

Tarea 2 Calculo Actuarial III

Andrea Gardida

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BinNeg.Plot <- function(mu, n , p, a=NA,b=NA,calcProb=(!is.na(a) | !is.na(b)),quantile=NA,calcQuant=!is.na(quantile))
{
  # Poisson
  sd = sqrt(mu)
  low = max(0, round(mu - 3 * sd))
  high = round(mu + 5 * sd)
  values = low:high
  probs = dnbinom(values, n, p, mu, log= FALSE)
  plot(c(low,high), c(0,max(probs)), type = "n",
       xlab = "Numero de casos",
       ylab = "Masas de probabilidad",
       main = "")
  lines(values, probs, type = "h", col = 2)
  abline(h=0,col=3)
  if(calcProb) {
    if(is.na(a)){ a = 0 }
    if(is.na(b)){
      a = round(a)
      prob = 1-pnbinom(a-1,n,p,mu, lower.tail = TRUE, log.p = FALSE)
      title(paste("P(",a," <= Y ) = ",round(prob,6),sep=""),line=0,col.main=4)
      u = seq(max(c(a,low)),high,by=1)
    }
  }
  else {
    if(a > b) {d = a; a = b; b = d;}
    a = round(a); b = round(b)
    prob = pnbinom(b,n,mu, lower.tail = TRUE, log.p = FALSE) - pnbinom(a-1,n,mu,lower.tail = TRUE, log.p = FALSE)
    title(paste("P(",a," <= N <= ",b," ) = ",round(prob,6),sep=""),line=0,col.main=4)
    u = seq(max(c(a,low)),min(c(b,high)),by=1)
  }
  v = dnbinom(u,n,p, mu ,log = FALSE)
  lines(u,v,type="h",col=4)
}
else if(calcQuant==T) {
  if(quantile < 0 || quantile > 1)
    stop("El cuantil debe estar entre 0 y 1")
  x = qnbinom(quantile,n,p,mu, lower.tail = TRUE, log.p = FALSE )
  title(paste("",quantile," quantile = ",x,sep=""),line=0,col.main=4)
  u = 0:x
  v = dnbinom(u,n,p,mu, log = FALSE)
  lines(u,v,type="h",col=4)
}
return(invisible())
}
```

```
BinNeg.Plot(100,0.5)
```

