**Continuous Probability Distribution**

Name : Devansh Shah

Roll no: 1914078

Batch: B2

Uniform Distribution

1. If X is Uniform Distribution over the range (11,20). Write R-programme to evaluate and print (i) P(X<15.3) (ii)   P(X>13.4) (iii)  P(17.2< X<19.5)

CODE

a=punif(15.3,11,20)

b=punif(13.4,11,20)

c=punif(19.5,11,20)-punif(17.2,11,20)

cat("P(X<15.3)=",a)

cat("P(X>16.4)=",b)

cat("P(17.2<X<19.5)=",c)

OUTPUT

> a=punif(15.3,11,20)  
> b=punif(13.4,11,20)  
> c=punif(19.5,11,20)-punif(17.2,11,20)  
> cat("P(X<15.3)=",a)  
P(X<15.3)= 0.4777778> cat("P(X>16.4)=",b)  
P(X>16.4)= 0.2666667> cat("P(17.2<X<19.5)=",c)  
P(17.2<X<19.5)= 0.2555556

Exponential Distribution

2. If X is Exponential Distribution with mean 130. Write R-programme to evaluate and print (i) P(X<120) (ii)   P(X>75.4) (iii) P(105< X<135).

Find value of k such that P(X<k) = 0.8.

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CODE

 pa=1/130

a=pexp(120, pa)

b=1-pexp(75.4, pa)

c=pexp(135, pa)-pexp(105, pa)

k=qexp(.8, pa)

cat("P(X<120)=",a)  
cat("P(X>75.4)=",b)

cat("P(105< X<135).=",c)

cat("the value of k is ",k)

output

> pa=1/130  
> a=pexp(120, pa)  
> b=1-pexp(75.4, pa)  
> c=pexp(135, pa)-pexp(105, pa)  
> k=qexp(.8, pa)  
> cat("P(X<120)=",a)  
P(X<120)= 0.6027053> cat("P(X>75.4)=",b)  
P(X>75.4)= 0.5598984> cat("P(105< X<135).=",c)  
P(105< X<135).= 0.09188697> cat("the value of k is ",k)  
the value of k is 209.2269

Normal Distribution

3. If X is Normal Distribution with mean 520 and standard deviation 60. Write R-programme to evaluate and print (i) P(X<340) (ii)   P(X>600) (iii) P(400< X<550). Find value of k1 such that P(X<k1) = 0.8. Also find k2 such that P(X>k2) = 0.5

CODE

a=pnorm(340,520,60)

b=1-pnorm(600,520,60)

c=pnorm(550,520,60)-pnorm(400,520,60)

k1=qnorm(.8,520,60)

k2=qnorm(.5,520,60)

cat("P(X<340) =",a)

cat("P(X>600) =",b)

cat("P(400< X<550)=",c)

cat("value of k1 such that P(X<k1) = 0.8 is ",k1)

cat("value of k2 such that P(X>k2) = 0.5 is",k2)

output

a=pnorm(340,520,60)  
> b=1-pnorm(600,520,60)  
> c=pnorm(550,520,60)-pnorm(400,520,60)  
> k1=qnorm(.8,520,60)  
> k2=qnorm(.5,520,60)  
> cat("P(X<340) =",a)  
P(X<340) = 0.001349898> cat("P(X>600) =",b)  
P(X>600) = 0.09121122> cat("P(400< X<550)=",c)  
P(400< X<550)= 0.6687123> cat("value of k1 such that P(X<k1) = 0.8 is ",k1)  
value of k1 such that P(X<k1) = 0.8 is 570.4973> cat("value of k2 such that P(X>k2) = 0.5 is",k2)  
value of k2 such that P(X>k2) = 0.5 is 520