**QUESTION 3**

**Code: t Tests**

/\*

\*

\* Task code generated by SAS Studio 3.8

\*

\* Generated on '1/11/22, 8:30 AM'

\* Generated by 'u45209732'

\* Generated on server 'ODAWS01-USW2.ODA.SAS.COM'

\* Generated on SAS platform 'Linux LIN X64 3.10.0-1062.9.1.el7.x86\_64'

\* Generated on SAS version '9.04.01M6P11072018'

\* Generated on browser 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/96.0.4664.110 Safari/537.36'

\* Generated on web client 'https://odamid-usw2.oda.sas.com/SASStudio/main?locale=en\_US&zone=GMT-05%253A00&https%3A%2F%2Fodamid-usw2.oda.sas.com%2FSASStudio%2Findex='

\*

\*/

ods noproctitle;

ods graphics / imagemap=on;

/\* Test for normality \*/

**proc** **univariate** data=WORK.TRAIN normal mu0=**0**;

ods select TestsForNormality;

class Vehicle\_Damage;

var Annual\_Premium;

**run**;

/\* t test \*/

**proc** **ttest** data=WORK.TRAIN sides=**2** h0=**0** plots(showh0);

class Vehicle\_Damage;

var Annual\_Premium;

**run**;

**Log: t Tests**

Warnings (2)

Notes (5)

1 OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;

NOTE: ODS statements in the SAS Studio environment may disable some output features.

73

74 /\*

75 \*

76 \* Task code generated by SAS Studio 3.8

77 \*

78 \* Generated on '1/11/22, 8:30 AM'

79 \* Generated by 'u45209732'

80 \* Generated on server 'ODAWS01-USW2.ODA.SAS.COM'

81 \* Generated on SAS platform 'Linux LIN X64 3.10.0-1062.9.1.el7.x86\_64'

82 \* Generated on SAS version '9.04.01M6P11072018'

83 \* Generated on browser 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko)

83 ! Chrome/96.0.4664.110 Safari/537.36'

84 \* Generated on web client

84 ! 'https://odamid-usw2.oda.sas.com/SASStudio/main?locale=en\_US&zone=GMT-05%253A00&https%3A%2F%2Fodamid-usw2.oda.sas.com%2FS

84 ! ASStudio%2Findex='

85 \*

86 \*/

87

88 ods noproctitle;

89 ods graphics / imagemap=on;

90

91 /\* Test for normality \*/

92 proc univariate data=WORK.TRAIN normal mu0=0;

93 ods select TestsForNormality;

94 class Vehicle\_Damage;

95 var Annual\_Premium;

96 run;

NOTE: PROCEDURE UNIVARIATE used (Total process time):

real time 0.23 seconds

user cpu time 0.23 seconds

system cpu time 0.02 seconds

memory 7960.18k

OS Memory 43952.00k

Timestamp 01/11/2022 01:30:59 PM

Step Count 49 Switch Count 4

Page Faults 0

Page Reclaims 1582

Page Swaps 0

Voluntary Context Switches 15

Involuntary Context Switches 0

Block Input Operations 0

Block Output Operations 8

97

98 /\* t test \*/

99 proc ttest data=WORK.TRAIN sides=2 h0=0 plots(showh0);

100 class Vehicle\_Damage;

101 var Annual\_Premium;

102 run;

NOTE: HTML data tips have been disabled for at least one plot because the threshold has been reached. You can set TIPMAX=37200 in

the ODS GRAPHICS statement to produce data tips for all plots.

NOTE: HTML data tips have been disabled for at least one plot because the threshold has been reached. You can set TIPMAX=192500 in

the ODS GRAPHICS statement to produce data tips for all plots.

WARNING: This graph has too many graphical elements. You may not be able to get any vector graphics output and in that case, you

can set your output format to an image type.

WARNING: This graph has too many graphical elements. You may not be able to get any vector graphics output and in that case, you

can set your output format to an image type.

NOTE: PROCEDURE TTEST used (Total process time):

real time 2:24.10

user cpu time 1:22.53

system cpu time 42.70 seconds

memory 747304.04k

OS Memory 796720.00k

Timestamp 01/11/2022 01:33:23 PM

Step Count 50 Switch Count 149

Page Faults 0

Page Reclaims 15831382

Page Swaps 0

Voluntary Context Switches 225139

Involuntary Context Switches 144

Block Input Operations 0

Block Output Operations 1635384

103

104 OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;

116

**Results: t Tests**

**Variable: Annual\_Premium**

**Vehicle\_Damage = No**

| **Tests for Normality** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Kolmogorov-Smirnov** | **D** | 0.113936 | **Pr > D** | <0.0100 |
| **Cramer-von Mises** | **W-Sq** | 729.2532 | **Pr > W-Sq** | <0.0050 |
| **Anderson-Darling** | **A-Sq** | 4664.217 | **Pr > A-Sq** | <0.0050 |

**Variable: Annual\_Premium**

**Vehicle\_Damage = Yes**

| **Tests for Normality** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Kolmogorov-Smirnov** | **D** | 0.1346 | **Pr > D** | <0.0100 |
| **Cramer-von Mises** | **W-Sq** | 724.648 | **Pr > W-Sq** | <0.0050 |
| **Anderson-Darling** | **A-Sq** | 5021.088 | **Pr > A-Sq** | <0.0050 |

**Variable: Annual\_Premium**

| **Vehicle\_Damage** | **Method** | **N** | **Mean** | **Std Dev** | **Std Err** | **Minimum** | **Maximum** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** |  | 188696 | 30401.9 | 15980.9 | 36.7892 | 2630.0 | 540165 |
| **Yes** |  | 192413 | 30723.8 | 18340.0 | 41.8102 | 2630.0 | 540165 |
| **Diff (1-2)** | **Pooled** |  | -321.9 | 17212.4 | 55.7658 |  |  |
| **Diff (1-2)** | **Satterthwaite** |  | -321.9 |  | 55.6915 |  |  |

| **Vehicle\_Damage** | **Method** | **Mean** | **95% CL Mean** | | **Std Dev** | **95% CL Std Dev** | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** |  | 30401.9 | 30329.8 | 30474.0 | 15980.9 | 15930.1 | 16032.1 |
| **Yes** |  | 30723.8 | 30641.8 | 30805.7 | 18340.0 | 18282.3 | 18398.1 |
| **Diff (1-2)** | **Pooled** | -321.9 | -431.2 | -212.6 | 17212.4 | 17173.9 | 17251.2 |
| **Diff (1-2)** | **Satterthwaite** | -321.9 | -431.0 | -212.7 |  |  |  |

| **Method** | **Variances** | **DF** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- |
| **Pooled** | Equal | 381107 | -5.77 | <.0001 |
| **Satterthwaite** | Unequal | 375917 | -5.78 | <.0001 |

| **Equality of Variances** | | | | |
| --- | --- | --- | --- | --- |
| **Method** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **Folded F** | 192412 | 188695 | 1.32 | <.0001 |

Chart, histogram

Description automatically generated

Chart, line chart

Description automatically generated