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Batch	C1
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Tutorial Number	TUT_4-P2-R software practical on probability distributions.
Date	8-03-2024

Binomial Distribution

Q.1 If X is Binomial Distribution $B(\underline{n},\underline{p})$ where n=50 p=0.35

Write R-program to evaluate and print (i) P(X=15) (ii) $P(X\leq 26)$ (iii) $P(X\geq 17)$

Code

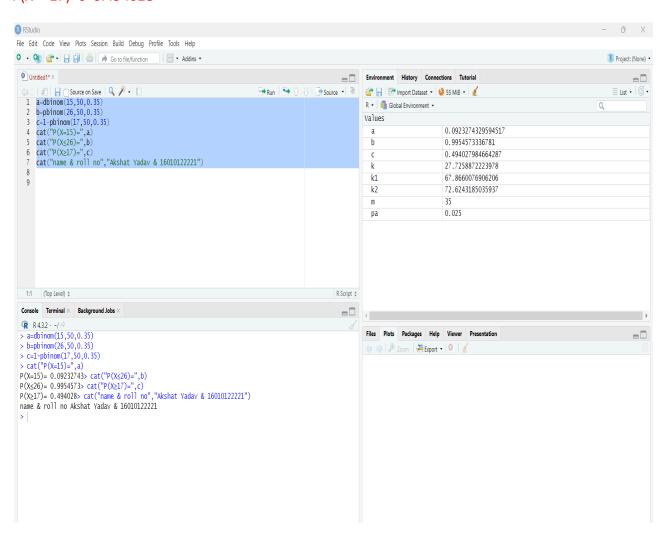
```
a=dbinom(15,50,0.35)
b=pbinom(26,50,0.35)
c=1-pbinom(17,50,0.35)
cat("P(X=15)=",a)
cat("P(X≤26)=",b)
cat("P(X≥17)=",c)
cat("name & roll no","Akshat Yadav & 16010122221")
```

Output:-

P(X=15)=a=0.09232743

P(X<=26)=b=0.9954573

P(X>=17)=c=0.494028



```
Q.2 If X is Poisson Distribution with mean 35
```

Write R-program to evaluate and print (i) P(X=0) (ii) $P(X\le12)$ (iii) $P(22\le X\le35)$

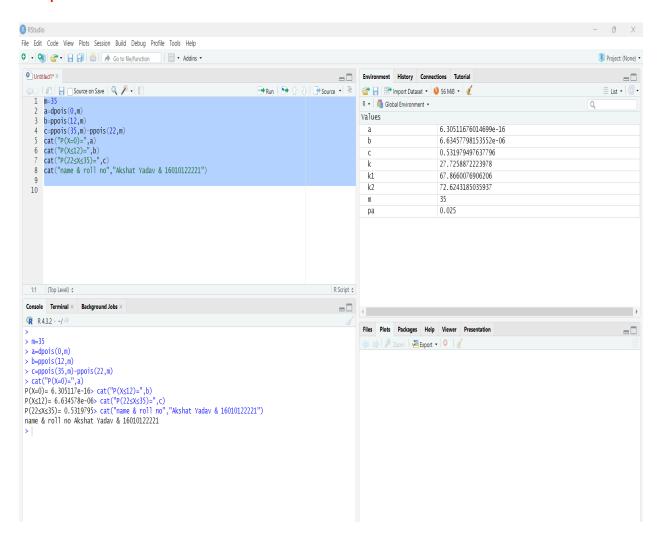
CODE

$$m = 35$$

$$cat("P(22 \le X \le 35) = ",c)$$

cat("name & roll no","Akshat Yadav & 16010122221")

Output

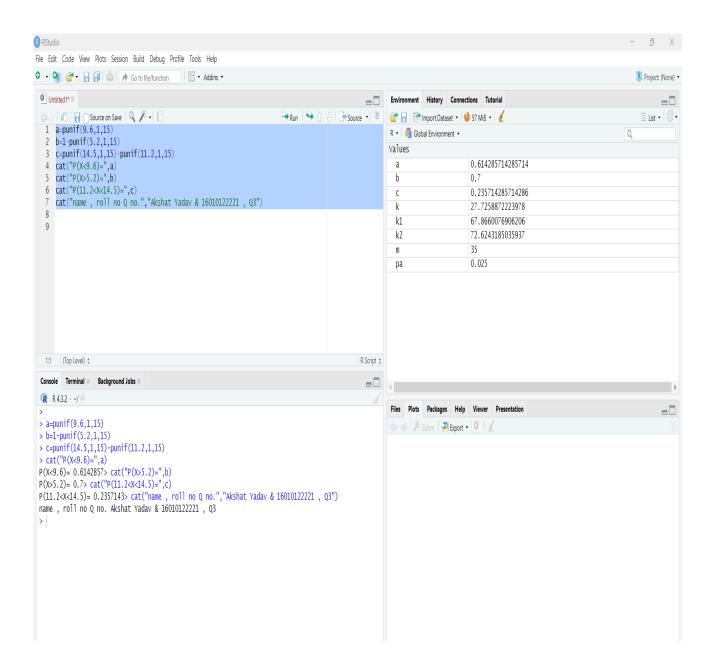


Q.3 If X is Uniform Distribution over the range (1,15). Write R-program to evaluate and print (i) P(X < 9.6) (ii) P(X > 5.2) (iii) P(11.2 < X < 14.5)

Code:

```
a=punif(9.6,1,15)
b=1-punif(5.2,1,15)
c=punif(14.5,1,15)-punif(11.2,1,15)
cat("P(X<9.6)=",a)
cat("P(X>5.2)=",b)
cat("P(11.2<X<14.5)=",c)
cat("name, roll no Q no.","Akshat Yadav & 16010122221, Q3")
```

OUTPUT



Q.4 If X is Exponential Distribution with mean 40.

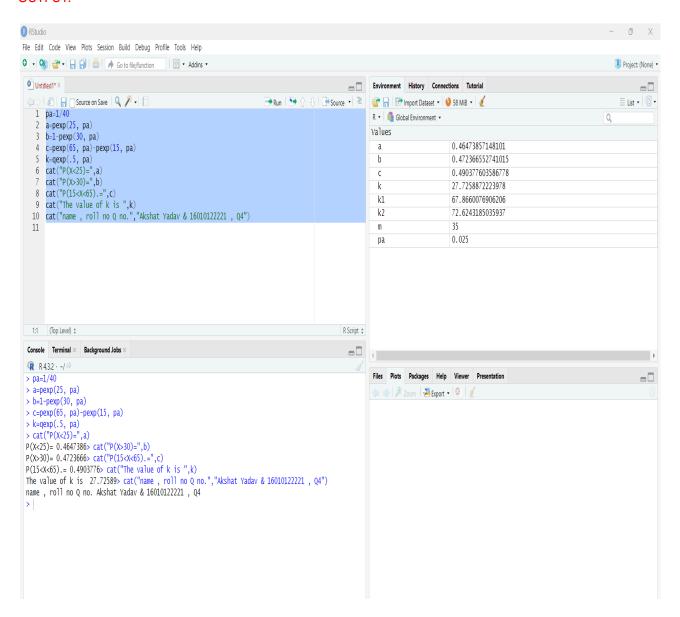
Write R-program to evaluate and print

Find value of k such that P(X < k) = 0.5

CODE:

```
pa=1/40
a=pexp(25, pa)
b=1-pexp(30, pa)
c=pexp(65, pa)-pexp(15, pa)
k=qexp(.5, pa)
cat("P(X<25)=",a)
cat("P(X>30)=",b)
cat("P(15<X<65).=",c)
cat("The value of k is ",k)
cat("name , roll no Q no.","Akshat Yadav & 16010122221 , Q4")
```

OUTPUT:



Q.5 If X is Normal Distribution with mean 60 and standard deviation 15.

Write R-program to evaluate and print (i) P(X<88) (ii) P(X>35) (iii) P(70< X<95).

Find value of k1 such that P(X < k1) = 0.7. Also find k2 such that P(X > k2) = 0.84

CODE:

```
a=pnorm(88,60,15)
b=1-pnorm(35,60,15)
c=pnorm(95,60,15)-pnorm(70,60,15)
k1=qnorm(.7,60,15)
k2=qnorm(.84,60,15)
cat("P(X<88) =",a)
cat("P(X>35) =",b)
cat("P(70<X<95)=",c)
cat("value of k1 such that P(X<k1) = 0.7 is ",k1)
cat("value of k2 such that P(X>k2) = 0.84 is",k2)
cat("name , roll no Q no.","Akshat Yadav & 16010122221 , Q5")
```

OUTPUT:

```
RStudio
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                                                                                                                                                                                                                           0.952209647727185
0.242677208918278
                                                                                                                                                                                                                            27.7258872223978
                                                                                                                                                                                                                           67.8660076906206
                                                                                                                                                                                     k2
                                                                                                                                                                                                                           74.9168682481463
                                                                                                                                                                                                                            0.025
                                                                                                                                                                    R Script ¢
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> a=pnorm(88,60,15)
  > a=pnorm(88,00,15)

> b=1-pnorm(35,60,15)

> c=pnorm(95,60,15)-pnorm(70,60,15)

> k1=qnorm(.7,60,15)

> k2=qnorm(.84,60,15)

> cat("P(X<88) =",a)
                                                                                                                                                                                   Zoom Zoom Export • Q | 
  > cat("P(X<88) =",a)
P(X<88) = 0.9690259 cat("P(X>35) =",b)
P(X>35) = 0.9522096 cat("P(T0×X>35) =",b)
P(X0×35) = 0.9522096 cat("P(T0×X>35) =",c)
P(T0×X>95) = 0.2426772 cat("value of k1 such that P(X×k1) = 0.7 is ",k1)
value of k1 such that P(X×k1) = 0.7 is 67.86601> cat("value of k2 such that P(X>k2) = 0.84 is ",k2)
value of k2 such that P(X>k2) = 0.84 is 74.91687> cat("name , roll no Q no.", "Akshat Vadav & 16010122
221 , 05")
name , roll no Q no. Akshat Vadav & 260202222
  name , roll no Q no. Akshat Yadav & 16010122221 , Q5
```