

STAT313 Assignment1

Reuben Brown 57733966

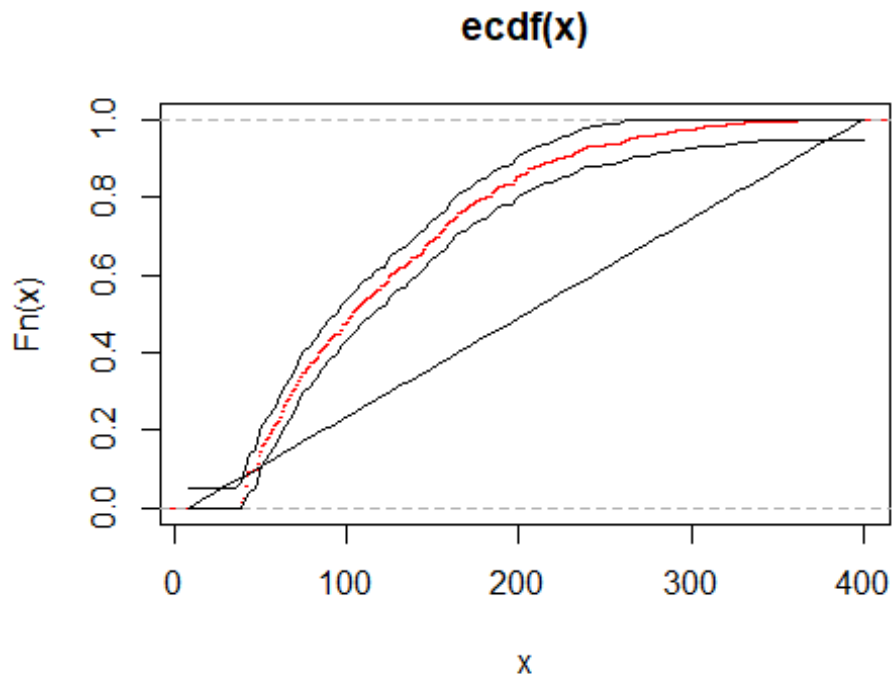
2023-03-20

Problem 4

```
# a
x <- ChickWeight$weight
n <- length(x)
alpha <- 0.1
epsilon <- sqrt((1/(2*n))*log(2/alpha))

est = ecdf(x)
plot(est, do.points=FALSE, col='red')

curve(pmin(est(x)+epsilon, 1), add=TRUE)
curve(pmax(est(x)-epsilon, 0), add=TRUE)
curve(punif(x, min(x), max(x)), add=TRUE)
```



B) We can rule out that the data was sampled from a uniform distribution as the cdf of the uniform distribution falls outside of the 95% confidence bands of our empirical distribution function.

```
# C
ks.test(x, "pnorm")

## Warning in ks.test.default(x, "pnorm"): ties should not be present for the
## Kolmogorov-Smirnov test

##
## Asymptotic one-sample Kolmogorov-Smirnov test
##
## data: x
## D = 1, p-value < 2.2e-16
## alternative hypothesis: two-sided
```

The p-value is smaller than 0.05. This means with 95% certainty we can reject the null hypothesis that the data was sampled from a uniform distribution.

- D) I used one-sample ks test so we can directly compare it to a normal distribution rather than using a two-sample test which would compare the data to a randomly generated uniformly distributed sample.