

**NAME:-** Hyder Presswala

**ROLL NO:-** 16010122151

**BATCH:-** B-2

**SY COMPS B**

**DATE:-** 06/03/2024

**Tutorial Number :-** 04

**Q.1** If  $X$  is Binomial Distribution  $B(n,p)$  where  $n=20$   $p=0.65$

Write R-program to evaluate and print (i)  $P(X=5)$  (ii)  $P(X \leq 16)$  (iii)  $P(X \geq 7)$

**Code:-**

```
a=dbinom(5,20,0.65)
```

```
b=pbinom(16,20,0.65)
```

```
c=1-pbinom(6,20,0.65)
```

```
cat("P(X=5)=",a)
```

```
cat("P(X≤16)=",b)
```

```
cat("P(X≥7)=",c)
```

```
cat("Name & Roll no", "Hyder Presswala -16010122151")
```

**Output:-**

```
Untitled1* x  Untitled2* x  Untitled3* x
Source on Save  Run  Source
1 a=dbinom(5,20,0.65)
2 b=pbinom(16,20,0.65)
3 c=1-pbinom(6,20,0.65)
4 cat("P(X=5)=",a)
5 cat("P(X≤16)=",b)
6 cat("P(X≥7)=",c)
7 cat("Name & Roll no", "Hyder Presswala -16010122151")
8
9
10

7:43 (Top Level) R Script
Console Terminal Background Jobs
R 4.3.2 · ~/
>
> a=dbinom(5,20,0.65)
> b=pbinom(16,20,0.65)
> c=1-pbinom(6,20,0.65)
> cat("P(X=5)=",a)
P(X=5)= 0.0002606341> cat("P(X≤16)=",b)
P(X≤16)= 0.9556244> cat("P(X≥7)=",c)
P(X≥7)= 0.9984793> cat("Name & Roll no", "Hyder Presswala -16010122151")
Name & Roll no Hyder Presswala -16010122151
> |
```

**Q.2** If  $X$  is Poisson Distribution with mean 0.05 Write R-program to evaluate and print (i)  $P(X=10)$  (ii)  $P(X \leq 5)$  (iii)  $P(12 \leq X \leq 25)$

**Code:-**

```
m=0.05
```

```
a=dpois(10,m)
```

```
b=ppois(5,m)
```

```
c=ppois(25,m)-ppois(11,m)
```

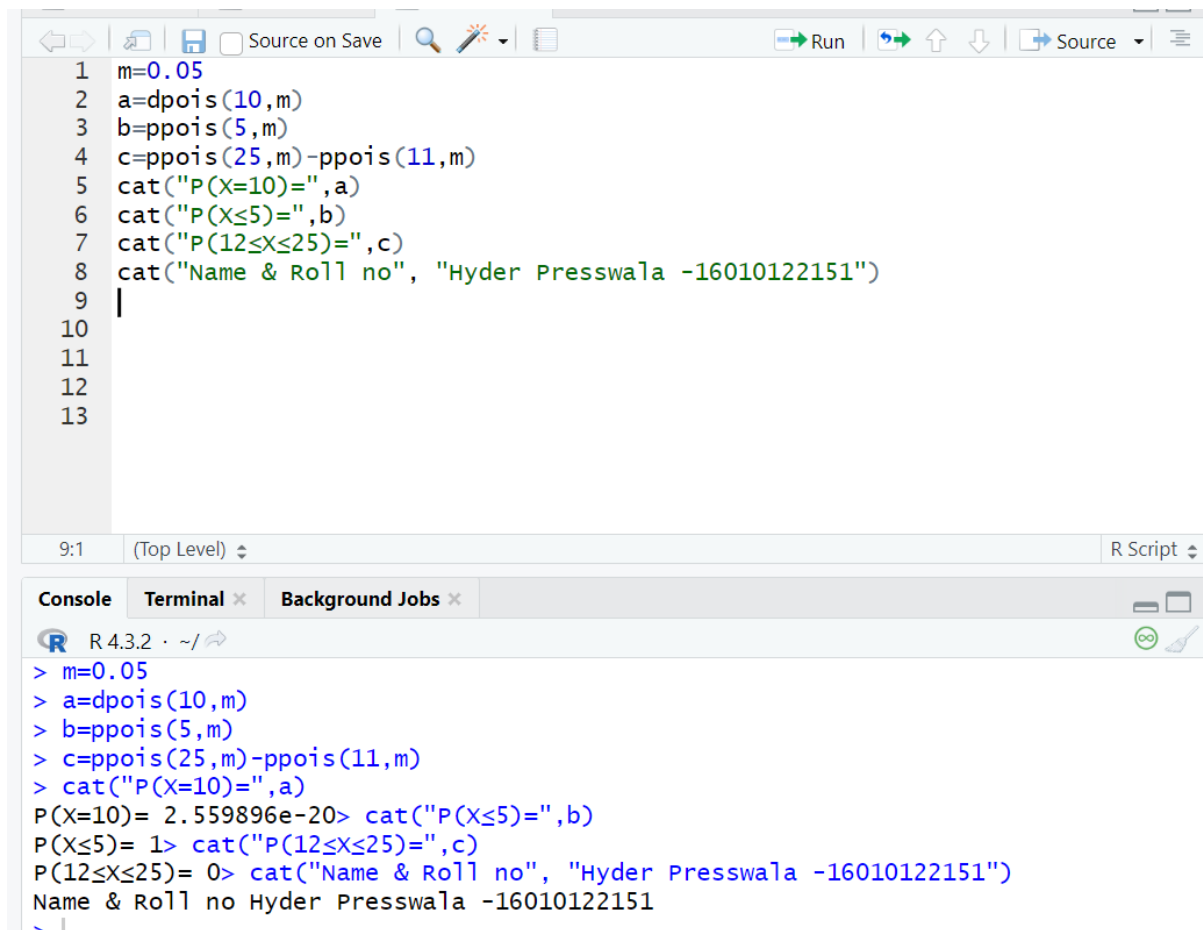
```
cat("P(X=10)=",a)
```

```
cat("P(X≤5)=",b)
```

```
cat("P(12≤X≤25)=",c)
```

```
cat("Name & Roll no", "Hyder Presswala -16010122151")
```

## Output:-



The screenshot displays the R Studio environment. The script editor at the top contains the following R code:

```
1 m=0.05
2 a=dpois(10,m)
3 b=ppois(5,m)
4 c=ppois(25,m)-ppois(11,m)
5 cat("P(X=10)=",a)
6 cat("P(X≤5)=",b)
7 cat("P(12≤X≤25)=",c)
8 cat("Name & Roll no", "Hyder Presswala -16010122151")
9 |
10
11
12
13
```

The console at the bottom shows the execution of this code:

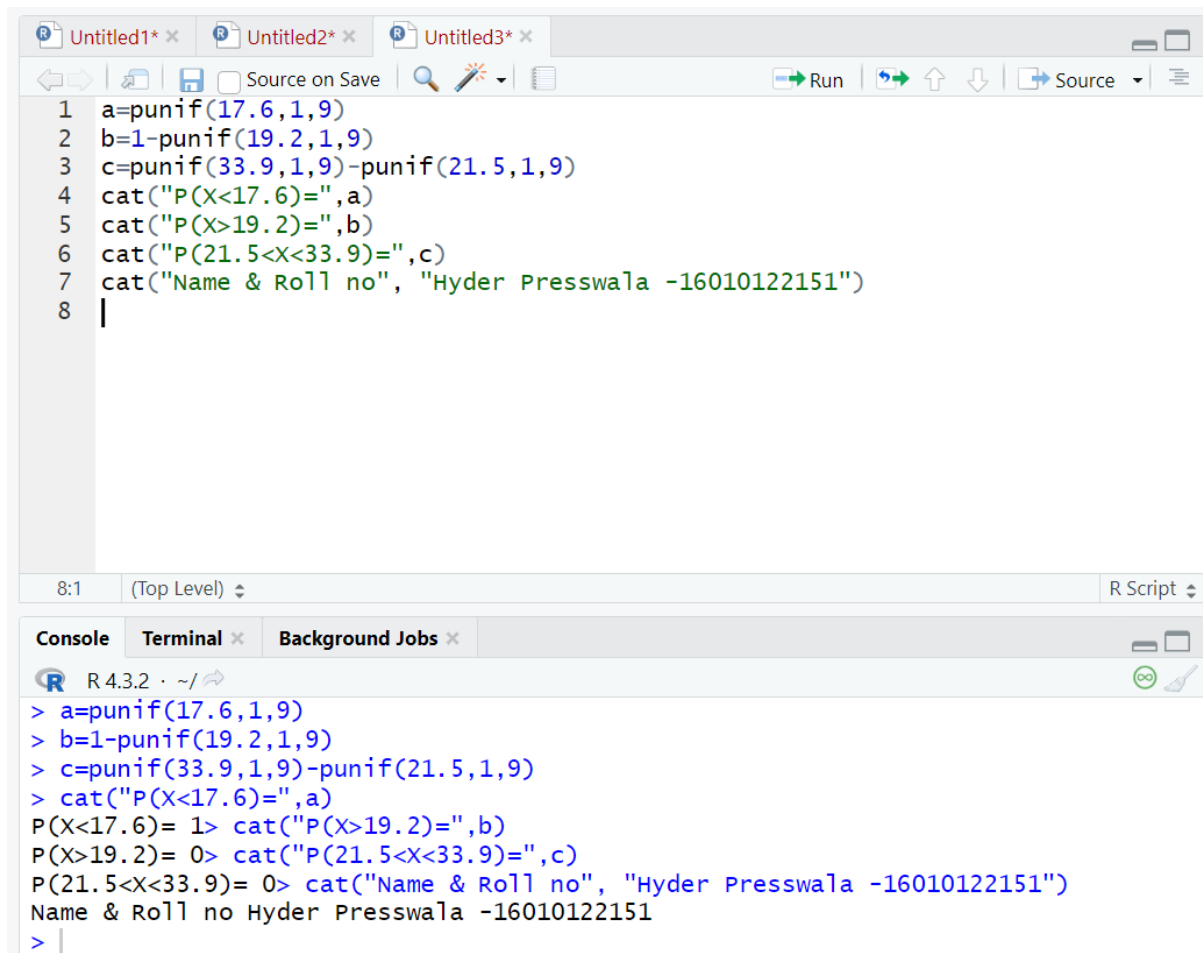
```
> m=0.05
> a=dpois(10,m)
> b=ppois(5,m)
> c=ppois(25,m)-ppois(11,m)
> cat("P(X=10)=",a)
P(X=10)= 2.559896e-20> cat("P(X≤5)=",b)
P(X≤5)= 1> cat("P(12≤X≤25)=",c)
P(12≤X≤25)= 0> cat("Name & Roll no", "Hyder Presswala -16010122151")
Name & Roll no Hyder Presswala -16010122151
> |
```

**Q.3** If  $X$  is Uniform Distribution over the range (1,35). Write R-program to evaluate and print (i)  $P(X < 17.6)$  (ii)  $P(X > 19.2)$  (iii)  $P(21.5 < X < 33.9)$

**Code:-**

```
a=punif(17.6,1,9)
b=1-punif(19.2,1,9)
c=punif(33.9,1,9)-punif(21.5,1,9)
cat("P(X<17.6)=",a)
cat("P(X>19.2)=",b)
cat("P(21.5<X<33.9)=",c)
cat("Name & Roll no", "Hyder Presswala -16010122151")
```

**Output:-**



```
1 a=punif(17.6,1,9)
2 b=1-punif(19.2,1,9)
3 c=punif(33.9,1,9)-punif(21.5,1,9)
4 cat("P(X<17.6)=",a)
5 cat("P(X>19.2)=",b)
6 cat("P(21.5<X<33.9)=",c)
7 cat("Name & Roll no", "Hyder Presswala -16010122151")
8 |
```

```
> a=punif(17.6,1,9)
> b=1-punif(19.2,1,9)
> c=punif(33.9,1,9)-punif(21.5,1,9)
> cat("P(X<17.6)=",a)
P(X<17.6)= 1> cat("P(X>19.2)=",b)
P(X>19.2)= 0> cat("P(21.5<X<33.9)=",c)
P(21.5<X<33.9)= 0> cat("Name & Roll no", "Hyder Presswala -16010122151")
Name & Roll no Hyder Presswala -16010122151
> |
```

**Q.4** If X is Exponential Distribution with mean 60. Write R-program to evaluate and print

(i)  $P(X < 45)$  (ii)  $P(X > 50)$  (iii)  $P(5 < X < 75)$ .

**Find value of k such that  $P(X < k) = 0.7$**

**Code:-**

```
pa=1/60
a=pexp(45, pa)
b=1-pexp(50, pa)
c=pexp(75, pa)-pexp(5, pa)
k=qexp(.7, pa)
cat("P(X<45)=",a)
cat("P(X>50)=",b)
cat("P(5< X<75).=",c)
cat("The value of k is ",k)
cat("Name & Roll no", "Hyder Presswala -16010122151")
```

**Output:-**

```
Untitled1* x  Untitled2* x  Untitled3* x
Source on Save  Run  Source
1 pa=1/60
2 a=pexp(45, pa)
3 b=1-pexp(50, pa)
4 c=pexp(75, pa)-pexp(5, pa)
5 k=qexp(.7, pa)
6 cat("P(X<45)=",a)
7 cat("P(X>50)=",b)
8 cat("P(5< X<75).=",c)
9 cat("The value of k is ",k)
10 cat("Name & Roll no", "Hyder Presswala -16010122151")
11
12
13
6:18 (Top Level) R Script
Console Terminal Background Jobs
R 4.3.2 ~ /
> pa=1/60
> a=pexp(45, pa)
> b=1-pexp(50, pa)
> c=pexp(75, pa)-pexp(5, pa)
> k=qexp(.7, pa)
> cat("P(X<45)=",a)
P(X<45)= 0.5276334> cat("P(X>50)=",b)
P(X>50)= 0.4345982> cat("P(5< X<75).=",c)
P(5< X<75).= 0.6335396> cat("The value of k is ",k)
The value of k is 72.23837> cat("Name & Roll no", "Hyder Presswala -16010122151")
Name & Roll no Hyder Presswala -16010122151
```

**Q.5** If X is Normal Distribution with mean 20 and standard deviation 5. Write R-program to evaluate and print (i)  $P(X < 28)$  (ii)  $P(X > 15)$  (iii)  $P(10 < X < 35)$ .

Find value of  $k_1$  such that  $P(X < k_1) = 0.3$ . Also find  $k_2$  such that  $P(X > k_2) = 0.04$

### Code:-

```
a=pnorm(28,20,5)
b=1-pnorm(15,20,5)
c=pnorm(35,20,5)-pnorm(10,20,5)
k1=qnorm(.3,20,5)
k2=qnorm(.04,20,5)
cat("P(X<28) =",a)
cat("P(X>15) =",b)
cat("P(10< X<35)=",c)
cat("value of k1 such that P(X<k1) = 0.3 is ",k1)
```

```
cat("value of k2 such that  $P(X > k2) = 0.04$  is", k2)
```

```
cat("Name & Roll no", "Hyder Presswala -16010122151")
```

## Output:-

```
1 a=pnorm(28,20,5)
2 b=1-pnorm(15,20,5)
3 c=pnorm(35,20,5)-pnorm(10,20,5)
4 k1=qnorm(.3,20,5)
5 k2=qnorm(.04,20,5)
6 cat("P(X<28) =",a)
7 cat("P(X>15) =",b)
8 cat("P(10< X<35)=",c)
9 cat("value of k1 such that P(X<k1) = 0.3 is ",k1)
10 cat("value of k2 such that P(X>k2) = 0.04 is",k2)
11 cat("Name & Roll no", "Hyder Presswala -16010122151")
12
13
14
15
16
```

14:1 (Top Level) R Script

Console Terminal Background Jobs

```
R 4.3.2 ~/  
> k1=qnorm(.3,20,5)  
> k2=qnorm(.04,20,5)  
> cat("P(X<28) =",a)  
P(X<28) = 0.9452007> cat("P(X>15) =",b)  
P(X>15) = 0.8413447> cat("P(10< X<35)=",c)  
P(10< X<35)= 0.9759> cat("value of k1 such that P(X<k1) = 0.3 is ",k1)  
value of k1 such that P(X<k1) = 0.3 is 17.378> cat("value of k2 such that P(X>  
k2) = 0.04 is",k2)  
value of k2 such that P(X>k2) = 0.04 is 11.24657> cat("Name & Roll no", "Hyder  
Presswala -16010122151")  
Name & Roll no Hyder Presswala -16010122151
```