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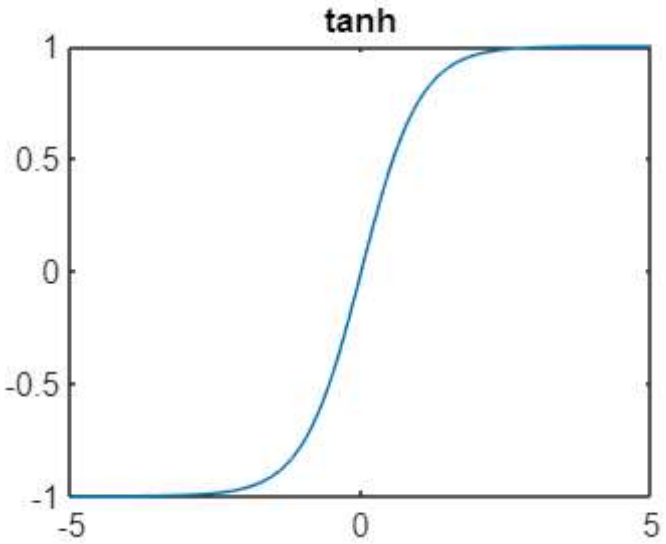
ex1 tanh function

```
x=-5:0.1:5;
y=((exp(x)-exp(-x))./(exp(x)+exp(-x)));
plot(x,y),title('tanh')
```



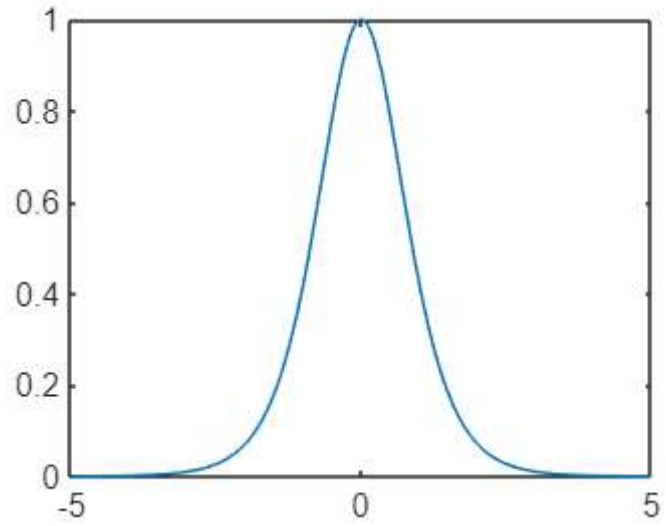
calculate differenciation

```
syms x
f=(exp(x)-exp(-x))./(exp(x)+exp(-x));
df=diff(f)
```

```
df =
```

$$1-\frac{(e^{-x}-e^{x})^{2}}{(e^{-x}+e^{x})^{2}}$$

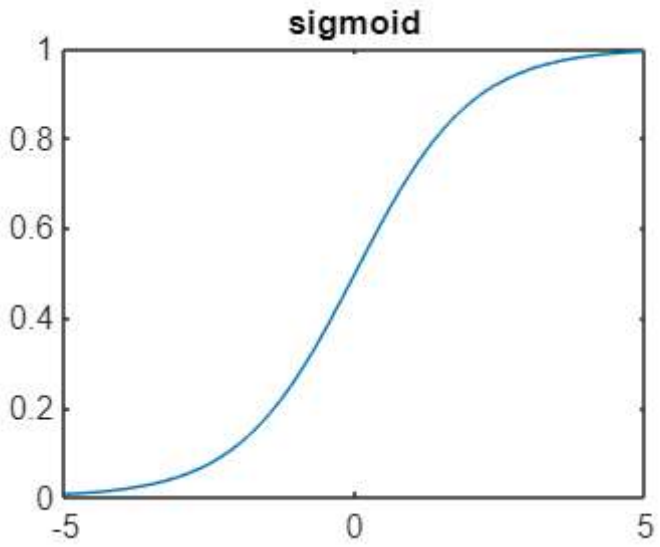
```
fplot(df)
```



sigmoid function

```
x=-5:0.1:5;
```

```
y=1./(1+exp(-x*1));
plot(x,y),title('sigmoid')
```



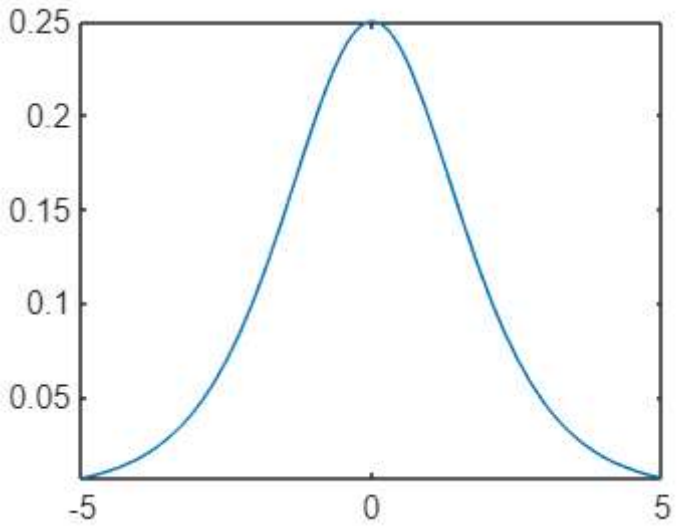
calculate differenciation

```
syms x
f2=1./(1+exp(-x*1));
df2=diff(f2)
```

```
df2 =
```

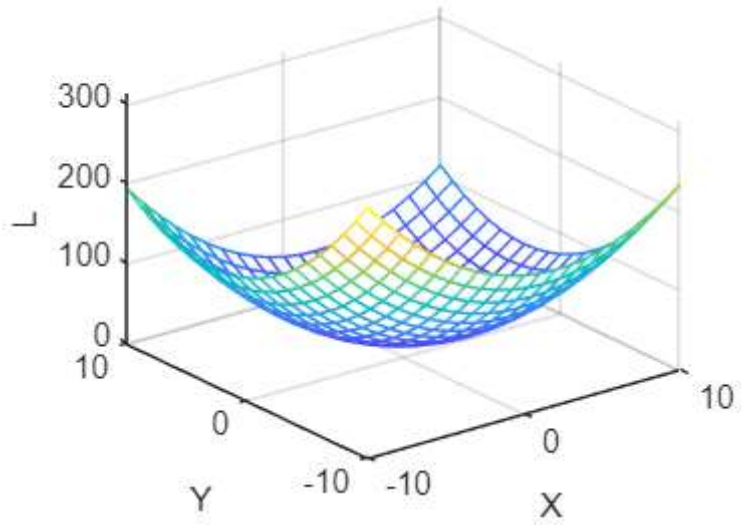
$$\frac{e^{-x}}{(e^{-x}+1)^2}$$

```
fplot(df2)
```



ex2 Gradient descent algorithm

```
[X,Y]=meshgrid(-10:10,-10:10);
L=(X-2).^2+(Y-3).^2;
mesh(X,Y,L)
xlabel('X'),ylabel('Y'),zlabel('L');
```




```
hold on
x(1)=-10;
y(1)=-10;
L(1)=(x(1)-2).^2+(y(1)-3).^2;
plot3(x(1),y(1),L(1),'or');
l=0.05;
for i=2:100
    dx=2*(x(i-1)-2);
    dy=2*(y(i-1)-3);
    x(i)=x(i-1)-1*dx;
    y(i)=y(i-1)-1*dy;
    L(i)=(x(i)-2).^2+(y(i)-3).^2;
    plot3(x(i),y(i),L(i),'or');
end
```