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TE Comps
Subject: Data Analytics Lab

Exp No.: 03

Aim:

Hypothesis Testing using SAS

Data Set:

The Inbuilt DataSet of Heart is available in SAS software and has 17 rows.

Code:

```
/*Does Weight_status impact cholesterol*/

DATA WORK.HEART;
    SET SASHELP.HEART;
    IF UPCASE(WEIGHT_STATUS) NE "UNDERWEIGHT";
RUN;

TITLE "PROC TTEST = Cholesterol vs Weight Status";
PROC TTEST DATA=WORK.HEART;
    CLASS WEIGHT_STATUS;
    VAR CHOLESTEROL;
RUN;

/* Reject the Null Hypothesis*/

ODS GRAPHICS ON;

TITLE "One way anova age of death vs chol status";
PROC GLM DATA=SASHELP.HEART PLOTS=DIAGNOSTICS(UNPACK);
    CLASS CHOL_STATUS;
    MODEL AGEATDEATH=CHOL_STATUS;
    MEANS CHOL_STATUS / HOVTEST;
RUN;
QUIT;
```

```
ODS GRAPHICS OFF;
```

```
/* ACCEPT the Null Hypothesis: (VARIANCES ATE EQUAL)*/
```

```
/*R-SQUR LESS : NOT CORRELATED*/
```

```
ODS GRAPHICS ON;
```

```
TITLE "Post Hoc Pairwise Comparision";
```

```
PROC ANOVA DATA=SASHELP.HEART;
```

```
    CLASS CHOL_STATUS;
```

```
    MODEL AGEATDEATH=CHOL_STATUS;
```

```
    LSMEANS CHOL_STATUS / PDIFF=ALL ADJUST=TUKEY;
```

```
    LSMEANS CHOL_STATUS / PDIFF=CONTROL("Borderline") ADJUST=DUNNETT;
```

```
RUN;
```

```
QUIT;
```

```
ODS GRAPHICS OFF;
```

```
PROC ANOVA DATA=SASHELP.HEART;
```

```
    CLASS CHOL_STATUS;
```

```
    MODEL AGEATDEATH=CHOL_STATUS;
```

```
    MEANS CHOL_STATUS/ tukey lines;
```

```
RUN;
```

OUTPUT:

PROC TTEST = Cholesterol vs Weight Status

The TTEST Procedure

Variable: Cholesterol

Weight_Status	Method	N	Mean	Std Dev	Std Err	Minimum	Maximum
Normal		1430	218.6	42.4990	1.1239	118.0	568.0
Overweight		3445	232.1	45.3764	0.7731	96.0000	534.0
Diff (1-2)	Pooled		-13.5483	44.5519	1.4015		
Diff (1-2)	Satterthwaite		-13.5483		1.3641		

Weight_Status	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
Normal		218.6	216.4	220.8	42.4990	40.9966	44.1167
Overweight		232.1	230.6	233.6	45.3764	44.3298	46.4741
Diff (1-2)	Pooled	-13.5483	-16.2959	-10.8008	44.5519	43.6848	45.4544
Diff (1-2)	Satterthwaite	-13.5483	-16.2230	-10.8736			

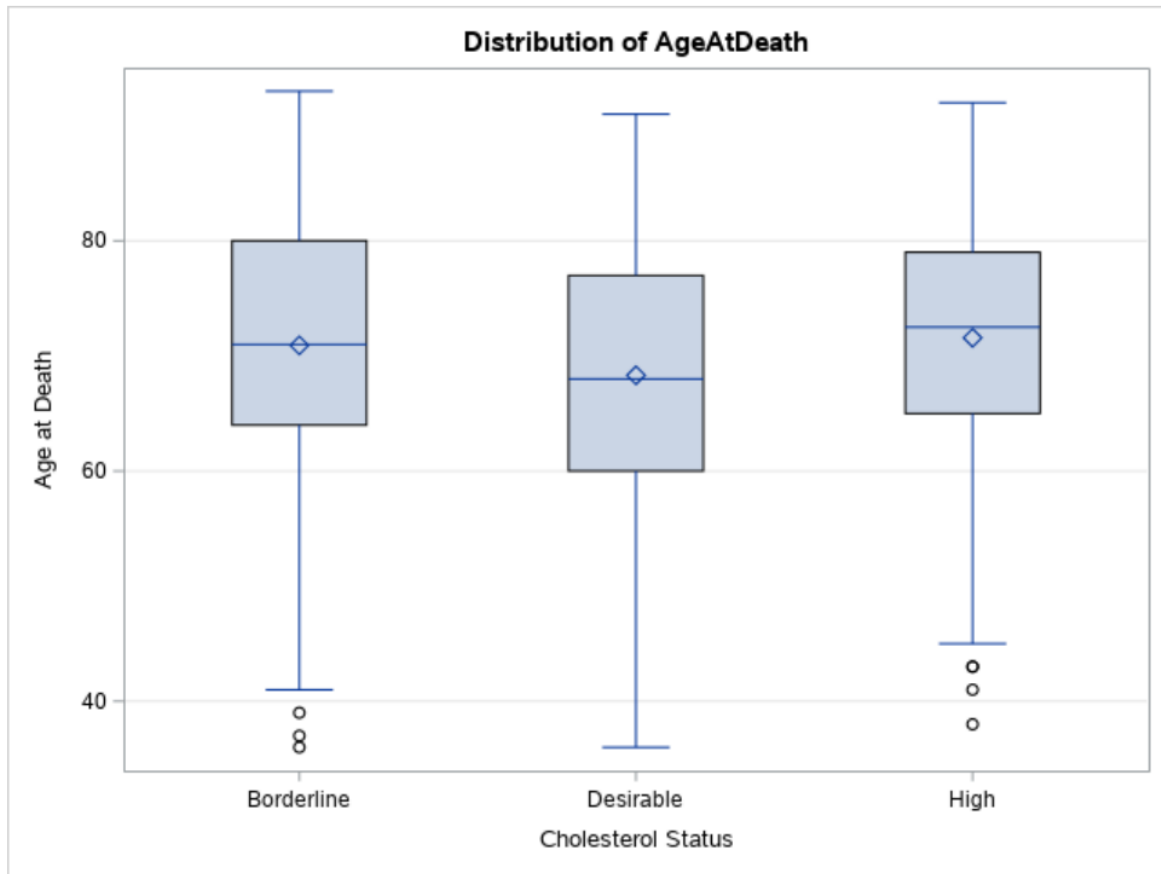
Method	Variances	DF	t Value	Pr > t
Pooled	Equal	4873	-9.67	<.0001
Satterthwaite	Unequal	2837.7	-9.93	<.0001

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	3444	1429	1.14	0.0036

One way anova age of death vs chol status

The GLM Procedure

Levene's Test for Homogeneity of AgeAtDeath Variance ANOVA of Squared Deviations from Group Means					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Chol_Status	2	65118.3	32559.1	1.67	0.1886
Error	1919	37425891	19502.8		



Conclusion:

As shown above the p-value for WEIGHT_STATUS, CHOLESTEROL is lesser than 0.01. Therefore we reject the null hypothesis, which means Weight_status impacts cholesterol.

Also, the p-value for an age of death vs chol status is more than 0.01. Therefore we accept the null hypothesis.