Assignment 3 Question No : 3 :

Given Values:

	N	Mean	Std.Dev	SE Mean
Y1	20	50.19	1.71	0.38
Y2	20	52.52	2.48	0.55

Difference : mu(X1) - mu(X2)

Estimate for difference : - 2.33341

95% CI for difference : (-3.69547, - 0.97135)

T-test of difference = 0 T- value = - 3.47

P-value = 0.001 DF = 38

Pooled Std = 2.1277

Answers

(a) Yes, the Null Hypothesis can be rejected.
This is due to the fact that the P-value of 0.001 is less than the significance value.

(b) This is a two sided test as no boundings are mentioned here - ie the alternate hypothesis does not specify the direction of difference.

(c) To determine whether the Null Hypothesis is can be rejected at the 0.05 level with the alternate Hypothesis ($\mu_1 - \mu_2 \neq 2$) we need to compare the calculated confidence interval with the value of 2. If the interval does not contain 2, then the Null Hypothesis can be rejected at the 0.05 level.

The 95% CI for the difference in means is (-3.69547, -0.97135). Since 2 is not within this interval we reject the Null Hypothesis at the 0.05 level in favour of alternate Hypothesis.

(d) Yes, no additional calculations are required because the test is naturally becoming more significant will change the value from -2.33341 to -4.33341.

(e) Using $\alpha = 0.05$ for 95% CI,

for two failed test $t = 2.024$.

Replacing the values in the program for Q1(b) I get

$$-2.33341 + 2.1277 \times 2.024 \times \sqrt{\frac{1}{20} + \frac{1}{20}}$$

$$= -2.33341 + 1.3618237$$

$$= \underline{-0.972} \quad \underline{\text{(Ans)}}$$