Date 29.2.24

Expt. No. 4.

Page No.

PRACTICAL - 4

AIM : To find the Binomial Distribution of given n and p is not given.

SOFTWARE USED : Scilab

SOURCE CODE :

```
clc
clear all
disp("enter no of observation")
n=input('\')
disp("enter the vlaue of x")
for i=1:n
   X(1,i)=input('\')
end
disp("enter no of frequency")
for j=1:n
   F(1,j)=input('\')
end
disp("Mean of the distribution is")
MEA=sum(F.*X)/sum(F)
disp(MEA)
p=MEA/n
EF=sum(F)*binomial(p,n-1)
disp("Given frequencies")
disp(F)
disp("Expected frequencies")
disp(EF)
plot2d3(0:n-1, F)
plot2d(0:n-1,EF)
```

Teacher's Signature

THEORY :

Here's an example to show how to fit a Binomial Distribution when p is not given,

x	f	$f.x$
0	36	0
1	40	40
2	22	44
3	2	6
	$\Sigma f = 100 = N$	$\Sigma f.x = 90$

Here, $n = 3$

Mean, $\frac{\Sigma f(x)}{\Sigma f} = \frac{90}{100} = 0.9$

P & q → np = mean

$3.(p) = 0.9 \Rightarrow p = 0.3$

$q = 1 - p = 0.7$

Now,

$P(X=x) = {}^nC_x p^x q^{n-x}$

$\therefore P(X=0) = {}^3C_0 (0.3)^0 (0.7)^3 = 0.342$

$P(X=1) = {}^3C_1 (0.3)^1 (0.7)^2 = 0.441$

$P(X=2) = {}^3C_2 (0.3)^2 (0.7)^1 = 0.189$

$P(X=3) = {}^3C_3 (0.3)^3 (0.7)^0 = 0.027$

Binomial Distribution

x	$P(x)$	$N.P(x)$	E_i (Expected Freq.)	O_i (Obs Freq.)
0	0.342	34.2	34	36
1	0.441	44.1	44	40
2	0.189	18.9	19	22
3	0.027	2.7	3	2
			$\Sigma f = N = 100$	$\Sigma f = 100$

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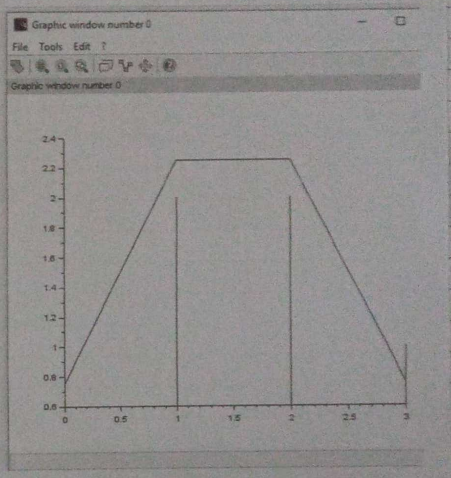
OUTPUT :

```
"enter no of observation"
 \4
 "enter the value of x"
 \2
 \1
 \3
 \2
 "enter no of frequency"
 \1
 \2
 \2
 \1
 "Mean of the distribution is"
  2.
 "Given frequencies"
  1.  2.  2.  1.
 "Expected frequencies"
  0.75  2.25  2.25  0.75
```



THEORY :

→ To fit a Binomial Distribution when p is given,

$p = 0.4140$

$q = 1 - p = 0.586$

x	f
0	15
1	22
2	6
3	12
4	9

Now,

$P(X = x) = {}^{n}C_{x}\, p^{x} q^{n-x}$

→ $P(0) = {}^{4}C_{0}(0.414)^{0}(0.586)^{4} = 0.1179$

→ $P(1) = {}^{4}C_{1}(0.414)^{1}(0.586)^{3} = 0.332$

→ $P(2) = {}^{4}C_{2}(0.414)^{2}(0.586)^{2} = 0.3531$

→ $P(3) = {}^{4}C_{3}(0.414)^{3}(0.586)^{1} = 0.0689$

→ $P(4) = {}^{4}C_{4}(0.414)^{4}(0.586)^{0} = 3.4641$

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Expt. No. 5.

Page No.

PRACTICAL - 5

AIM : To fit a Binomial distribution on a set of observation when P is given.

SOFTWARE USED : SciLab

SOURCE CODE :

```
clc
clear all
n=4
disp("no of observations", n)
x=input("enter values of x")
disp(x)

y=input("enter observed frequencies")
disp(y)
p=0.4140625
EF=sum(y)*binomial(p,n)
disp("expected frequencies",EF)
disp("sum of expected frequencies", sum(EF))
```

Teacher's Signature

BINOMIAL DISTRIBUTION :

x	$P(x)$	$N.P(x)$	E_i (Expected Freq.)	O_i (Observed Freq.)
0	0.1179	7.5439	7	15
1	0.3332	21.3235	21	22
2	0.3531	22.6039	22	6
3	0.0689	10.6435	10	12
4	3.4641	1.8812	1	9

Date

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OUTPUT :

```
"no of observations"

  4.
enter values of x[0,1,2,3,4]


  0.   1.   2.   3.   4.
enter observed frequencies[15,22,6,12,9]


  15.   22.   6.   12.   9.

"expected frequencies"

  7.5437129   21.323562   22.602975   10.648513   1.8812373

"sum of expected frequencies"

  64.
```

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Teacher's Signature

Date 14.3.24

Expt. No. 6. Page No.

PRACTICAL -6

AIM: Fitting of possion distribution after given value of λ.

SOFTWARE USED: SciLab

SOURCE CODE:

```
clc
n=input("Enter Value of n:");
l=input("Enter Value of l:");
X=[0,1,2,3,4];
for idx = 1:5
    frequency(idx) = input("enter frequency:");
end
N = 200;
disp("Expected Frequencies are:");
for idx = 1:5
    ans(idx)=(exp(-l)*(l**X(idx)))/factorial(X(idx));
    ans(idx) = N*ans(idx);
end
disp(ans);
sef = sum(ans);
disp("sum of expected frequencies are:");
disp(sef);
sof = sum(frequency);
disp("sum of observed frequencies are:");
disp(sof);
```

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OUTPUT :

```
Enter Value of n:4

Enter Value of l:  0.5

enter frequency:122

enter frequency:60

enter frequency:15

enter frequency:2

enter frequency:1


  "Expected Frequencies are:"

   73.575888
   73.575888
   36.787944
   12.262648
   3.0656620

  "sum of expected frequencies are:"

   199.26803

  "sum of observed frequencies are:"

   200.
```

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Expt. No. 7.

Page No.

PRACTICAL - 7

AIM: Fitting of Possion Distribution after computing mean.

SOFTWARE USED: SciLab

SOURCE CODE:

```
clc
n=input("Enter Value of n:");
disp("values of x:");
for i=1:5
    x(i) = input("");
end
disp("values of f");
for i=1:5
    f(i)=input("");
end
for i=1:5
    fx(i)=f(i)*x(i);
end
sf = 0;
sfx = 0;
for i=1:5
    sf = sf+f(i);
    sfx = sfx+fx(i);
end
mean = sfx/sf;
I = mean/n
N = 200;
disp("Expected Frequencies are:");
for idx = 1:5
    ans(idx)=(exp(-1)*(1**X(idx)))/factorial(X(idx));
    ans(idx) = N*ans(idx);
end
disp(ans);
sef = sum(ans);
disp("sum of expected frequencies are:");
disp(sef);
sof = sum(frequency);
disp("sum of observed frequencies are:");
disp(sof);
```

Teacher's Signature

OUTPUT :

```
Enter Value of n:4

 "values of x:"
-> 0

-> 1

-> 2

-> 3

-> 4

 "values of f"
-> 122

-> 60

-> 15

-> 2

-> 1

"Expected Frequencies are:"

73.575888
73.575888
36.787944
12.262648
3.0656620

"sum of expected frequencies are:"

199.26803

"sum of observed frequencies are:"

200.
```