

Fitting and Plotting of Binomial Distribution

PRANAVCHENDUR T K

15BCE1097

Aim:

Fitting and Plotting of Binomial Distribution using R

Program:

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# dbinom(k,n,p) binomial(n,p) density at K:Pr(X=k)
# pbinom(k,n,p) binomial(n,p) CDF at K:Pr(X<=k)

#Prob1. Find the probability of getting two '2' among ten dice
# Syntax is dbinom and n=10,x=2,p=1/6
dbinom(2,size = 10,prob = 1/6)
[1] 0.29071

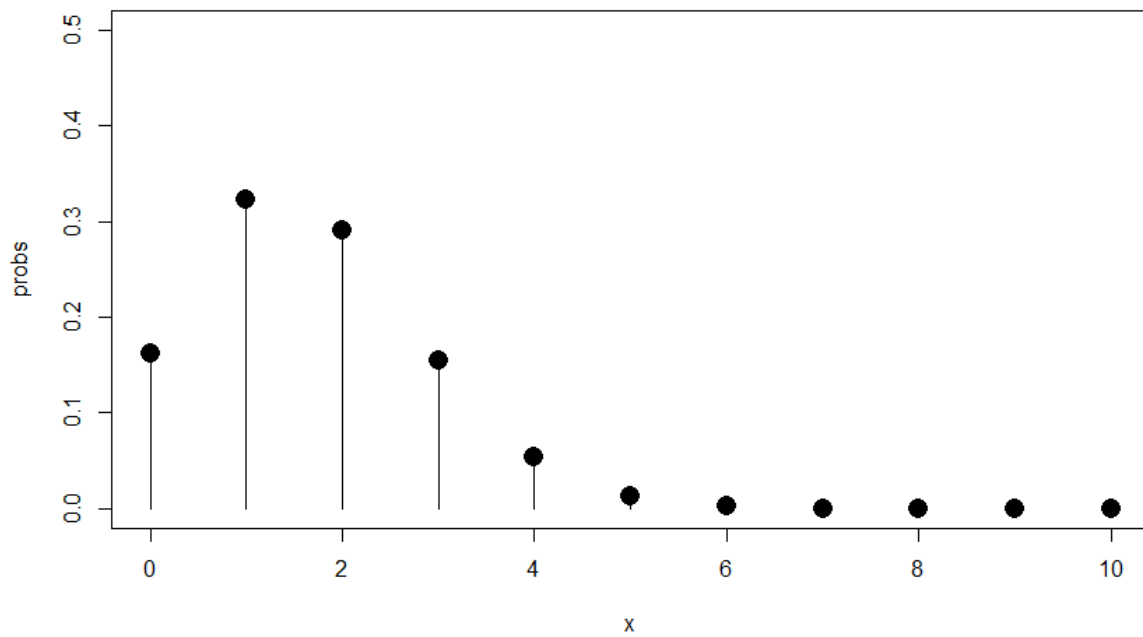
> #Prob2. Find the P(2) by using binomial probability formula
> choose(10,2)*(1/6)^2*(5/6)^8
[1] 0.29071

> #Prob3. Find the table for BIN(n=10,P=1/6)
> x=c(0:10)

> probs = dbinom(x=c(0:10),size = 10,prob = 1/6)

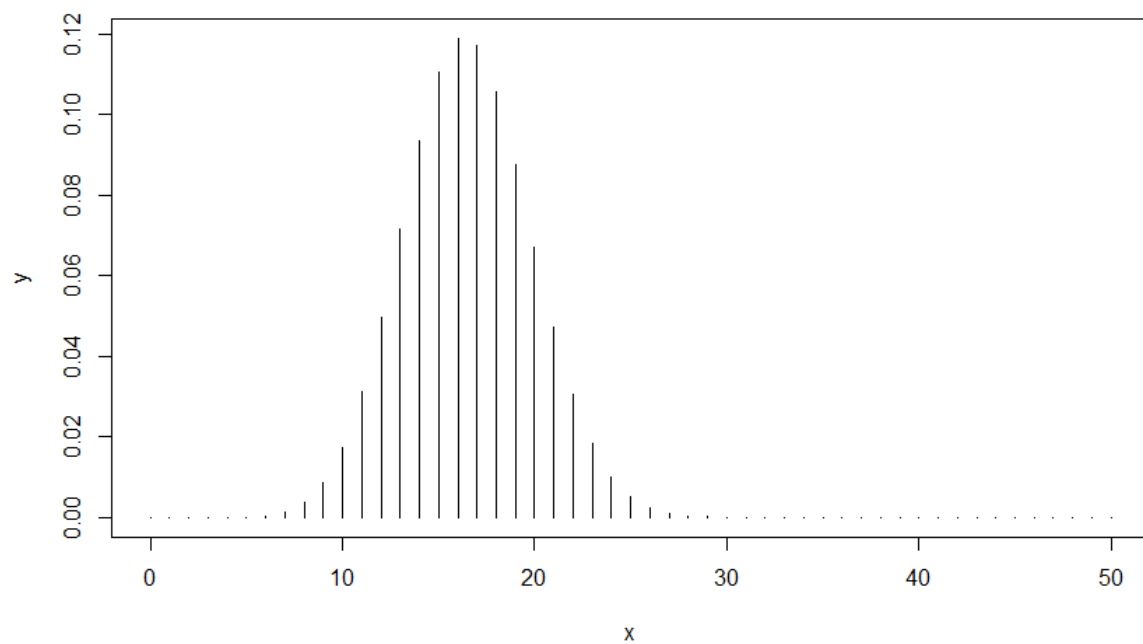
> data.frame(x,probs)
  x      probs
1  0 1.615056e-01
2  1 3.230112e-01
3  2 2.907100e-01
4  3 1.550454e-01
5  4 5.426588e-02
6  5 1.302381e-02
7  6 2.170635e-03
8  7 2.480726e-04
9  8 1.860544e-05
10 9 8.269086e-07
11 10 1.653817e-08

> #Plot1 Histogram
> plot(data.frame(x,probs),type="h", xlim=c(0,10),ylim=c(0,0.5))
points(0:10,probs,pch=16,cex=2)
```



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> #Plot 3 with n=50 P=0.33
> x=0:50

> y=dbinom(x,size = 50,prob=0.33)
> plot(x,y,type = "h")
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#ASSIGNMENT
# For a binomial (7,1/4) random variable named x
# i.Compute the probability(ies) of two success
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# ii.Compute the probability(ies) for whole space
# iii.Compute the probability(ies) in a table
# iv.Show the shape of this binomial distribution

pbinom(4,size = 12,prob = 0.2)

[1] 0.9274445

> #Show that Binomial distribution variance is less than mean with Binomial
variable follows (7,1/4)
> n=7

> p=1/4

> px=dbinom(0:n,n,p)

> x=0:n

> Ex=sum(x*px)

> Ex
[1] 1.75

> var=sum(x^2*px)-Ex^2

> var
[1] 1.3125

> #Prob1
> # a. #P(x=5) with parameter 7
> p5=dpois(x=5,lambda = 7)

> round(p5,4)
[1] 0.1277

> #b. P(x=0)+P(x=1)+.....+P(x=5)
>
> p5= dpois(x=0:5,lambda = 7)

> round(p5,4)
[1] 0.0009 0.0064 0.0223 0.0521 0.0912 0.1277

> #c.P(x<=5)
> sum(dpois(0:5,lambda = 7))
[1] 0.3007083

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