Questions.

Q1A)

what is the five-number summary of the data.

```
> roulette
  [1] 25  9  5  5  5  9  6  5 15 45 55  6  5  6 24 21 16  5  8  7  7  5
 [23]  5 35 13  9  5 18  6 10 19 16 21  8 13  5  9 10 10  6 23  8  5 10
 [45] 15  7  5  5 24  9 11 34 12 11 17 11 16  5 15  5 12  6  5  5  7  6
 [67] 17 20  7  8  8  6 10 11  6  7  5 12 11 18  6 21  6  5 24  7 16 21
 [89] 23 15 11  8  6  8 14 11  6  9  6 10
> fivenum(roulette)
[1]  5  6  9 15 55
> ##five num summary displays five num summaray
> ##or we can use summary like the pdf request
> summary(roulette)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    5.0     6.0     9.0    11.8    15.0    55.0
```

The minimum capital before the players loses is the buy in 5 dollars.

The maximum capital before losing their five dollars is 55 which would be 50 successful one-dollar bets.

The lower range of money before losing is 6 dollars which is one successful bet.

The outer range is 15 dollars which is 10 successful bets.

The median of the range is 9 which is four successful one-dollar bets.

Q1B)

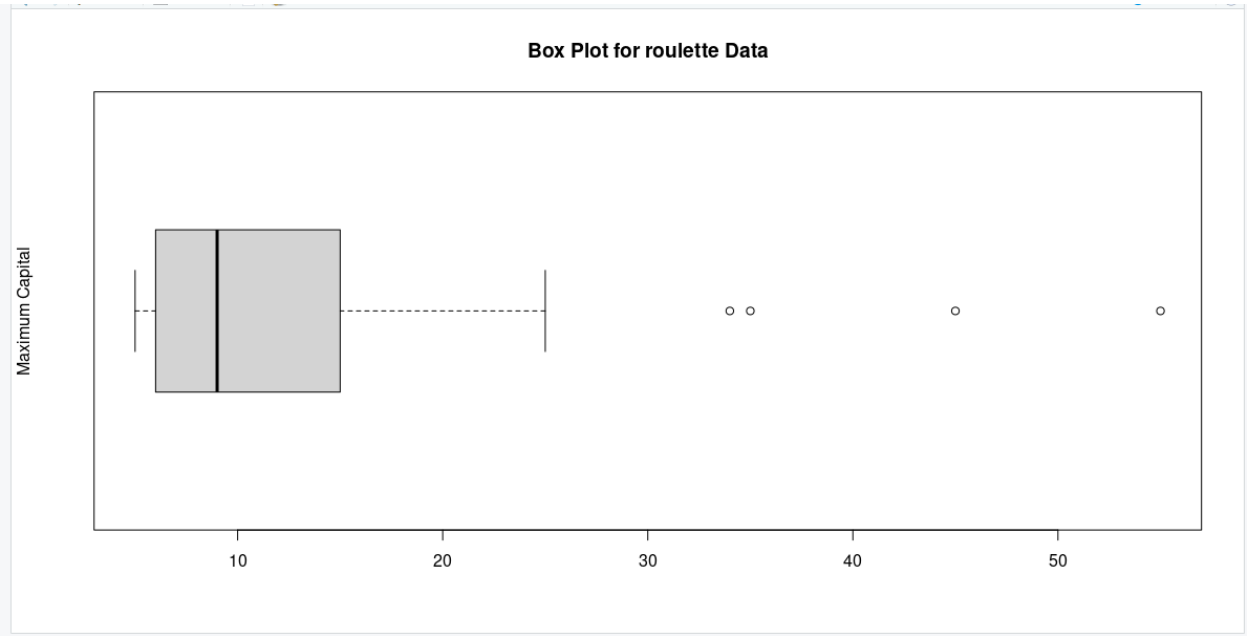
Calculate the IQR and the locations of the inner and outer fences to identify outliers & extreme outliers. Submit the R output for the IQR, inner & outer fences. Then clearly explain if there are any outliers and extreme outliers based on the values of the output

```
> ##calculating the IQR range
> ##inner fences of the IQR
> summary(roulette)[2]-1.5*IQR(roulette)
1st Qu.
   -7.5
> summary(roulette)[5]+1.5*IQR(roulette)
3rd Qu.
   28.5
> #outer fences of the IQR
> summary(roulette)[2]-3*IQR(roulette)
1st Qu.
    -21
> summary(roulette)[5]+3*IQR(roulette)
3rd Qu.
     42
```

Any outliers of the IQR are numbers where people made more than 42 dollars, or 35 successful one-dollar belts.

Q1C)

draw a box plot that shows the fences, suspected outliers, and outliers. (Must draw using R
only.)



Q2A) Find the frequencies 0, 1, 2,...,8.

```
> #start of question 2
> Delta = read.table("gamma.txt", header=F)
> gamma = Delta$V1
> ##calculating the question of 0, 1 , 2, ..8
> table(gamma)
gamma
 0  1  2  3  4  5  6  7  8
17 47 63 63 49 28 21 11  1
```

Q2B)

calcuate the sample mean and sample variance. Are they approximately equal to each other

```
> #calculate the sample mean and sample variance
> mean(gamma)
[1] 3.03
> var(gamma)
[1] 3.193077
```

Sample mean = 3.03,

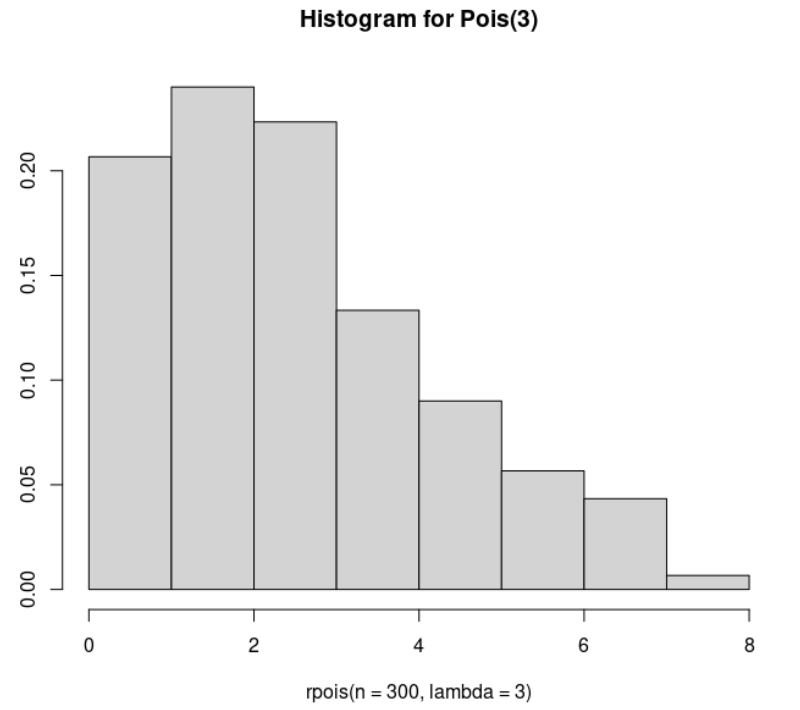
Sample Variablity = 3.193

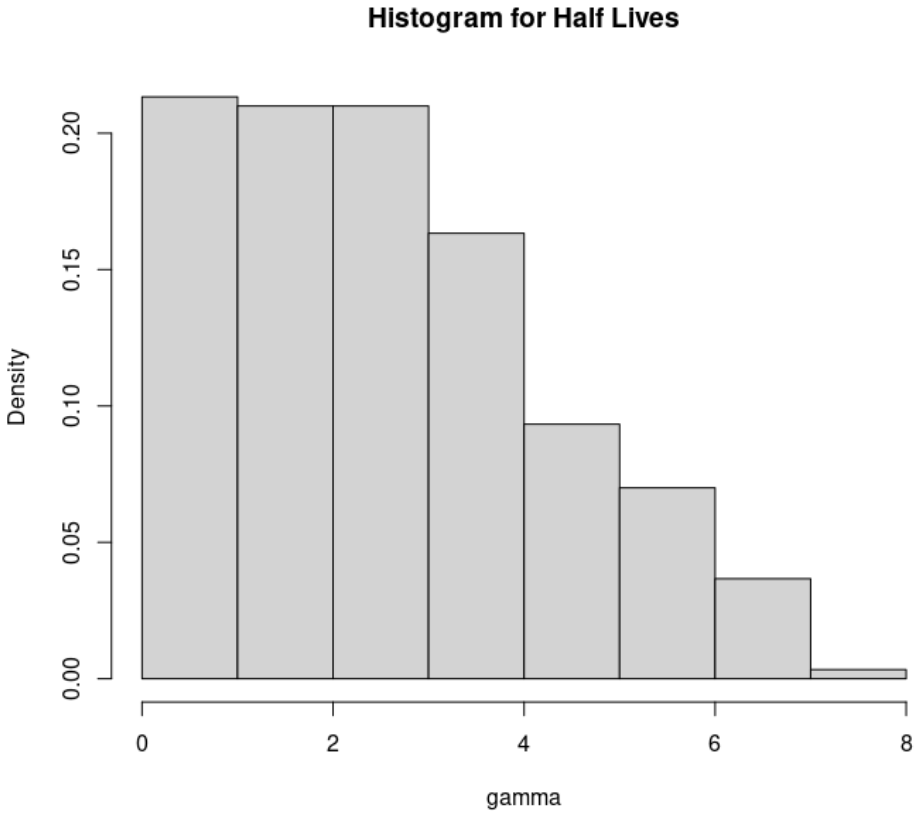
They are similar but I would not say they are equal, when being compared to lambda 3 we can see a trend but the variablity is a pretty significant margin of error different than the mean.

Q3B)

Construct a probability histogram with $\lambda = 3$ and a relative frequency histogram on the same
graph. Graph must be drawn using R only.

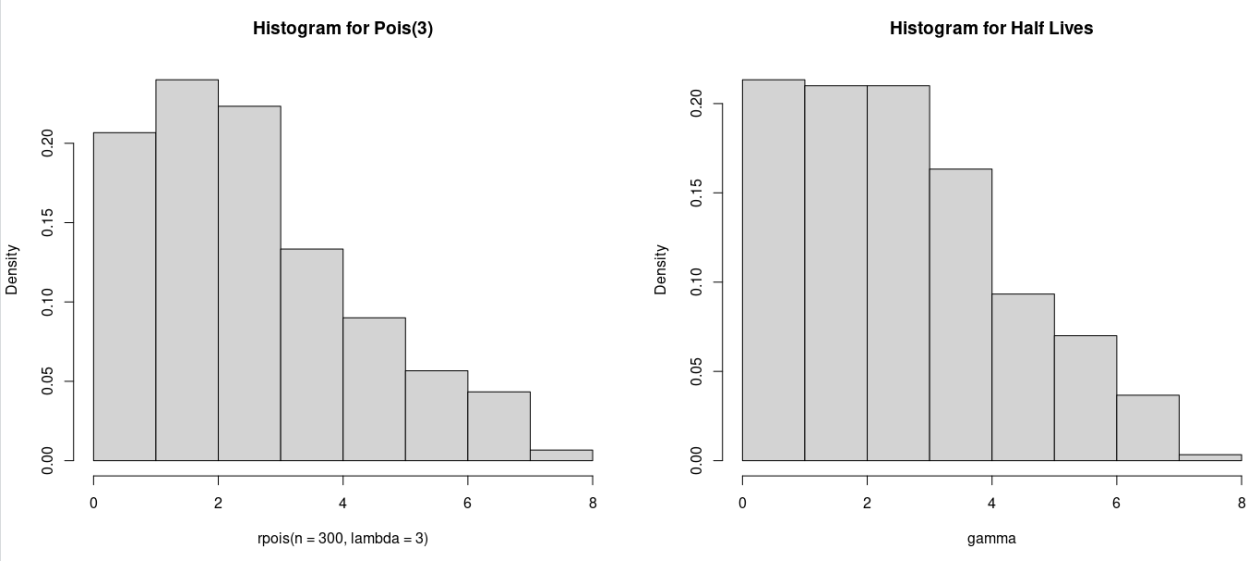
Probablity Histogram:





Relative Frequency:

Q4B) What is your conclusion?



I think these are not similar, while they both follow a general half-life distribution Pois have an increase to decline while half-life's start at a steady start and incrementally fall.