hw

Tianjian Xie

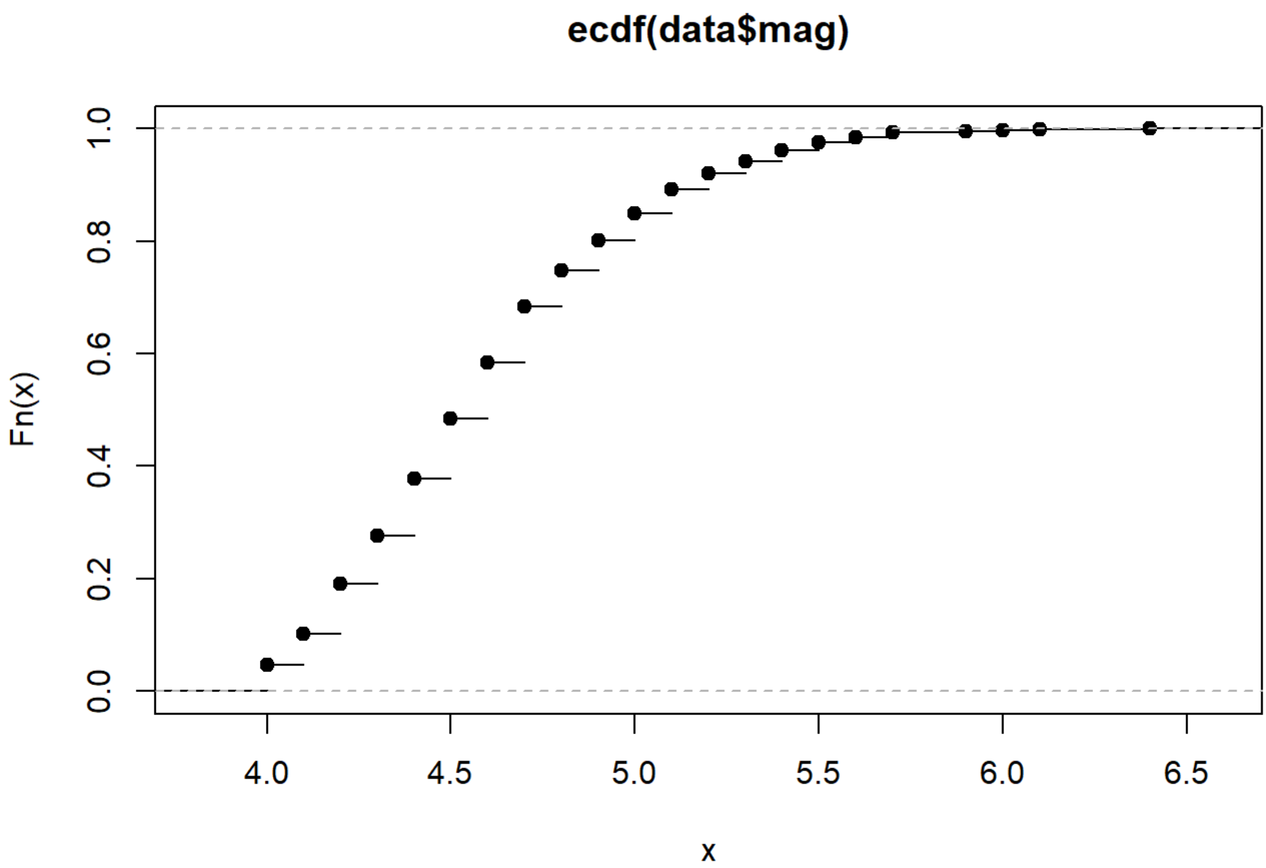
2023-03-24

Ans2:

The plug in estimator for p is $\frac{\sum_{i=1}^{n} X_i}{n}$, the SE of p is $\sqrt{\frac{p\times(1-p)}{n}}$, so the 90% CI of p is $\frac{\sum_{i=1}^{n} X_i}{n} \pm 1.645 \times \sqrt{\frac{p\times(1-p)}{n}}$. Similarly, the plug in estimator for p-q is $\frac{\sum_{i=1}^{n} X_i}{n} - \frac{\sum_{i=1}^{n} Y_i}{m}$, the SE of p-q is $\sqrt{\frac{p\times(1-p)}{n} + \frac{q\times(1-q)}{m}}$, so the 90% CI of p is $\frac{\sum_{i=1}^{n} X_i}{n} - \frac{\sum_{i=1}^{n} Y_i}{m} \pm 1.645 \times \sqrt{\frac{p\times(1-p)}{n} + \frac{q\times(1-q)}{m}}$.

Ans3:

```
data <- read.table("fijiquakes.dat",header = TRUE)
CDF <- ecdf(data$mag)
plot(CDF)
```




```
expectation <- CDF(4.9)-CDF(4.3)
sd <-  sd(data$mag)
CI95_upper <- expectation+1.96*sqrt(sd/1000)
CI95_lower <- expectation-1.96*sqrt(sd/1000)
print(c(CI95_lower,CI95_upper))
```

```
## [1] 0.4866644 0.5653356
```