

# QUADRAT ANALYSIS

計量地理學及實習 2018.11.16 杜承軒

一個區間內發生的次數是 $\lambda$   
e.g. 一週會賣出2件

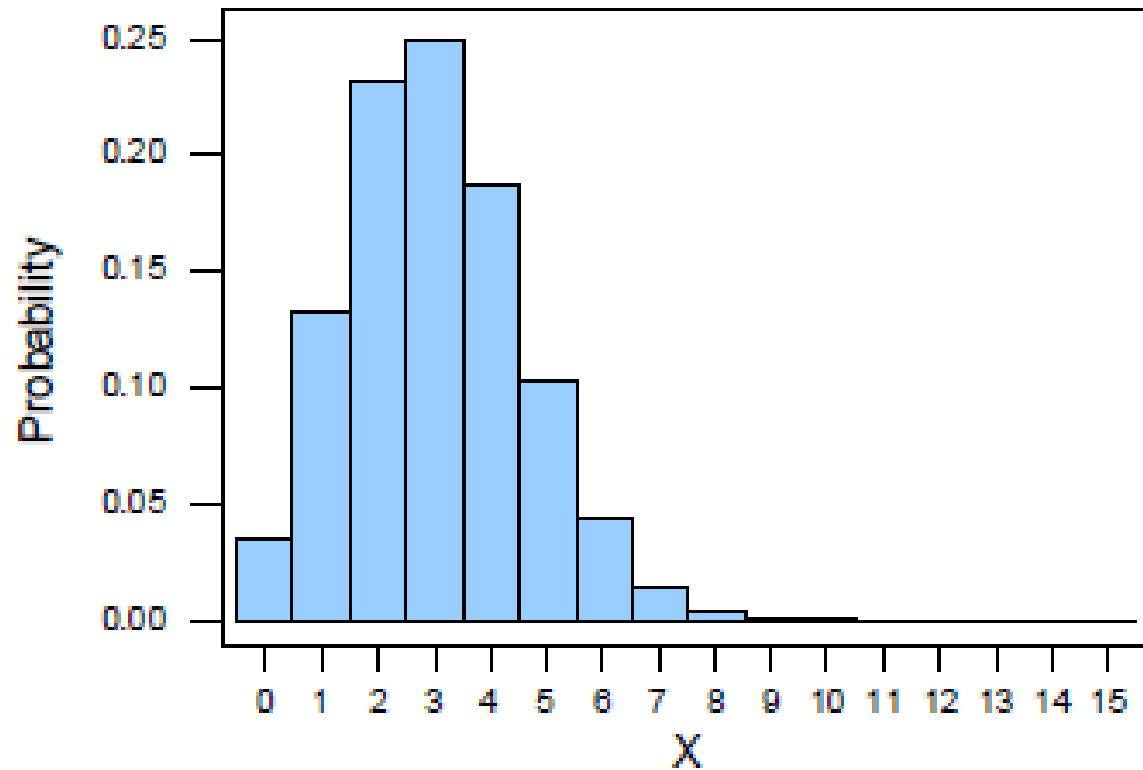
二項分配：一天 $p=2/7$   
30天,  $n=30$ ,  $p=2/7$

Poisson分配：30天平均 $=60/7$   
 $\lambda=60/7$

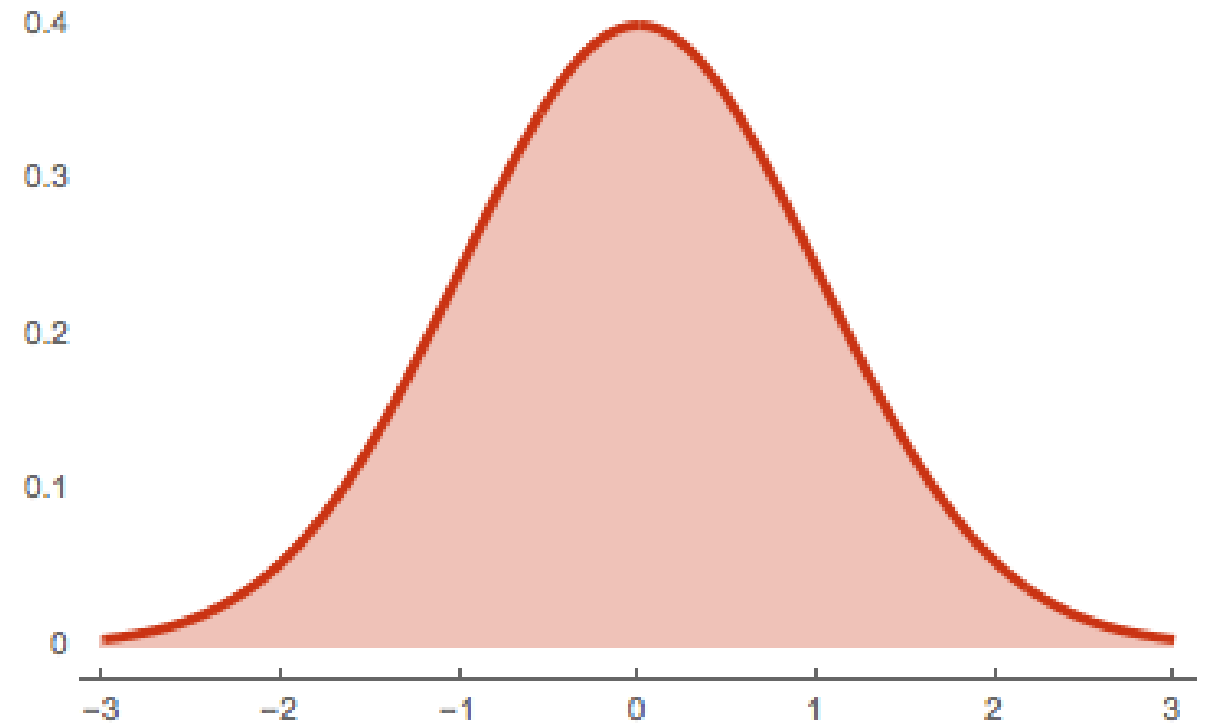
# 概念複習：pmf & pdf

Discrete  
e.g. Binomial

Binomial distribution with  $n = 15$  and  $p = 0.2$



Continuous  
e.g. Normal



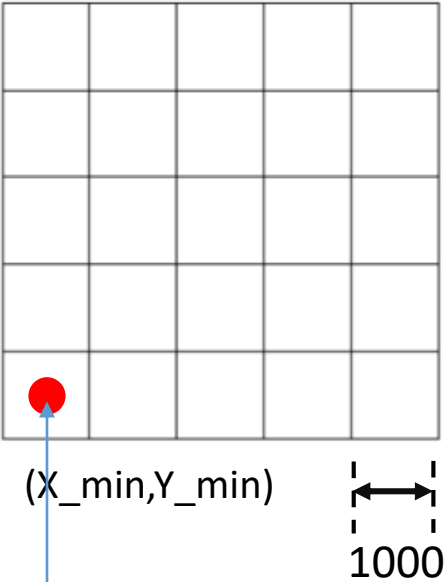
# Quadrat Analysis

- Step 1: fishnet: `GridTopology()`
- ~~Step 2: spatial intersection: `gIntersection()`~~
- Step 3: calculate counts of points in each grid: `poly.count()`
- Step 4: calculate mean and variance of counts: `mean()`, `var()`
- Step 5: hypothesis testing (Variance-Mean Ratio Test): `t test`
- Step 6: make a conclusion

# 概念複習：Fishnet

- GridTopology(cellcentre.offset, cellsize, cells.dim)

$c(bb[1,1],bb[2,1]), c(1000,1000), c(5,5)$



# 概念複習：Fishnet

- GridTopology(cellcentre.offset, cellsize, cells.dim)

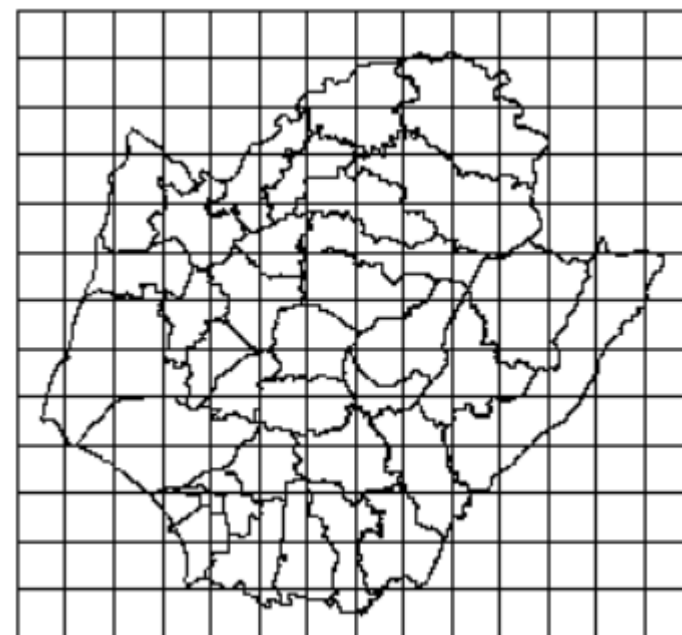
```
XM=TN@bbox[1,2];Xm=TN@bbox[1,1]  
YM=TN@bbox[2,2];Ym=TN@bbox[2,1]  
pix=5000  
m=round((XM-Xm)/pix)+1  
n= round((YM-Ym)/pix)+1  
GridTopology(c(Xm,Ym),c(pix,pix),c(m,n))
```

c(bb[1,1],bb[2,1]), c(1000,1000), c(5,5)



Assume N pixels,

- `grd=GridTopology(cellcentre.offset, cellsize, cells.dim)`
- `grd=as.SpatialPolygons.GridTopology(  
 grd,proj4string =TN@proj4string)` → 之後要對照的CRS
- `grd=SpatialPolygonsDataFrame(  
 grd, data=data.frame(c(1:N)),  
 match.ID = F)` → 只是給個ID



## 概念複習：VMR Test

$$VMR = \frac{vairance}{mean}$$

$$s.e. = \sqrt{\frac{2}{k-1}}$$

$$t = \frac{VMR - 1}{s.e.}, \quad df = k - 1$$