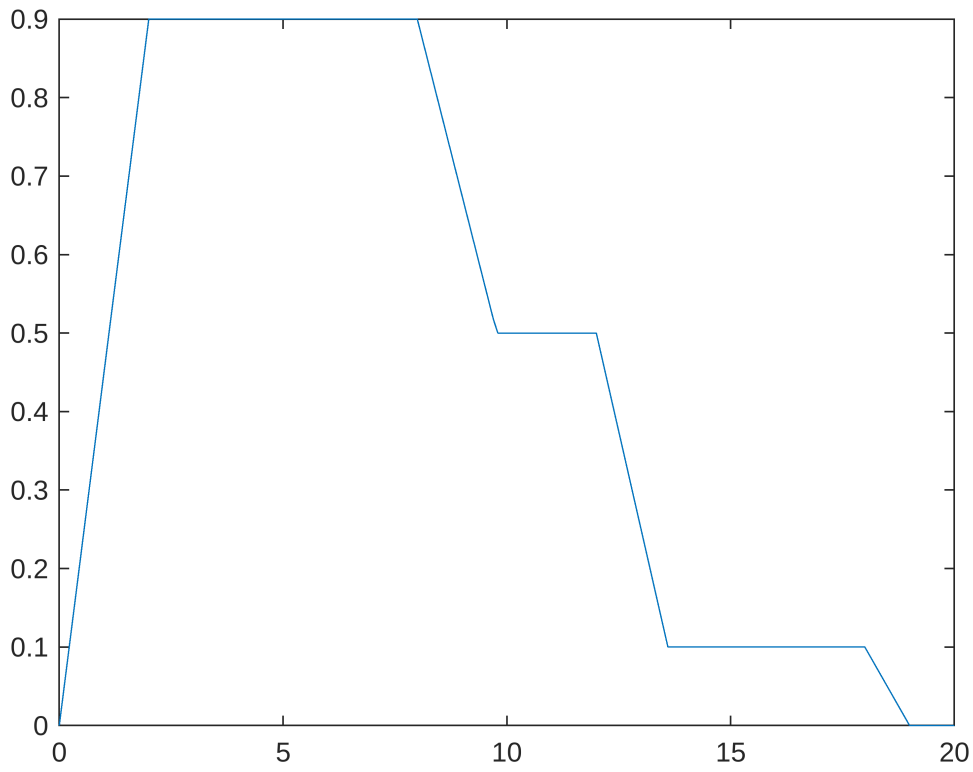
```
x = 0:0.1:20
```

```
x = 1×201
         0    0.1000    0.2000    0.3000    0.4000    0.5000    0.6000    0.7000 ···
```

```
mf1 = trapmf(x,[0 2 8 12]);
mf2 = trapmf(x,[5 7 12 14]);
mf3 = trapmf(x,[12 13 18 19]);
mf = max(0.5*mf2,max(0.9*mf1,0.1*mf3))
```

```
mf = 1×201
         0    0.0450    0.0900    0.1350    0.1800    0.2250    0.2700    0.3150 ···
```

```
plot(x,mf)
```




```
xCentroid = defuzz(x,mf,'centroid')
```

```
xCentroid = 6.7719
```

```
% 2)Middle of Maxima (MOM)
```

```
xMOM = defuzz(x,mf,'mom')
```

```
xMOM = 5
```

```
% 3) First of Maxima / Smallest of Maxima (SOM)
```

```
xSOM = defuzz(x,mf,'som')
```

```
xSOM = 2
```

```
% 4) Last of Maxima / Largest of Maxima (LOM)
```

```
xLOM = defuzz(x,mf,'lom')
```

```
xLOM = 8
```

MAMDANI INFERENCE SYSTEM USING MATLAB