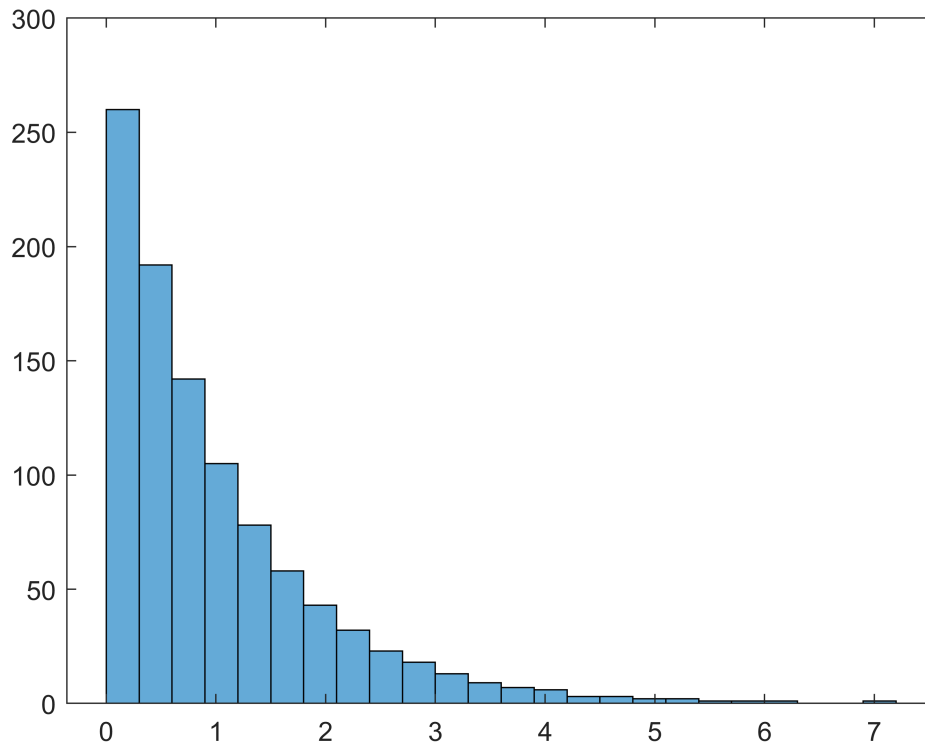


## 1.6 - Making Distributions using Inverse Cumulative Distribution function and Uniform Distribution

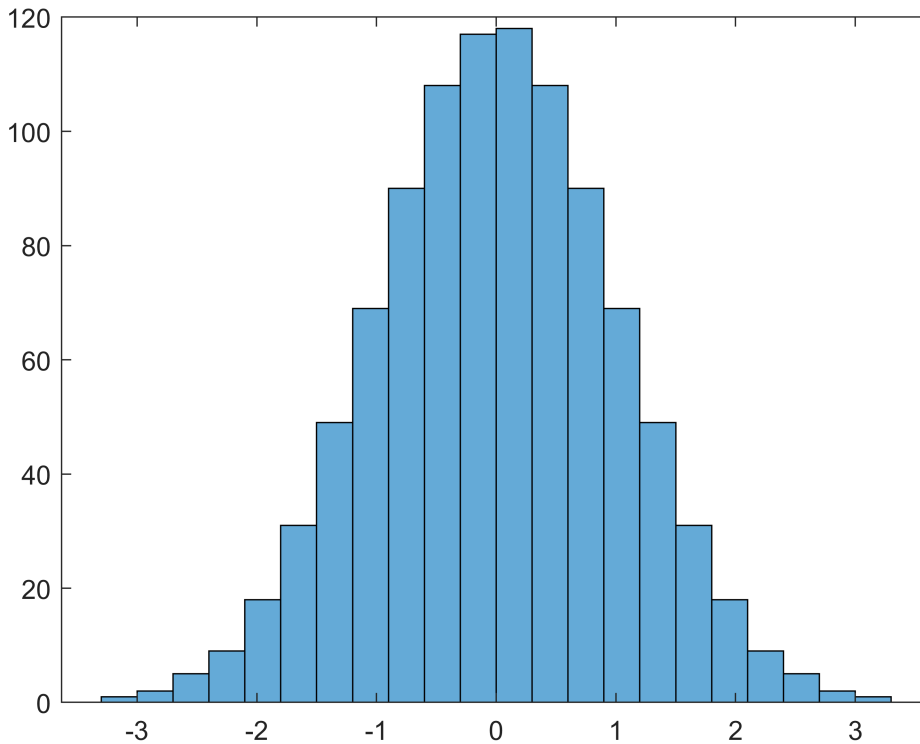
### *Exponential distribution*

```
p = 1:-0.001:0;  
X = icdf('exponential',p,1);  
histogram(X)
```



### *Normal distribution*

```
p = 1:-0.001:0;  
X = icdf('normal',p,0,1);  
histogram(X)
```



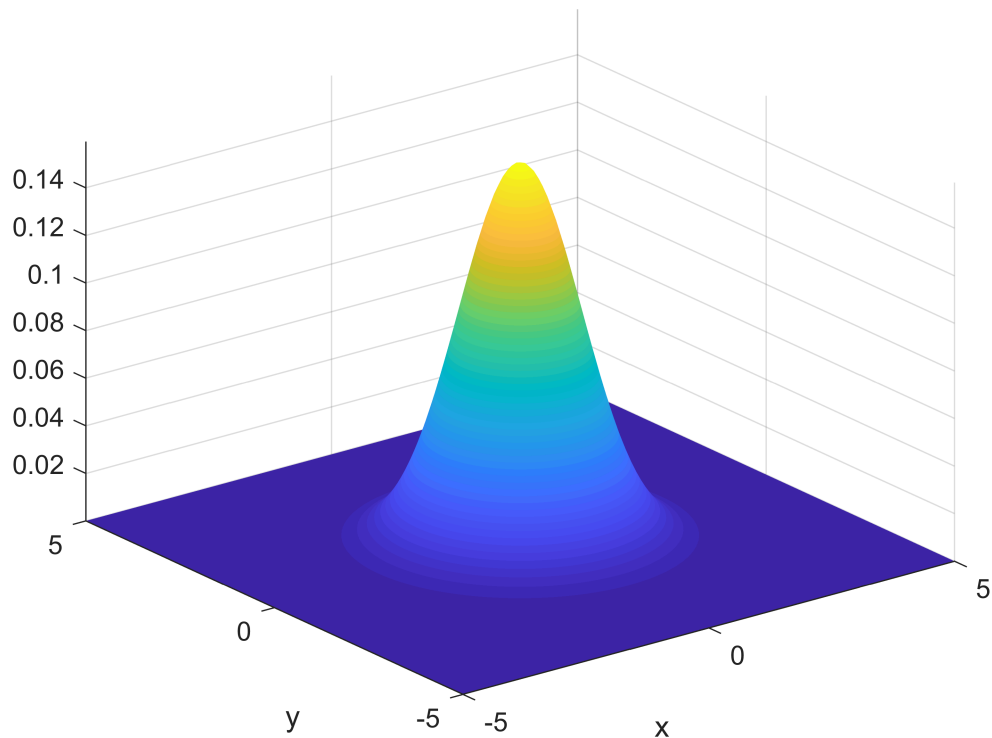
## 2.6 - effect of correlation coefficient

$$\sigma_x = 1, \sigma_y = 1, \rho = 0$$

```

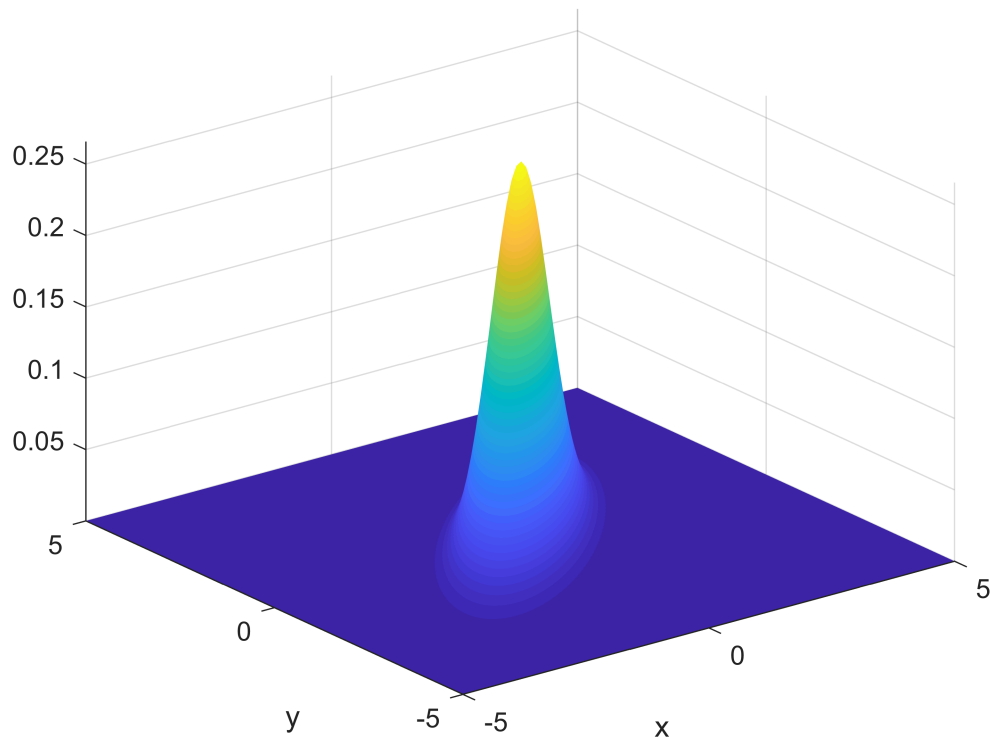
N = 5.0;
x= -N:0.1:N;
y=x;
[X,Y]=meshgrid(x,y);
r = 0;
sigx = 1;
sigy = 1;
G = (1/(1-r.^2))*(((X./sigx).^2)+((Y./sigy).^2) -2*r*(X./sigx)*(Y./sigy));
z=(1/(2*pi*sigx*sigy*sqrt(1-r.^2)).*exp(-G.*0.5));
surf(X,Y,z);
xlabel('x'), ylabel('y')
shading interp
axis tight

```



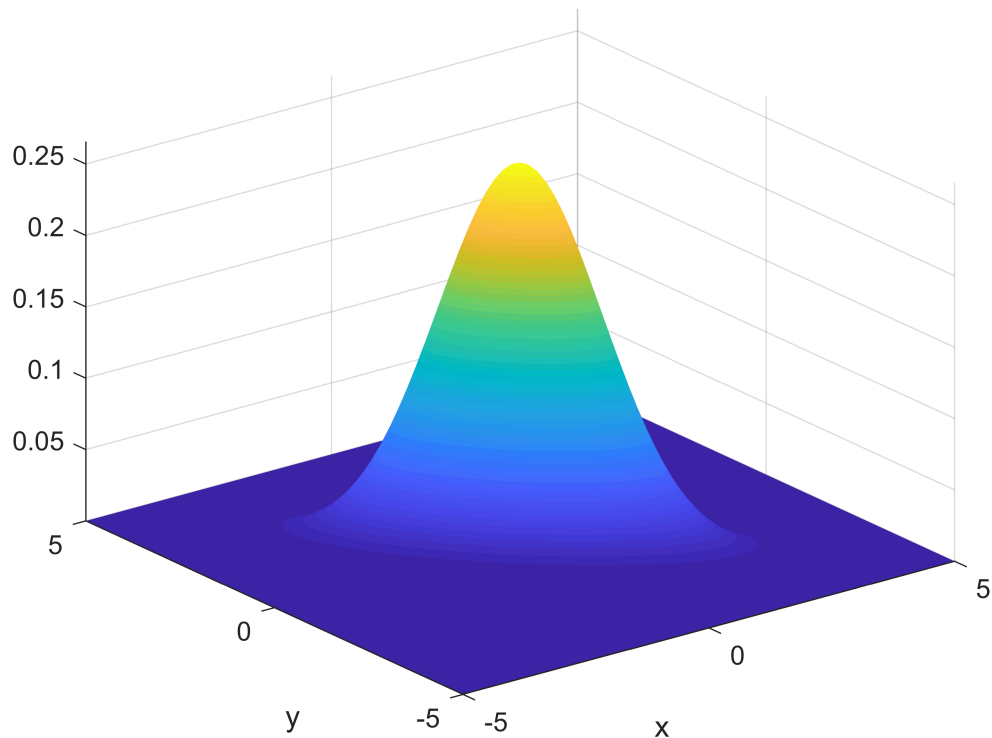
$\sigma_x = 1, \sigma_y = 1, \rho = 0.8$

```
N = 5.0;
x= -N:0.1:N;
y=x;
[X,Y]=meshgrid(x,y);
r = 0.8;
sigx = 1;
sigy = 1;
G = (1/(1-r^2))*(((X./sigx).^2)+((Y./sigy).^2) -2*r*(X./sigx).*(Y./sigy));
z=(1/(2*pi*sigx*sigy*sqrt(1-r^2)).*exp(-G.*0.5));
surf(X,Y,z);
xlabel('x'), ylabel('y')
shading interp
axis tight
```



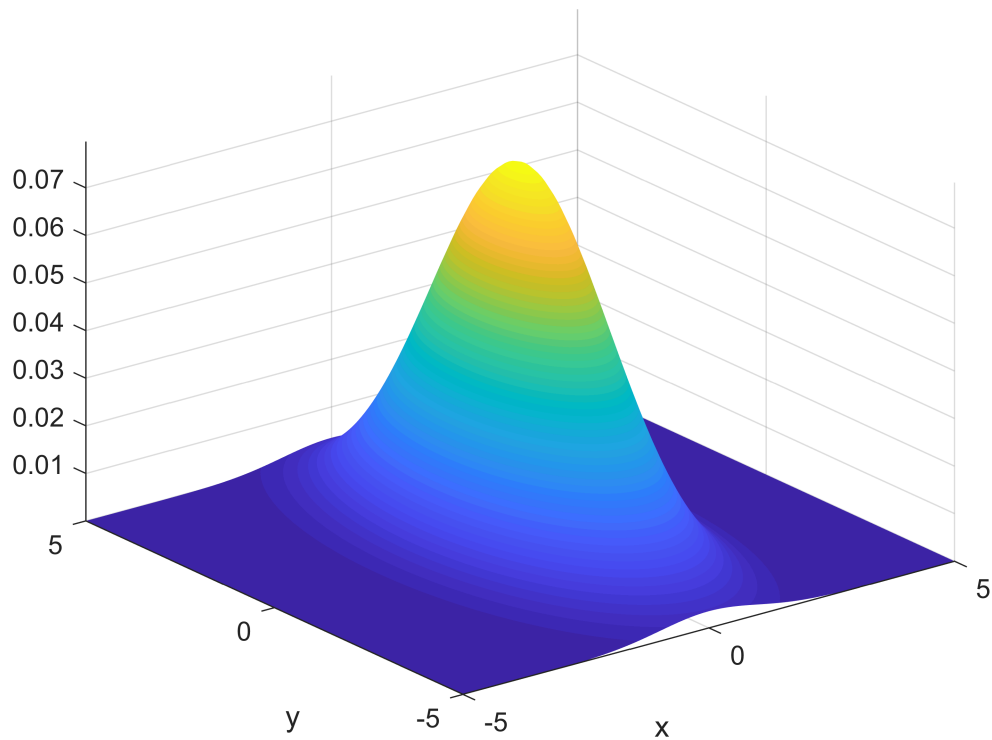
$\sigma_x = 1, \sigma_y = 1, \rho = -0.8$

```
N = 5.0;
x= -N:0.1:N;
y=x;
[X,Y]=meshgrid(x,y);
r = -0.8;
sigx = 1;
sigy = 1;
G = (1/(1-r^2))*(((X./sigx).^2)+((Y./sigy).^2) -2*r*(X./sigx).*(Y./sigy));
z=(1/(2*pi*sigx*sigy*sqrt(1-r^2)).*exp(-G.*0.5));
surf(X,Y,z);
xlabel('x'), ylabel('y')
shading interp
axis tight
```



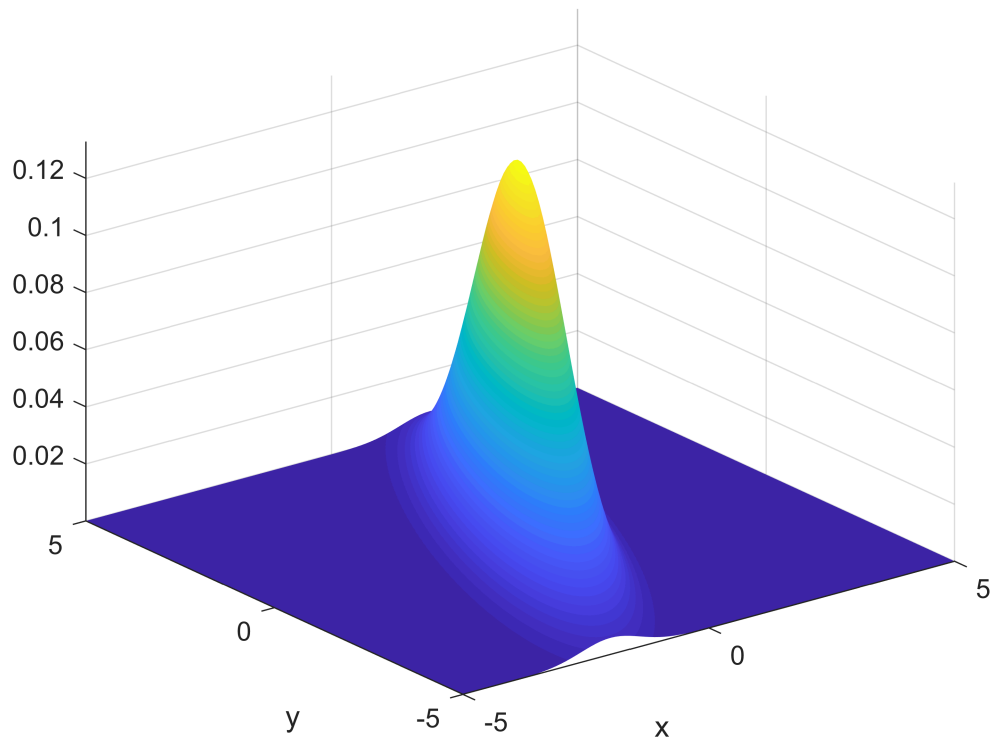
$\sigma_x = 1, \sigma_y = 2, \rho = 0$

```
N = 5.0;
x= -N:0.1:N;
y=x;
[X,Y]=meshgrid(x,y);
r = 0;
sigx = 1;
sigy = 2;
G = (1/(1-r^2))*(((X./sigx).^2)+((Y./sigy).^2) -2*r*(X./sigx).*(Y./sigy));
z=(1/(2*pi*sigx*sigy*sqrt(1-r^2)).*exp(-G.*0.5));
surf(X,Y,z);
xlabel('x'), ylabel('y')
shading interp
axis tight
```



$\sigma_x = 1, \sigma_y = 2, \rho = 0.8$

```
N = 5.0;
x= -N:0.1:N;
y=x;
[X,Y]=meshgrid(x,y);
r = 0.8;
sigx = 1;
sigy = 2;
G = (1/(1-r^2))*(((X./sigx).^2)+((Y./sigy).^2) -2*r*(X./sigx).*(Y./sigy));
z=(1/(2*pi*sigx*sigy*sqrt(1-r^2)).*exp(-G.*0.5));
surf(X,Y,z);
xlabel('x'), ylabel('y')
shading interp
axis tight
```



$\sigma_x = 1, \sigma_y = 5, \rho = 0.8$

```
N = 5.0;
x= -N:0.1:N;
y=x;
[X,Y]=meshgrid(x,y);
r = 0.8;
sigx = 1;
sigy = 5;
G = (1/(1-r^2))*(((X./sigx).^2)+((Y./sigy).^2) -2*r*(X./sigx).*(Y./sigy));
z=(1/(2*pi*sigx*sigy*sqrt(1-r^2)).*exp(-G.*0.5));
surf(X,Y,z);
xlabel('x'), ylabel('y')
shading interp
axis tight
```

