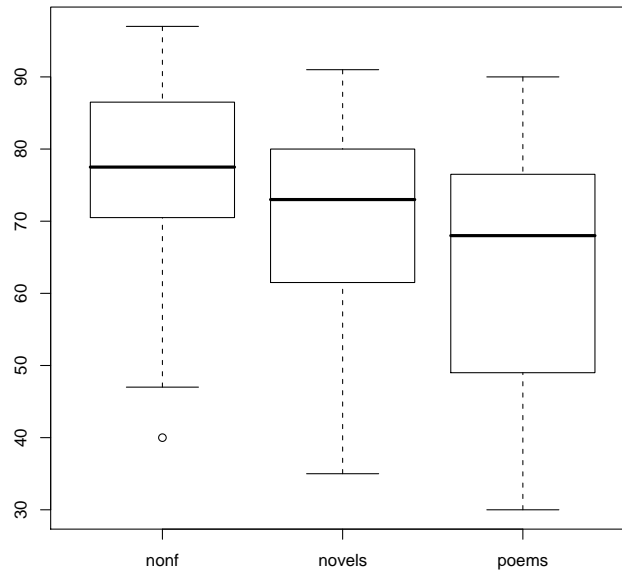


Solution 1

(a) summary statistics



Categories	mean	standard deviation	sample size
novelist	71.44776	13.05151	67
poet	63.18750	17.29710	32
nonfiction writer	76.875	14.09691	24

(b) Assumptions: Populations are normal with the same standard deviation.

(c) ANOVA

$$H_0 : \mu_{NOV} = \mu_P = \mu_{NF}$$

H_a : population mean are not all equal.

ANOVA table and F statistic

	SS	DF	MS	F
between the group	2 744.19	2	1 372.10	6.56
within the group	25 088.07	120	209.07	
Total	27 832.26	122		

Since $F_{ob} > F_{.05}(2, 120) = 3.072$, we can reject H_0 at 5% level of significance and conclude that the mean age of death for different groups of writers are not the same.

NOTE: If you cannot find the exact F value in the F table, find the value closest to the critical value. In this example you may find $F_{.05}(2, 100)$.

(d)

$$H_0 : \mu_P = \frac{1}{2}(\mu_{NOV} + \mu_{NF})$$

$$H_a : \mu_P < \frac{1}{2}(\mu_{NOV} + \mu_{NF})$$

T.S.

$$\begin{aligned}c &= a_p \bar{x}_p + a_{nov} \bar{x}_{nov} + a_{nf} \bar{x}_{nf} \\&= 1 \times 63.19 - 0.5 \times 71.45 - 0.5 \times 76.88 \\&= -11 \\SE_c &= \sqrt{\text{MSE}} \sqrt{\frac{a_P^2}{n_P} + \frac{a_{NOV}^2}{n_{NOV}} + \frac{a_{NF}^2}{n_{NF}}} \\&= \sqrt{209.07} \sqrt{1/32 + 0.25/67 + 0.25/24} \\&\approx 3.12 \\t &= \frac{c}{SE_c} = \frac{-11}{3.12} \approx -3.51 \\ \nu &= 120\end{aligned}$$

R.R. : Reject H_0 if $t < -t_{.05}(120) = -1.658$

Conclusion: Since $t_{ob} < -1.658$, we can reject H_0 at 5% level of significance and conclude that poets die younger than novelist and nonfiction writers.