Report

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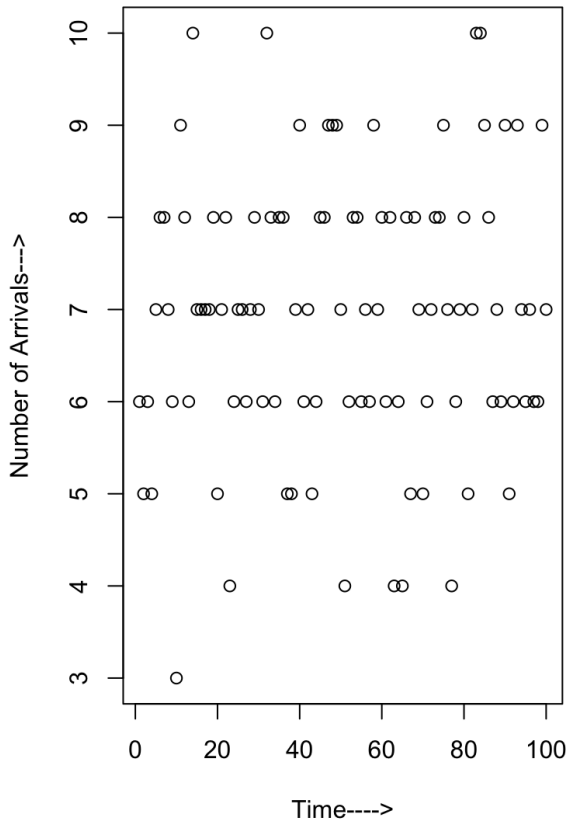
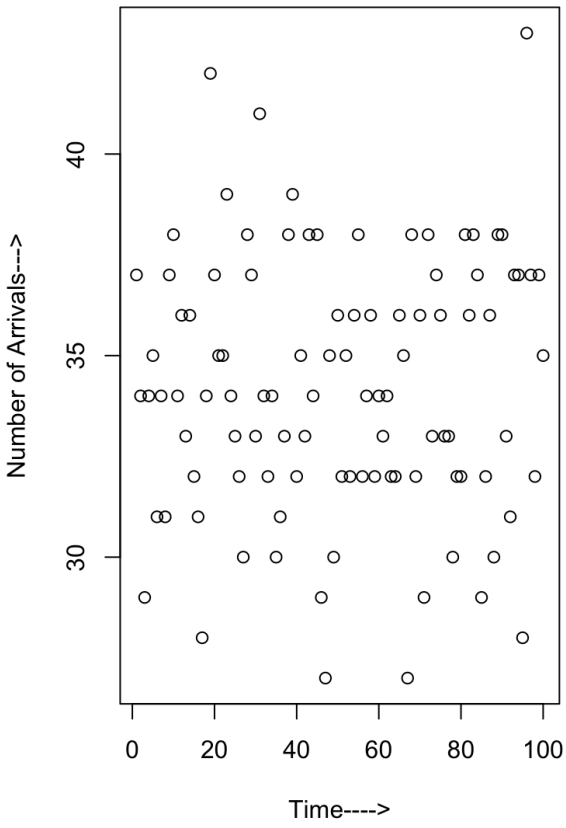
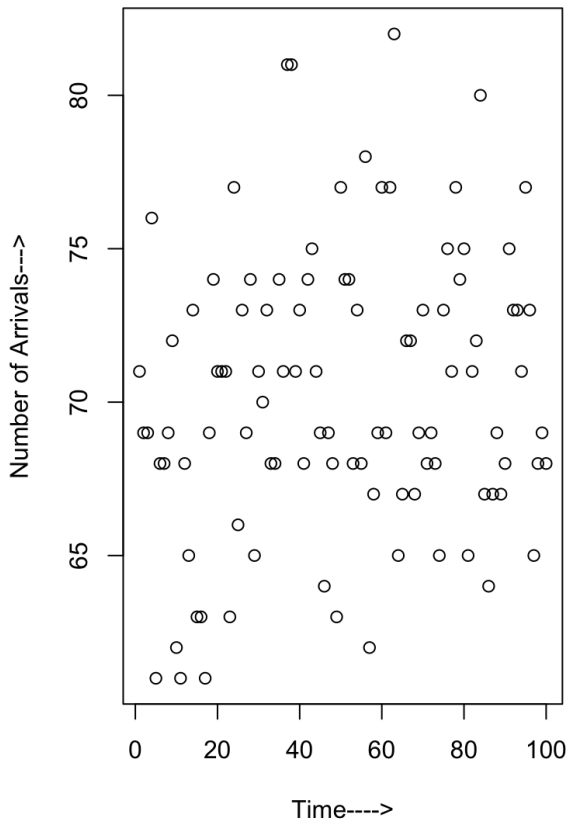
Roll Number : 2019227

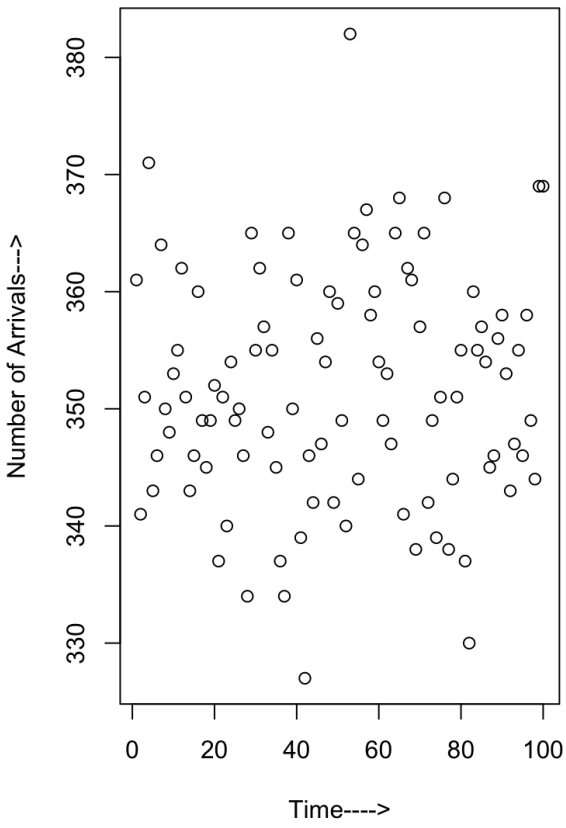
Question 1 :

A.









Number of arrivals for each t is as follows, where I have neatly printed the values within the program itself. As well as the expectation values.

> print(numberOfArrivals)
[[1]]
[1] 693

[[2]]
[1] 3419

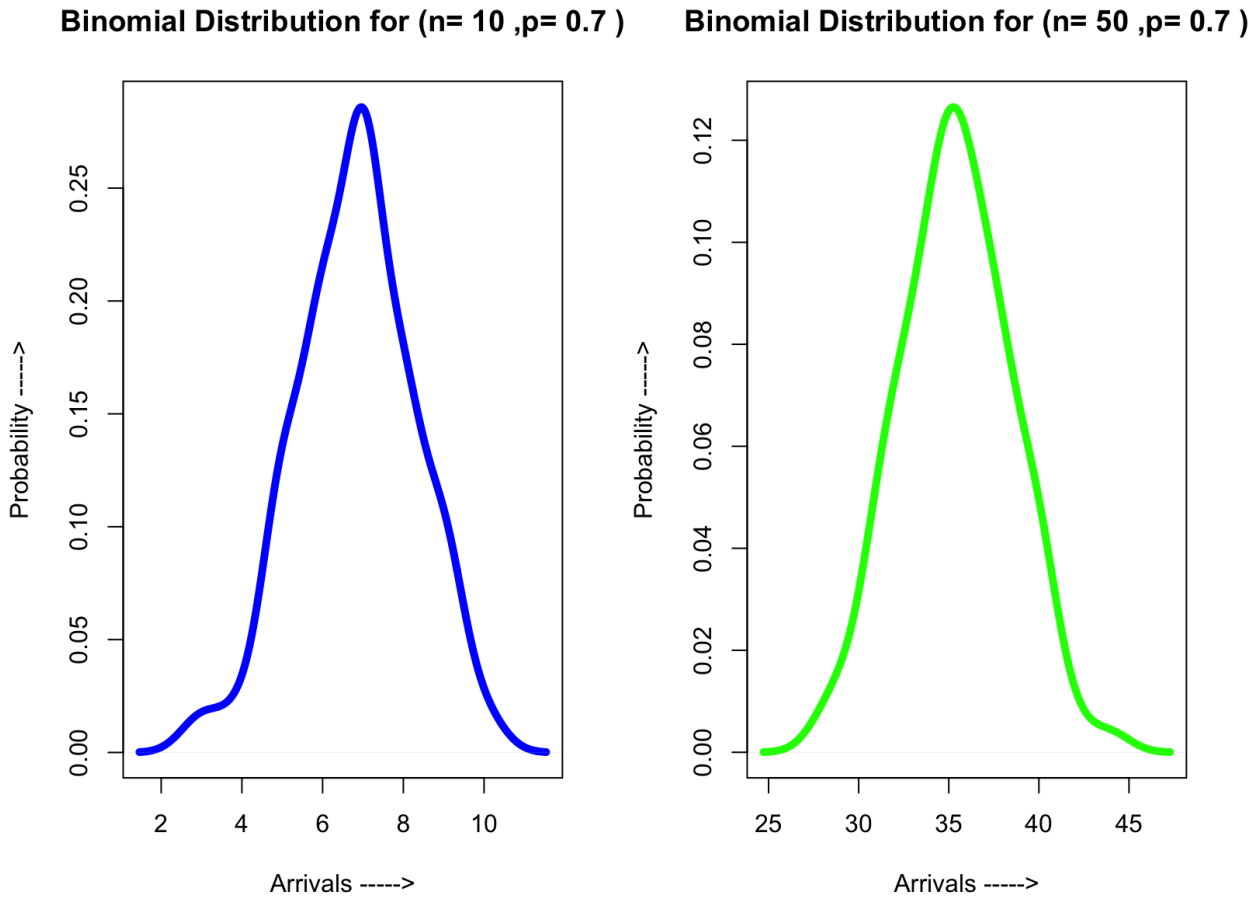
[[3]]
[1] 7021

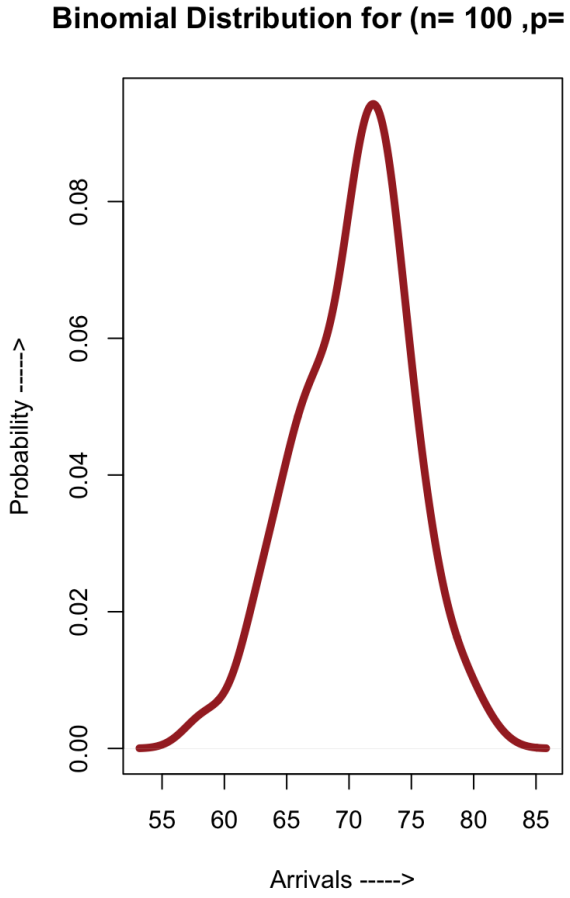
[[4]]
[1] 35164

> print(expectationValues)

[1] 69.300 68.380 70.210 70.328

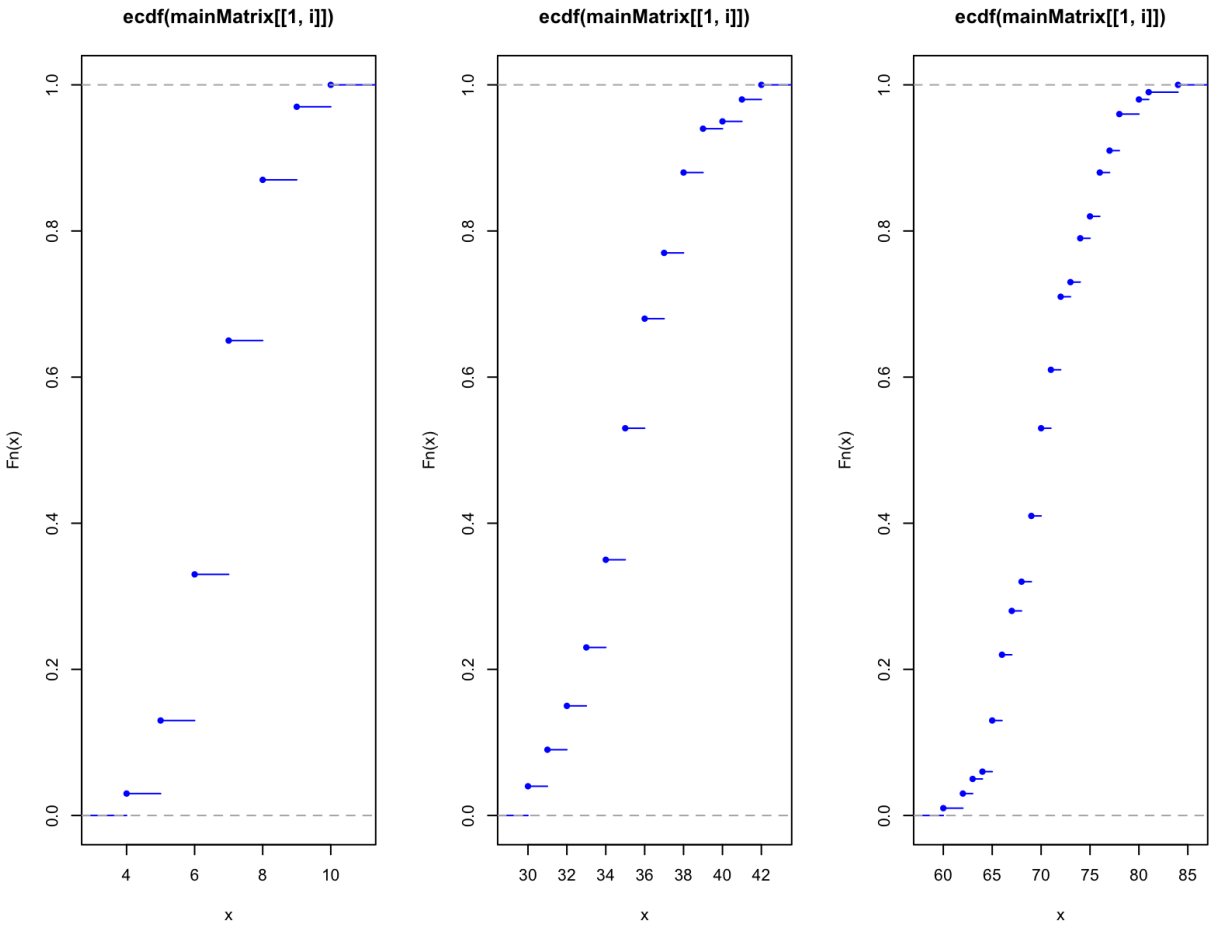
B.

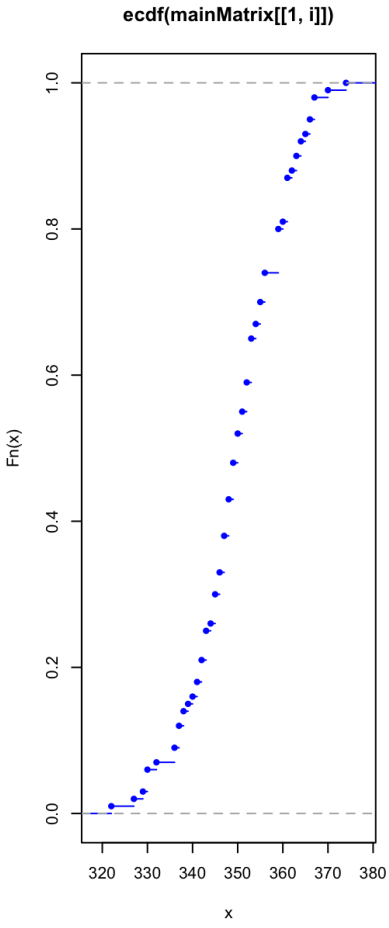




For this, the graph of the binomial distribution depends on the number of trials and probability (n * p) . We get max probability at the expectation value, in this case (t * p) .

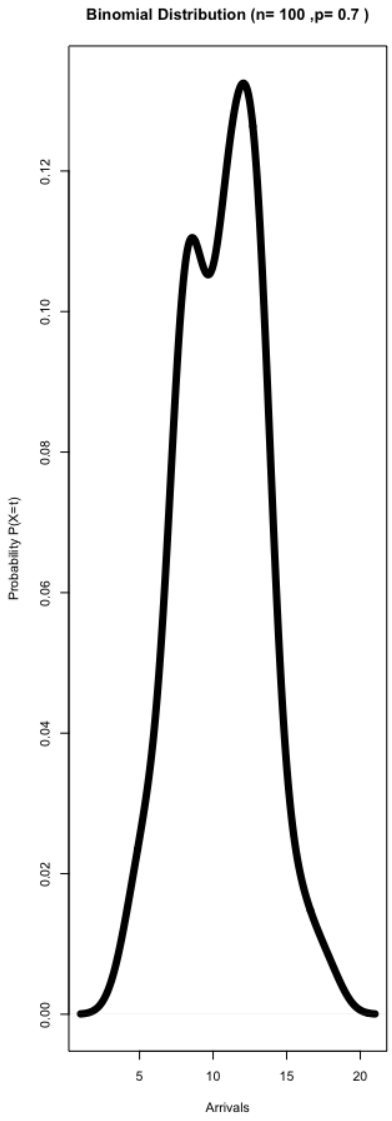
C.


ecdf(mainMatrix[[1, i]])
Fn(x)
x
0.0
0.2
0.4
0.6
0.8
1.0
4
6
8
10
ecdf(mainMatrix[[1, i]])
Fn(x)
x
30
32
34
36
38
40
42
ecdf(mainMatrix[[1, i]])
Fn(x)
x
60
65
70
75
80
85

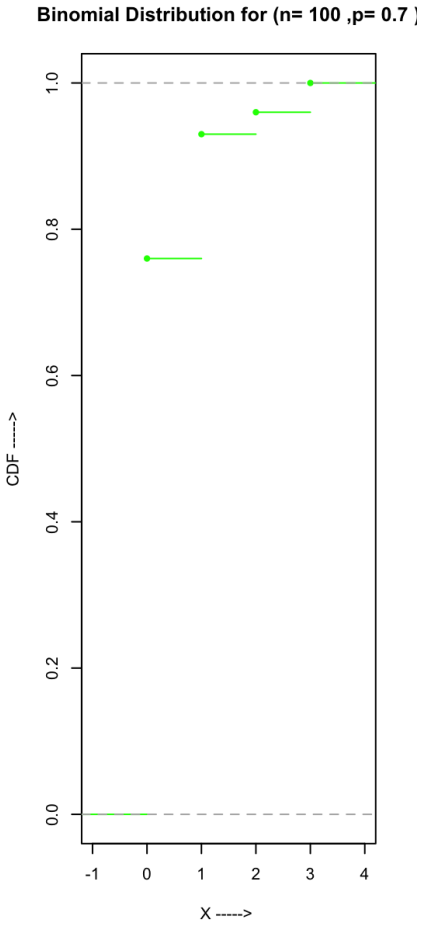


The cdf graph is increasing in each of the cases for t = 10,50,100,500. The cdf is max at the expectation value when t*p.

D.

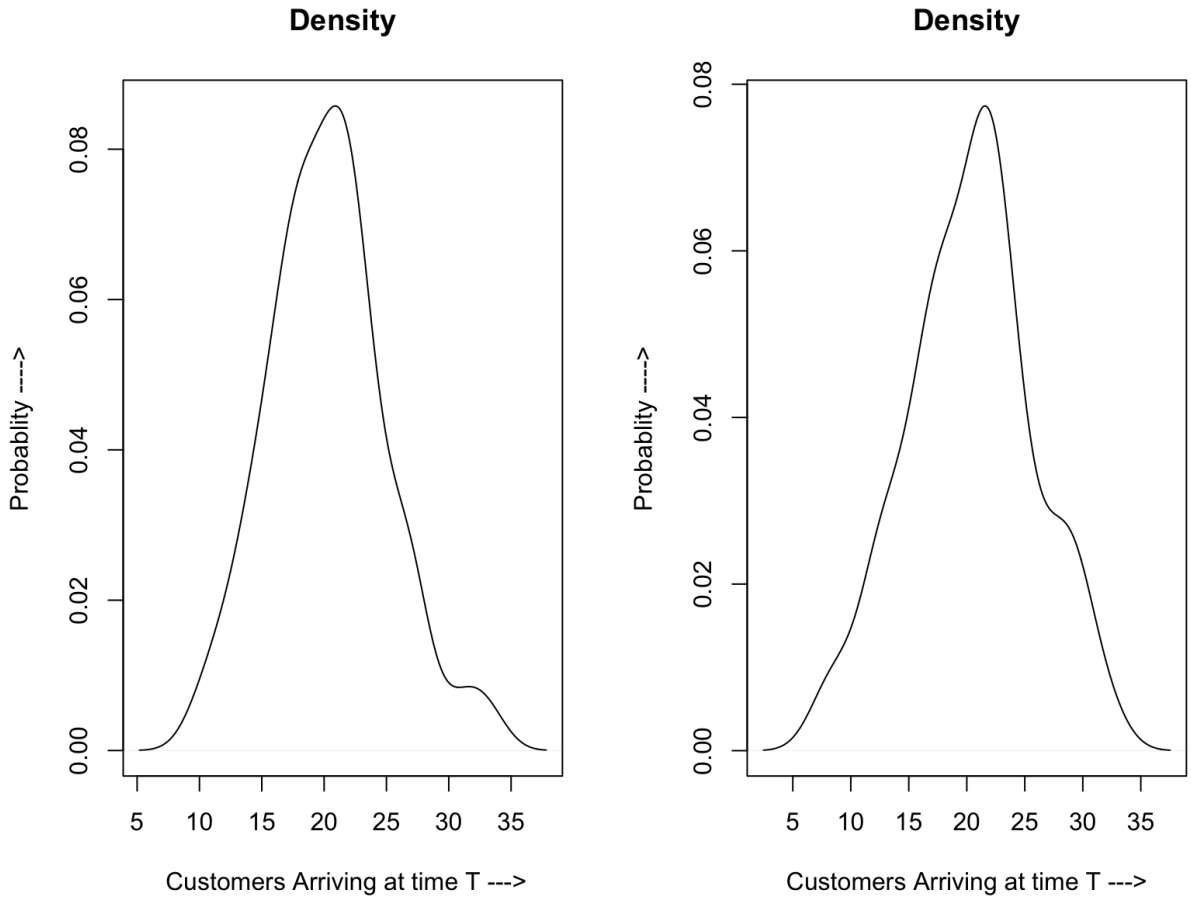

Binomial Distribution (n= 100 ,p= 0.7)
Probability P(X=t)
0.00
0.02
0.04
0.06
0.08
0.10
0.12
5
10
15
20
Arrivals

E.

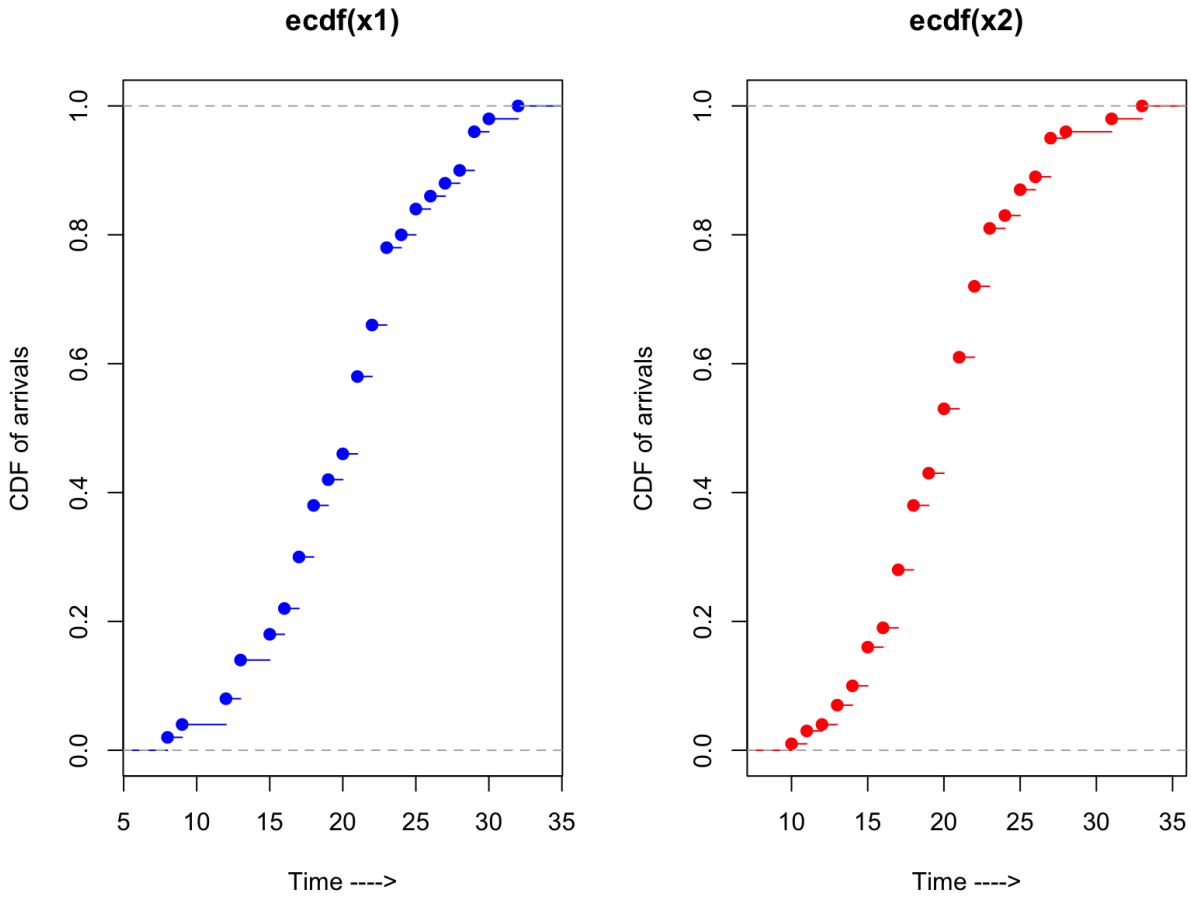


Question 2.

A.


Density
Probablity --->
0.00
0.02
0.04
0.06
0.08
5
10
15
20
25
30
35
Customers Arriving at time T --->
Density
Probablity --->
0.00
0.02
0.04
0.06
0.08
5
10
15
20
25
30
35
Customers Arriving at time T --->

B.


ecdf(x1)
CDF of arrivals
0.0
0.2
0.4
0.6
0.8
1.0
5
10
15
20
25
30
35
Time ---->
ecdf(x2)
CDF of arrivals
0.0
0.2
0.4
0.6
0.8
1.0
10
15
20
25
30
35
Time ---->