Assignment - Chapter 12

Complete the following problems related to the chapter 12. Upload your work as a single PDF file before deadline. Use a $t-$ table or technology to calculate the critical score or $p-$values.

1. During last year New Year's eve (i.e. December 31st, 2022), a heavy snowfall hit the northern parts of the United States. Two major airports in the north, O'Hare International Airport in Chicago and Logan International Airport in Boston experienced major travel delay in New Year's eve. From a sample of 238 randomly chosen flights departing from Chicago, the mean delay was of 2.8 hours with a standard deviation of 1.2 hours. Meanwhile, from a sample of 314 randomly chosen flights departing from Boston, the mean delay was of 2.5 hours with a standard deviation of 1.6 hours. The output to compute the confidence interval for a difference between two means is in the table below.

Descriptive Statistics:

Group	Sample Size	Mean	Std. Dev.
Group 1	238	2.80	1.20
Group 2	312	2.50	1.60

Estimate of Difference of Means:

Point Estimate	Standard Error	Margin of Error
0.3000	0.1194	± 0.2345

Confidence Interval:

Population Parameter	Lower Bound	Upper Bound	Confidence Level
Difference $\mu_1 - \mu_2$	0.0655	0.5345	95%

Report and interpret the meaning of confidence interval from the table above in the context of the problem.

Is there a significant difference between the mean delay times for the flights departing out of O'Hare International Airport in Chicago and Logan International Airport in Boston? Explain your reasoning.

2. For the same problem as question 1, the results for hypothesis testing is as follows:

Descriptive Statistics:

Group	Sample Size	Mean	Std. Dev.
Group 1	238	2.80	1.20
Group 2	312	2.50	1.60

Test Statistic:

Observed Difference	Standard Error	Test Statistic t
0.300	0.119	2.513

Is there a significant difference between the mean delay times for the flights departing out of O'Hare International Airport in Chicago and Logan International Airport in Boston? Write the null and alternative hypotheses for this scenario.

What is the value of test statistic?

If $p-\text{value} = 0.0123$, write the conclusion of this hypothesis test in context of the problem.

Compare the conclusion from the confidence interval and hypothesis test.