

1) a.

$$P(Z \leq 0.57) = 0.7156612$$

b.

$$P(Z \leq -0.32) = 0.3744842$$

c.

$$P(Z \geq 2.10) = 0.01786442$$

d.

$$P(-0.32 \leq Z \leq 1.55) = 0.5649451$$

e.

$$z = -0.4399132$$

f.

$$z = 0.2567134$$

2) $Y \sim N(\mu = 6, \sigma = 0.8)$

a.

$$P(Y \leq 7) = 0.8943502$$

b.

$$P(Y > 5.4) = 0.7733726$$

c.

$$P(6 \leq Y \leq 7.2) = 0.4331928$$

d.

$$y = 6.829147$$

3)

a.

$$df=25, P(T > 1.708) = 0.05$$

b.

$$df=9, P(-t < T < t) = 0.95, t = 2.262$$

c.

$$df=25, P(T > 1.708) = 0.05, t = -1.298714$$

4)

a.

As the distribution of Y is skewed, empirical rule for normal distribution can't be applied. In this case, Chebyshev's rule should be applied for determining 75% interval.

From Chebyshev's rule,

$$P(\mu - 2\frac{\sigma}{\sqrt{n}} \leq \bar{y} \leq \mu + 2\frac{\sigma}{\sqrt{n}}) = 0.75$$

Or, $P(90 - 2 \leq \bar{y} \leq 90 + 2) = 0.75$

Or, $P(88 \leq \bar{y} \leq 92) = 0.75$

Where \bar{y} is the sample mean of $n=100$ samples.

b.

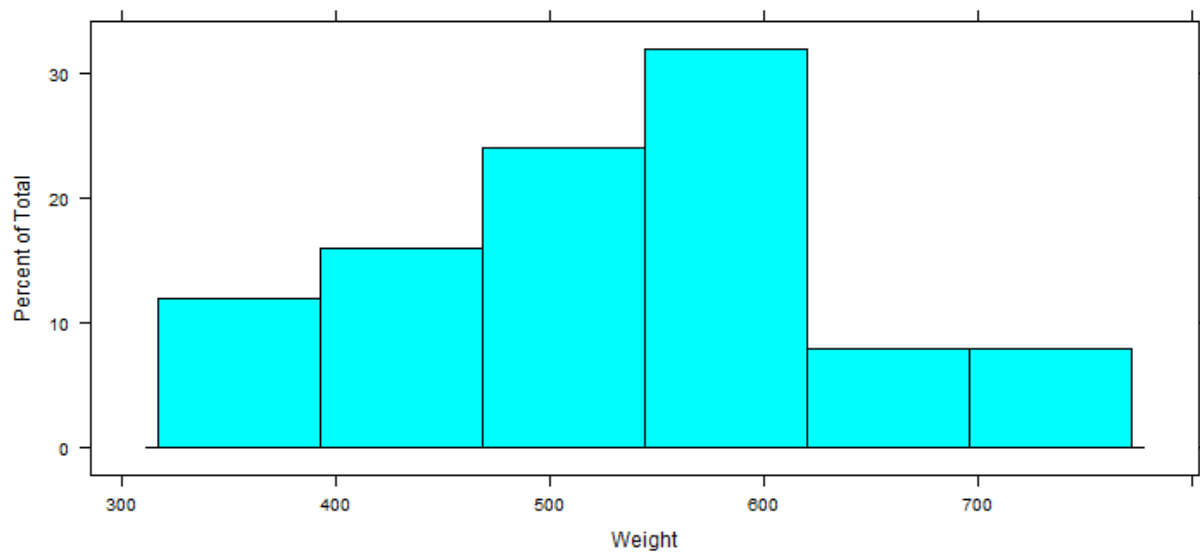
According to the Central Limit Theorem, the distribution of \bar{Y} is close to normal as n is large ($n=100$). So the shape of the distribution will follow normal distribution (bell shaped curve) $[\bar{Y} \sim (\mu, \frac{\sigma}{\sqrt{n}})]$

Mean = $\mu = 90$

Standard deviation $s = \frac{\sigma}{\sqrt{n}} = \frac{10}{\sqrt{100}} = 1$

5)

a.



Sample mean $\bar{y} = 526.12$

Sample sd , $s = 113.7279$

b.

From the histogram, the sample data looks like a normal distribution. So from the empirical rule, 95% ($\alpha = 0.05$) confidence interval for μ is $(\bar{y} \pm t_{\alpha/2} \frac{s}{\sqrt{n}})$

Now, $t_{\alpha/2} = t_{0.05/2} = t_{0.025}$, and $df = n-1 = 25-526.121 = 24$.

From Student's t-distribution, $t_{0.025}$ for $df = 24$ is 2.064.

So, confidence interval $= (\bar{y} \pm t_{\alpha/2} \frac{s}{\sqrt{n}}) = (526.12 \pm (2.064) \frac{113.7279}{\sqrt{25}}) = (526.12 \pm 46.95) = (479.17, 573.07)$

c.

We can be 95% confident that population mean seed weight is contained in the 95% confidence interval (479.17, 573.07).