R-Programming

① Test Scores A (85, 88, 90, 92, 87)

Test Scores B (82, 85, 88, 86, 90)

x_1	x_2	$(x_1 - \bar{x}_1)^2$	$(x_2 - \bar{x}_2)^2$
85	82	11.56	17.64
88	85	0.16	1.44
90	88	2.56	3.24
92	86	12.96	0.04
87	90	1.96	14.44
$\bar{x}_1 = 88.4$	$\bar{x}_2 = 86.2$	$\Sigma = 29.20$	$\Sigma = 36.75$

$$t = \frac{|\bar{x}_1 - \bar{x}_2|}{\sqrt{\frac{(SD_1)^2}{n_1} + \frac{(SD_2)^2}{n_2}}}$$

$$SD_1 = \sqrt{\frac{\Sigma(x_1 - \bar{x}_1)^2}{n-1}}$$

$$= 2.69$$

$$SD_2 = \sqrt{\frac{\Sigma(x_2 - \bar{x}_2)^2}{n-1}}$$

$$= 3.04$$

$$t = \frac{|88.4 - 86.2|}{\sqrt{\frac{7.2361}{5}} + \sqrt{\frac{9.2416}{5}}}$$

$$= \frac{2.2}{1.6217}$$

$$t = 1.355$$

2) Control Group

Before	After	diff (x)	$(diff)^2$
120	118	2	4
125	123	2	4
118	116	2	4
130	128	2	4
122	120	2	4
		$\Sigma = 10$	$\Sigma = 20$

λ = mean = 10/2

= 5

$$S.D = \sqrt{\frac{20 - \frac{(5)^2}{5}}{4}} = 1.9364$$

$$T\text{-test} = \frac{5}{1.9364/\sqrt{5}}$$

$$= 5.7737$$

Df = 4

(Degree of Freedom)

From t-table = 3.747 (critical value)

$3.747 < 5.7737$

∴ Reject Null hypothesis as

Critical value is ~~rejected~~ less.

Drug Group

Before	After	diff (x)	$(diff)^2$
122	118	4	16
128	122	6	36
115	112	3	9
135	130	5	25
125	120	5	25
		$\Sigma = 23$	$\Sigma = 111$

λ = mean = 23/5

= 4.6

$$S.D = \sqrt{\frac{111 - \frac{(23)^2}{5}}{4}}$$

= 1.1401

$$T\text{-test} = \frac{4.6}{1.1401/\sqrt{5}}$$

= 7.3418

D.F = 4

From t-table = 3.747 (critical value)

7.3418 > 3.747

∴ Reject Null-Hypothesis