Assignment 8

Pericherla Pranav Varma
CS21BTECH11044

June 6, 2022

Outline

Question

Papoulis Pillai Ch5 Ex 8-27:

The weights of cereal boxes are the values of a random variable x with mean η. We measure 64 boxes and find that x = 7.7 oz. and s = 1.5 oz. Test the hypothesis H_o: η = 8 oz. against H_1: *eta* $\neq$ 8oz. with α = 0.1 and α = 0.01.

Solution

From Hypothesis testing,
Critical region $\left|x - \eta_0\right| > t_{1-\alpha/2}(n-1)\frac{s}{\sqrt{n}}$

$q_u = t_u(n-1)$

(i) $\underline{\alpha = 0.1}$

$$t_{1-\alpha/2}(n-1) = t_{1-0.05}(64-1) = t_{0.95}(63) = 1.67$$

$$\left|x - 8\right| > 1.67 \times 1.5/8 = 0.313$$

Thus interval of $x = 8 \pm 0.313$

Solution

Since the $x = 7.7$ lies in interval of 8 ± 0.313

we accept H_0

(ii) $\alpha = 0.01$

$$t_{1-\alpha/2}(n-1) = t_{1-0.005}(64-1) = t_{0.995}(63) = 2.62$$

$$\left|x - 8\right| > 2.62 \times 1.5/8 = 0.49$$

Thus interval of $x = 8 \pm 0.49$

Solution

Since $x = 7.7$ is inside the interval of 8 ± 0.49

We accept H_0

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

pranav@XPS:~/Desktop/Acads/P&Rv/Assig 8$ python3 -u "/home/pranav/Desktop/Acads/P&Rv/Assig 8/code.py"
We accept Ho
We accept Ho
pranav@XPS:~/Desktop/Acads/P&Rv/Assig 8$
```

Figure 0: Verification Code