

Assignment 8

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CS21BTECH11044

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Outline

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2 Solution

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 $\bar{x} = 7.7$ oz. and $s = 1.5$ oz. Test the hypothesis $H_0: \eta = 8$ oz. against $H_1: \eta \neq 8$ oz. with $\alpha = 0.1$ and $\alpha = 0.01$.

Solution

From Hypothesis testing,

$$\text{Critical region } |x - \eta_0| > t_{1-\alpha/2}(n-1) \frac{s}{\sqrt{n}}$$

$$q_u = t_u(n-1)$$

(i) $\alpha = 0.1$

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

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

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) $\alpha = 0.01$

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

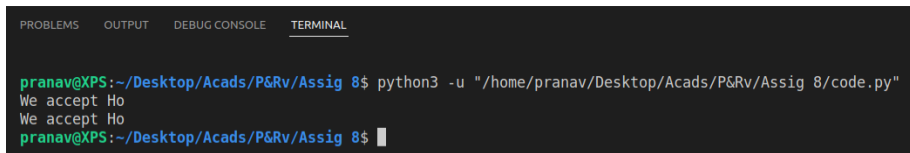
$$|x - 8| > 2.62 \times 1.5/8 = 0.49$$

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