HW5 - 2022314 강현구.

#5.4.3.

CLT: Let $X_1, \dots, X_n$ be iid with a distribution with a mean μ and a variance σ^2. Then $\bar{X} = \frac{\sum_i^n X_i}{n}$ approximately follows $N(\mu, \frac{\sigma^2}{n})$ for a large n.

let. $Y = \log X$, $Y_i = \log X_i$

then. $Y = \sum_{i=1}^{n} Y_i$ s.t. Y_i are iid for $\forall i \in \{1, 2, \dots, n\}$

By CLT, $\bar{Y} = \frac{\sum_i^n Y_i}{n} = \frac{Y}{n} \sim N(\mu, \frac{\sigma^2}{n})$

$\therefore \ln X (= Y)$ follows $N(n\mu, n\sigma^2)$

#5.4.6.

(a). $\chi^2_{0.12,8} \approx 3.7374$

(b) $\chi^2_{0.54,19} \approx 18.9507$

(c) $\chi^2_{0.023,32} \approx 18.0976$

(d) $P(X \le 13.3) \approx 0.65238$

(e) $P(9.6 \le X \le 15.3) \approx 0.4255$

#5.4.8.

(a) $t_{0.27,14} \approx -0.6281$

(b) $t_{0.09,22} \approx -1.3847$

(c) $t_{0.016,7} \approx -2.6699$

(d) $P(X \le 1.78) \approx 0.9555$

(e) $P(-0.65 \le X \le 2.98) \approx 0.7353$

(f) $P(|X| \ge 3.02) = 0.006295$

#5.4.10

(a) $F_{0.04,7,37} \approx 0.2745$

(b) $F_{0.87,17,43} \approx 1.5289$

(c) $F_{0.035,3,8} \approx 0.0873$

(d) $P(X \geq 2.35) \approx 0.0625$

(e) $P(0.21 \leq X \leq 2.92) \approx 0.9285$

이후의 풀이는 jupyter로 답하겠습니다.