

POISSON DISTRIBUTION And NORMAL DISTRIBUTION in RStudio

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**Aim-To Study Poisson and Normal Distribution
in R**

Code-

```
p5=dpois(x=5,lambda = 7)
```

```
p5
```

```
round(p5,4)
```

```
p5=dpois(x=0:5,lambda = 7)
```

```
p5
```

```
round(p5,4)
```

```
sum(dpois(0:5,lambda = 7))
```

```
round(ppois(q=5,lambda = 7,lower.tail = F))
```

```
n=100
```

```
X.val=0:100
```

```
P.val=dpois(X.val,4)
```

```
EX=sum(X.val*P.val)
```

```
EX
```

```
Var=sum((X.val-EX)^2*P.val)
```

```
Var
```

```
dpois(0:10,2)
```

```
p=data.frame(0:10,dpois(0:10,2))
```

```
p
```

```
round(p,4)
```

```
ppois(0:10,2)
```

```
ppois(16,lambda = 12)
```

```
ppois(16,lambda = 12,lower=FALSE)
```

```
0:10
```

```
round(dpois(10:2),3)
```

```
ppois(6,2)
```

```
sum(dpois(0:6,2))
```

```
1-ppois(6,2)
```

```
round(cbind(0:10,dpois(0:10,2),ppois(0:10,2)),3)
```

```
plot(0:10,dpois(0:10,2),type = "h",xlab = "y",ylab =  
"p(y)",main="poisson Distribution (mu=2)")
```

```
x=seq(-10,10,by=0.1)
```

```
x
```

```
y=dnorm(x,mean =2.5,sd=0.5)
```

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

```
x=seq(0,1,by=0.02)
```

```
y=qnorm(x,mean = 2,sd=1)
plot(x,y)
n=50
y=rnorm(n)
y
hist(y,main="Title-Normal distribution")
x=seq(-3,3,length=200)
y=dnorm(x,mean=0,sd=1)
plot(x,y)
plot(x,y,type="l")
```

Output-

```
> p5=dpois(x=5,lambda = 7)
> p5
[1] 0.1277167
> round(p5,4)
[1] 0.1277
> p5=dpois(x=0:5,lambda = 7)
> p5
[1] 0.000911882 0.006383174 0.022341108
0.052129252 0.091226192 0.127716668
> round(p5,4)
```

```

[1] 0.0009 0.0064 0.0223 0.0521 0.0912 0.1277
> sum(dpois(0:5,lambda = 7))
[1] 0.3007083
> round(ppois(q=5,lambda = 7,lower.tail = F))
[1] 1
> n=100
> X.val=0:100
> P.val=dpois(X.val,4)
> EX=sum(X.val*P.val)
> EX
[1] 4
> Var=sum((X.val-EX)^2*P.val)
> Var
[1] 4
> dpois(0:10,2)
[1] 1.353353e-01 2.706706e-01 2.706706e-01
1.804470e-01 9.022352e-02 3.608941e-02
[7] 1.202980e-02 3.437087e-03 8.592716e-04
1.909493e-04 3.818985e-05
> p=data.frame(0:10,dpois(0:10,2))
> p
  X0.10 dpois.0.10..2.
1    0 1.353353e-01

```

2	1	2.706706e-01
3	2	2.706706e-01
4	3	1.804470e-01
5	4	9.022352e-02
6	5	3.608941e-02
7	6	1.202980e-02
8	7	3.437087e-03
9	8	8.592716e-04
10	9	1.909493e-04
11	10	3.818985e-05

```
> round(p,4)
```

```
X0.10 dpois.0.10..2.
```

1	0	0.1353
2	1	0.2707
3	2	0.2707
4	3	0.1804
5	4	0.0902
6	5	0.0361
7	6	0.0120
8	7	0.0034
9	8	0.0009
10	9	0.0002

```
11 10 0.0000
```

```
> ppois(0:10,2)
```

```
[1] 0.1353353 0.4060058 0.6766764 0.8571235  
0.9473470 0.9834364 0.9954662 0.9989033
```

```
[9] 0.9997626 0.9999535 0.9999917
```

```
> ppois(16,lambda = 12)
```

```
[1] 0.898709
```

```
> ppois(16,lambda = 12,lower=FALSE)
```

```
[1] 0.101291
```

```
> 0:10
```

```
[1] 0 1 2 3 4 5 6 7 8 9 10
```

```
> round(dpois(10:2),3)
```

```
Error in dpois(10:2) : argument "lambda" is missing,  
with no default
```

```
> ppois(6,2)
```

```
[1] 0.9954662
```

```
> sum(dpois(0:6,2))
```

```
[1] 0.9954662
```

```
> 1-ppois(6,2)
```

```
[1] 0.004533806
```

```
> round(cbind(0:10,dpois(0:10,2),ppois(0:10,2)),3)
```

```
 [,1] [,2] [,3]
```

```
[1,] 0 0.135 0.135
```

```

[2,] 1 0.271 0.406
[3,] 2 0.271 0.677
[4,] 3 0.180 0.857
[5,] 4 0.090 0.947
[6,] 5 0.036 0.983
[7,] 6 0.012 0.995
[8,] 7 0.003 0.999
[9,] 8 0.001 1.000
[10,] 9 0.000 1.000
[11,] 10 0.000 1.000
> plot(0:10,dpois(0:10,2),type = "h",xlab = "y",ylab =
"p(y)",main="poisson Distribution (mu=2)")
> x=seq(-10,10,by=0.1)
> x
[1] -10.0 -9.9 -9.8 -9.7 -9.6 -9.5 -9.4 -9.3 -9.2 -9.1
-9.0 -8.9 -8.8 -8.7
[15] -8.6 -8.5 -8.4 -8.3 -8.2 -8.1 -8.0 -7.9 -7.8 -7.7
-7.6 -7.5 -7.4 -7.3
[29] -7.2 -7.1 -7.0 -6.9 -6.8 -6.7 -6.6 -6.5 -6.4 -6.3
-6.2 -6.1 -6.0 -5.9
[43] -5.8 -5.7 -5.6 -5.5 -5.4 -5.3 -5.2 -5.1 -5.0 -4.9
-4.8 -4.7 -4.6 -4.5
[57] -4.4 -4.3 -4.2 -4.1 -4.0 -3.9 -3.8 -3.7 -3.6 -3.5
-3.4 -3.3 -3.2 -3.1

```

```
[71] -3.0 -2.9 -2.8 -2.7 -2.6 -2.5 -2.4 -2.3 -2.2 -2.1  
-2.0 -1.9 -1.8 -1.7
```

```
[85] -1.6 -1.5 -1.4 -1.3 -1.2 -1.1 -1.0 -0.9 -0.8 -0.7  
-0.6 -0.5 -0.4 -0.3
```

```
[99] -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7  
0.8 0.9 1.0 1.1
```

```
[113] 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1  
2.2 2.3 2.4 2.5
```

```
[127] 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5  
3.6 3.7 3.8 3.9
```

```
[141] 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9  
5.0 5.1 5.2 5.3
```

```
[155] 5.4 5.5 5.6 5.7 5.8 5.9 6.0 6.1 6.2 6.3  
6.4 6.5 6.6 6.7
```

```
[169] 6.8 6.9 7.0 7.1 7.2 7.3 7.4 7.5 7.6 7.7  
7.8 7.9 8.0 8.1
```

```
[183] 8.2 8.3 8.4 8.5 8.6 8.7 8.8 8.9 9.0 9.1  
9.2 9.3 9.4 9.5
```

```
[197] 9.6 9.7 9.8 9.9 10.0
```

```
> y=dnorm(x,mean =2.5,sd=0.5)
```

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

```
> x=seq(0,1,by=0.02)
```

```
> y=qnorm(x,mean = 2,sd=1)
```

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

```
> n=50
```



```
> y=rnorm(n)
```

```
> y
```

```
[1] 0.846892897 -0.454285825 0.351019407  
0.414954363 0.384533066 -1.032902882
```

```
[7] 0.272948678 1.282829504 1.876356378  
-1.198255282 -0.029746989 -0.889568853
```

```
[13] -0.714659106 1.204398497 1.206153061  
1.496060264 -1.376881501 -0.002153945
```

```
[19] -1.530230268 0.237096044 -1.263933790  
-2.503589292 0.637018207 0.719709504
```

```
[25] -1.107803970 -0.195403952 -0.119133500  
-0.279695362 0.149765737 0.090098402
```

```
[31] -1.855932091 -1.508165936 -0.135405077  
-0.386838463 0.946219693 0.680907757
```

```
[37] 0.841410108 0.100185713 0.813732875  
-1.639257671 1.175594328 -2.750659415
```

```
[43] 1.316024998 -0.347536874 -1.444035257  
-0.901930685 1.256864165 -0.198515347
```

```
[49] 0.479824274 0.637716125
```

```
> hist(y,main="Title-Normal distribution")
```

```
> x=seq(-3,3,lenght=200)
```

Warning message:

In seq.default(-3, 3, lenght = 200) :

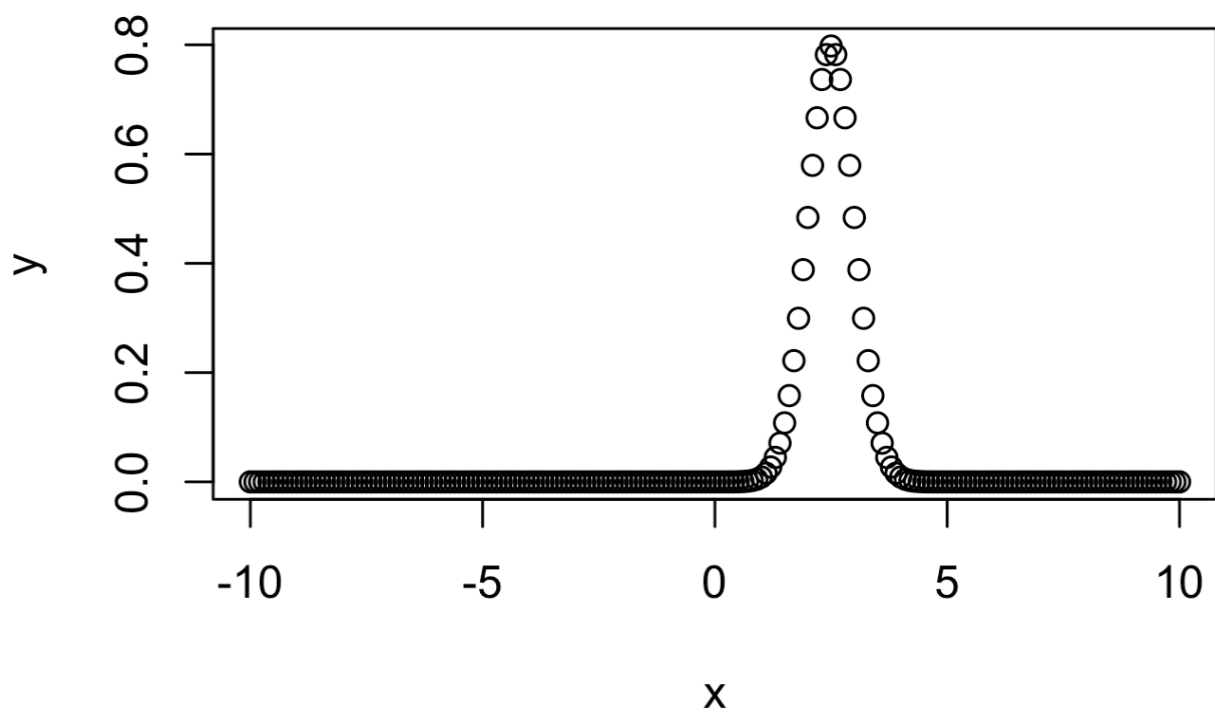
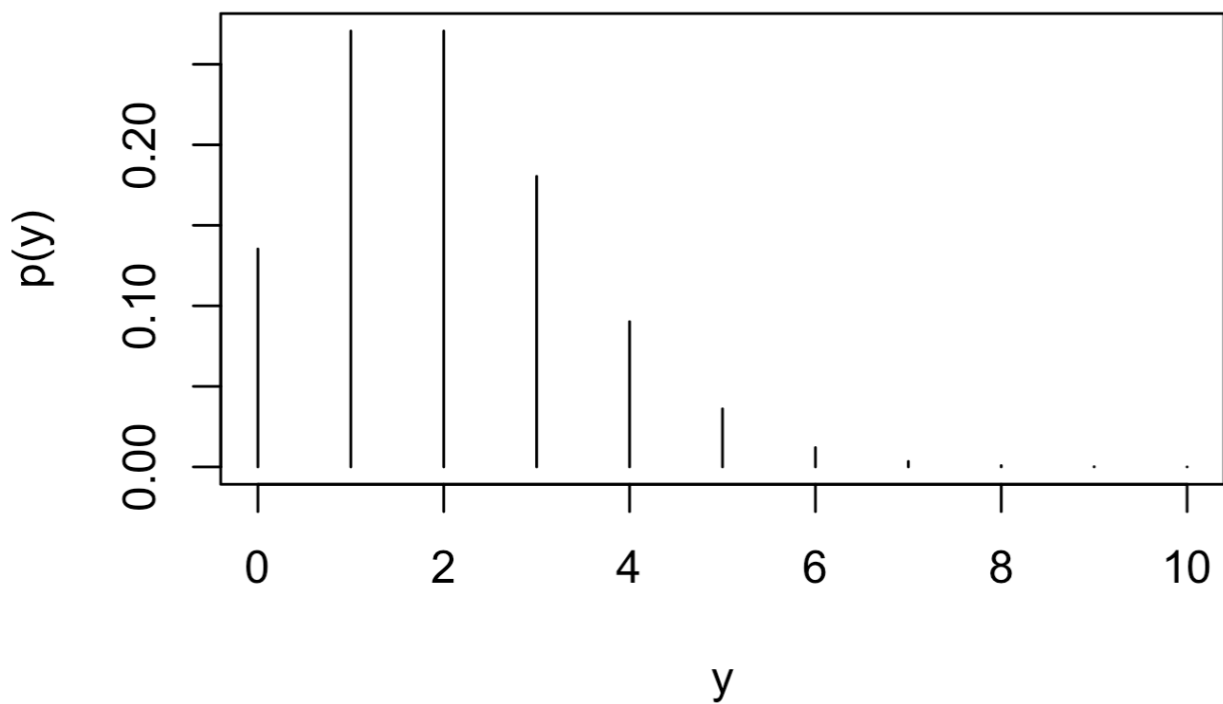
extra argument 'lenght' will be disregarded

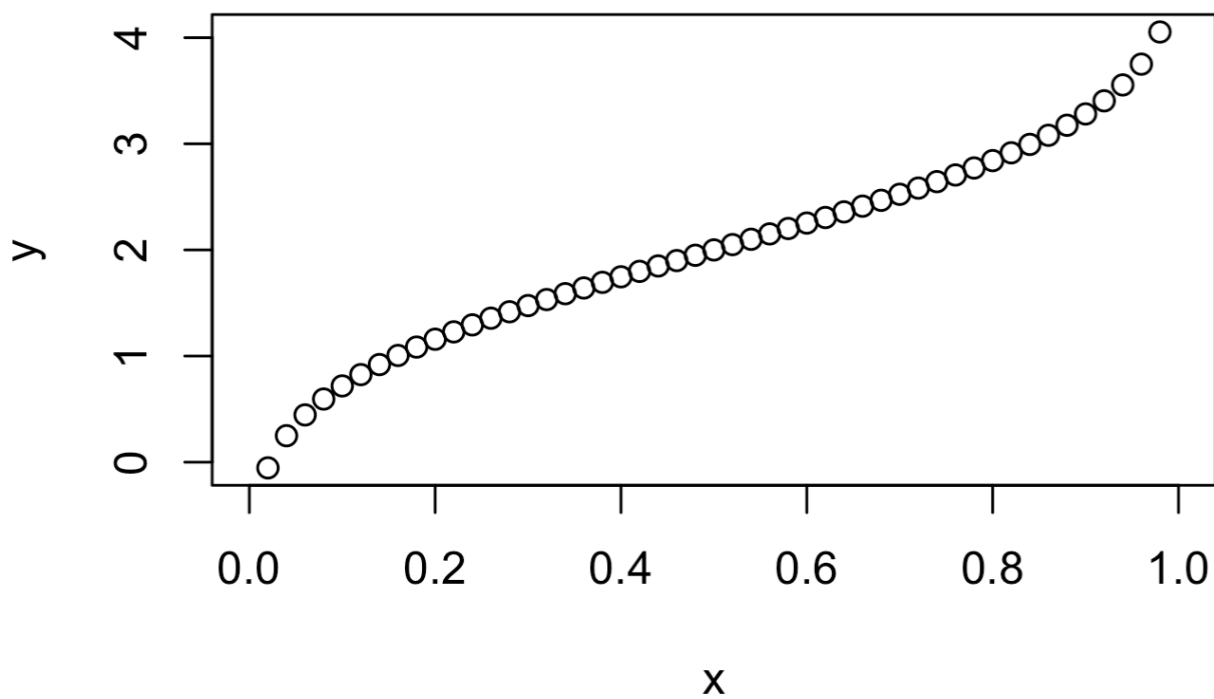
```
> y=dnorm(x,mean=0,sd=1)
```

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

```
> plot(x,y,type="l")
```

poisson Distribution (mu=2)





Title-Normal distribution

