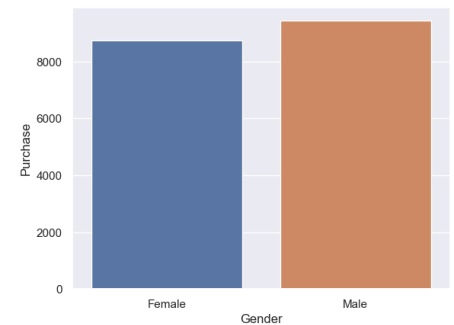


## Q1. Are women spending more money per transaction than men? Why or Why not?

Gender	Purchase
Female	8734.565765
Male	9437.526040



Ho -> Man Spend more than Women on Black Friday

Ha -> Women Spend more than Man on Black Friday

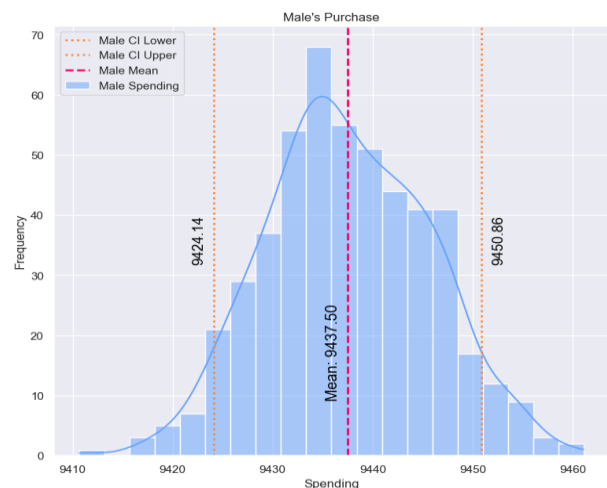
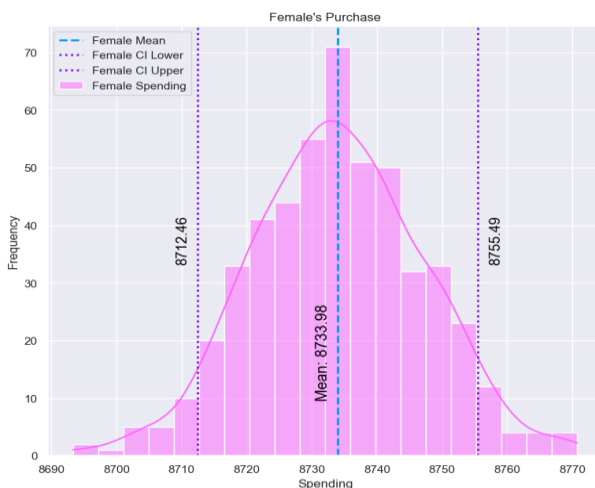
Samples size = 500

```
ttest_ind(female_df, male_df, alternative="greater")
```

p\_value = 1.0

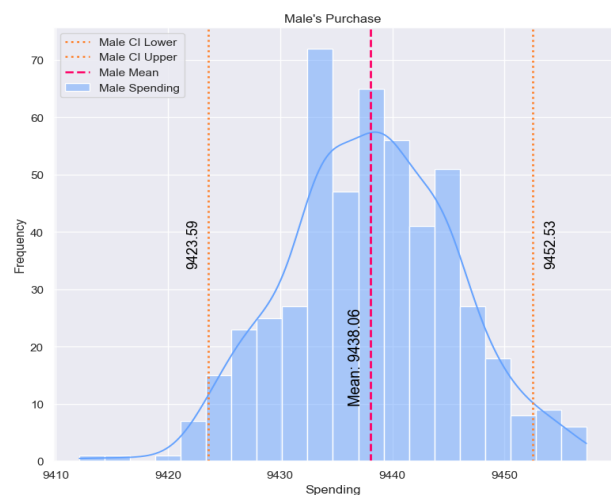
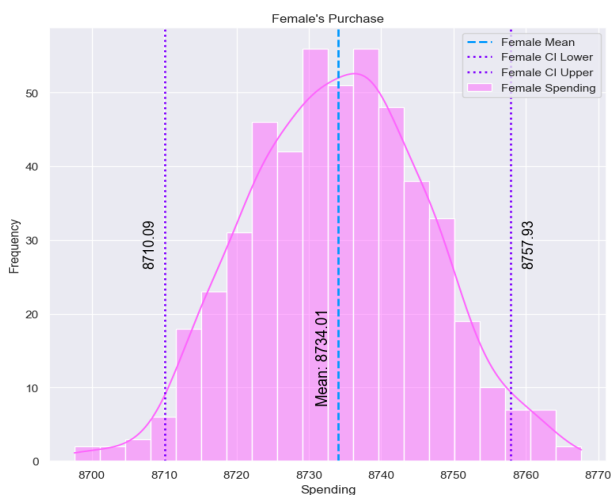
### With 90% Confidence Interval

Walmart Male vs Female Purchase at 90% Confidence Interval



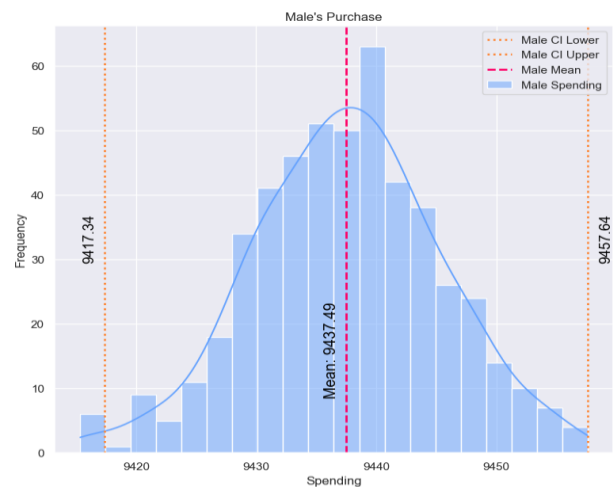
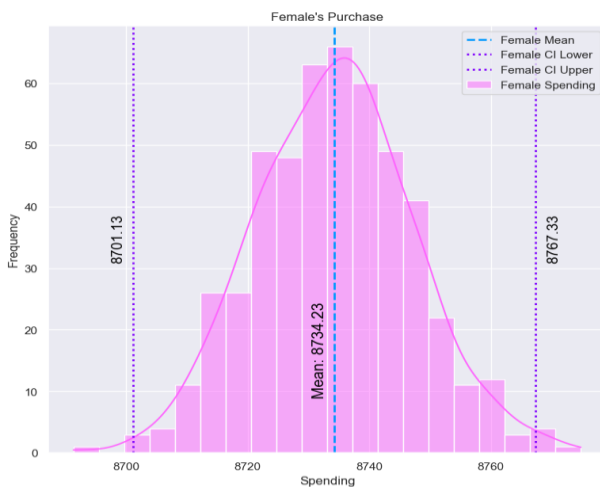
### With 95% Confidence Interval

Walmart Male vs Female Purchase at 95% Confidence Interval



## With 99% Confidence Interval

Walmart Male vs Female Purchase at 99% Confidence Interval



### Insights

Men Spend More than Women on Black Friday Sale.

Ho -> Man Spend more than Women on Black Friday

Ha -> Women Spend more than Man on Black Friday

Using T-Test p\_value of Women Spend more than Man on Black Friday found as 100%.

- With Confidence interval of **90%** & Sample Size of **500**
  - Mean Purchase by Female is **8735.71** with an Intervals of (8714.39 - 8757.04).
  - Mean Purchase by Male is **9437.51** with an Intervals of (9424.52 - 9450.50)
  - As 100% > 10% Thus Failed to Rejecting Ho.
- With Confidence interval of **95%** & Sample Size of **500**
  - Mean Purchase by Female is **8734.93** with an Intervals of (8710.22 - 8759.65).
  - Mean Purchase by Male is **9437.05** with an Intervals of (9421.23 - 9452.87)
  - As 100% > 5% Thus Failed to Rejecting Ho.
- With Confidence interval of **99%** & Sample Size of **500**
  - Mean Purchase by Female is **8733.73** with an Intervals of (8700.89 - 8766.57).
  - Mean Purchase by Male is **9437.61** with an Intervals of (9417.41 - 9457.81)
  - As 100% > 1% Thus Failed to Rejecting Ho.

As per T-Test we can Conclude woman are not spending more money per transaction than man.

## Q2. Confidence intervals and distribution of the mean of the expenses by female and male customers

While Answering Q1. We have calculated Confidence Interval and Distribution of Means for Male& Female. And found.

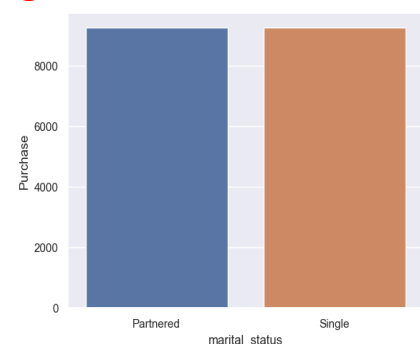
### Q3. Using Confidence intervals check if spending for Male vs Female is overlapping or not overlapping.

- While Answering Q1. we have calculated Confidence Interval and Distribution of Means for Male& Female.
- And found that there is no Overlapping in Man & Women's Purchase.

To Increase Purchase by Women or Sales to Women we need to provide Women's Centric Discount & Add more Women Centric Products.

### Q4. Using Confidence intervals check if spending for Married vs Unmarried are overlapping or not overlapping.

Marital Status	Purchase
Partnered	9261.174574
Single	9265.907619



Ho -> Single & Partnered peoples are Spend significantly equal on Black Friday  
Ha -> Single & Partnered peoples are Spend significantly different on Black Friday

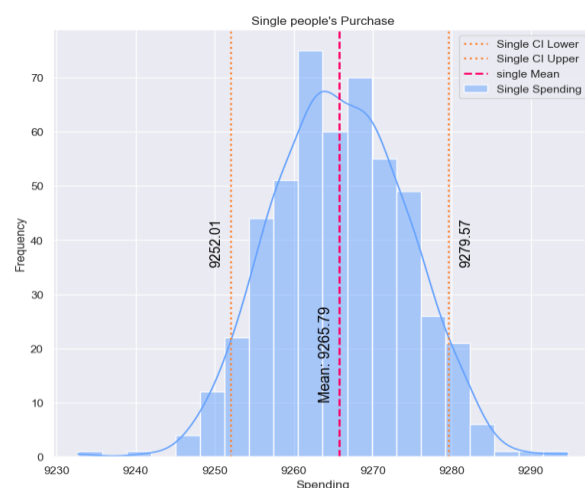
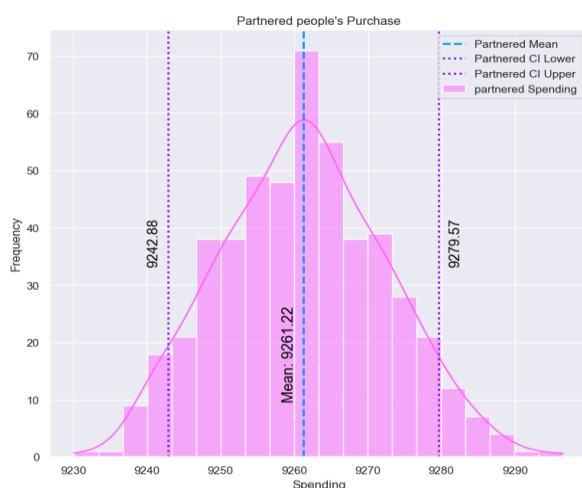
Samples size = 500

```
ttest_ind(single_df, partnered_df)
```

p\_value = 0.7310947525758316

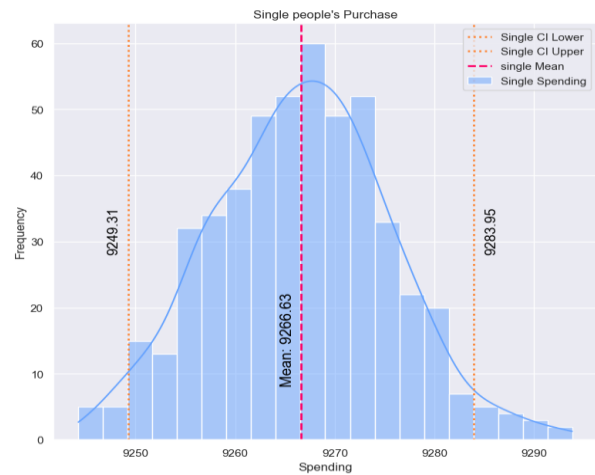
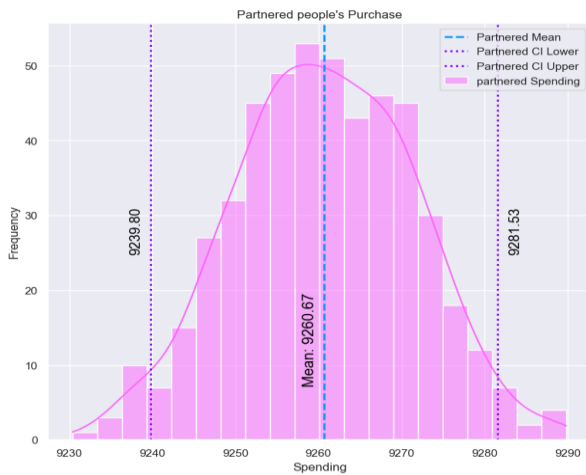
### With 90% Confidence Interval

Walmart Single vs Partnered Purchase at 90% Confidence Interval



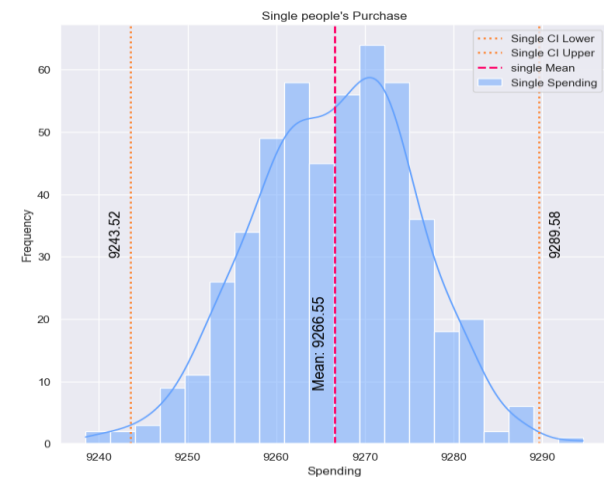
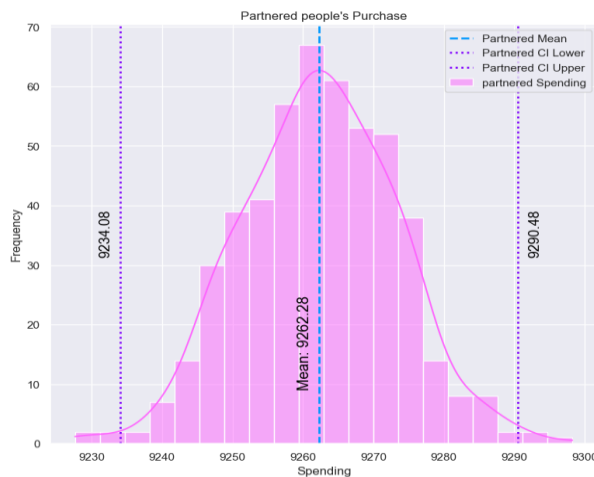
## With 95% Confidence Interval

Walmart Single vs Partnered Purchase at 95% Confidence Interval



## With 99% Confidence Interval

Walmart Single vs Partnered Purchase at 99% Confidence Interval



## Insights

Single & Partnered peoples are Spend significantly equal on Black Friday. `Marital Status` doesn't affect Purchase.

Ho -> Single & Partnered peoples are Spend significantly equal on Black Friday

Ha -> Single & Partnered peoples are Spend significantly different on Black Friday

Using T-Test p\_value of Partnered & Single Purchase different than each other found as 73.1094%.

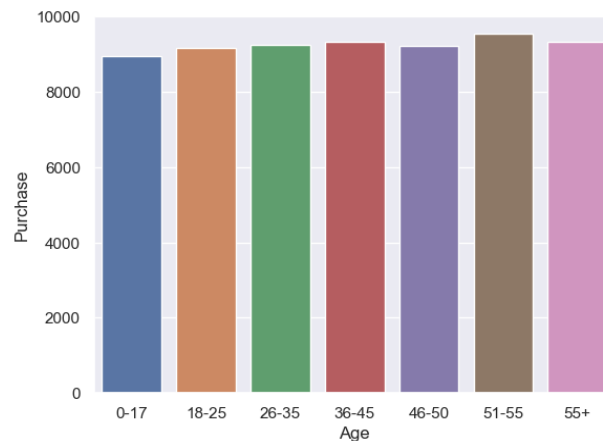
- With Confidence interval of **90%** & Sample Size of **500**
  - Mean Purchase by Partnered is **9261.22** with an Intervals of (9242.88 - 9279.57).
  - Mean Purchase by Single is **9265.79** with an Intervals of (9252.01 - 9279.57).
  - As 73.10% > 10% Thus Failed to Rejecting Ho.
- With Confidence interval of **95%** & Sample Size of **500**
  - Mean Purchase by Partnered is **9260.71** with an Intervals of (9240.36 - 9281.06).
  - Mean Purchase by Single is **9265.94** with an Intervals of (9248.55 - 9283.32)
  - As 73.10% > 5% Thus Failed to Rejecting Ho.

- With Confidence interval of **99%** & Sample Size of **500**
  - Mean Purchase by Partnered is **9261.62** with an Intervals of (9234.07 - 9289.17).
  - Mean Purchase by Single is **9266.31** with an Intervals of (9243.13 - 9289.49)
  - As 73.10% > 1% Thus Failed to Rejecting Ho.

As per T-Test we can Conclude Married & Unmarried Peoples Purchase are Overlapping.

## Q5. Using Confidence intervals check if spending for different Age Group is overlapping or not overlapping.

Age	Purchase
51-55	9534.808031
55+	9336.280459
36-45	9331.350695
26-35	9252.690633
46-50	9208.625697
18-25	9169.663606
0-17	8933.464640



Ho -> Mean Purchase for All Age group are Same.

Ha -> Difference exists in Mean Purchase for All Age group.

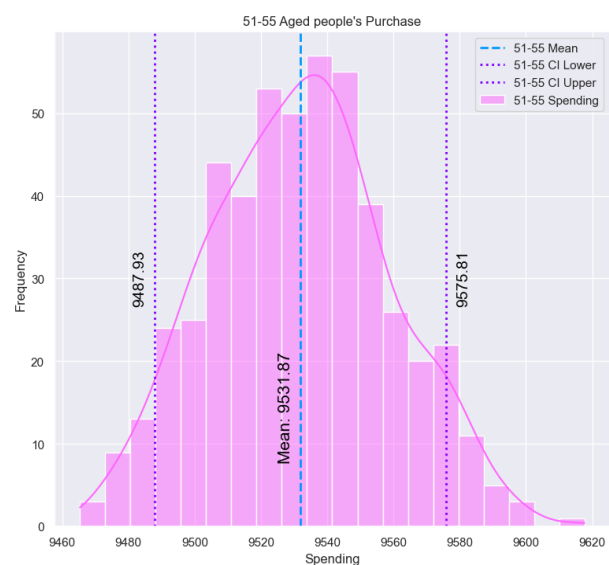
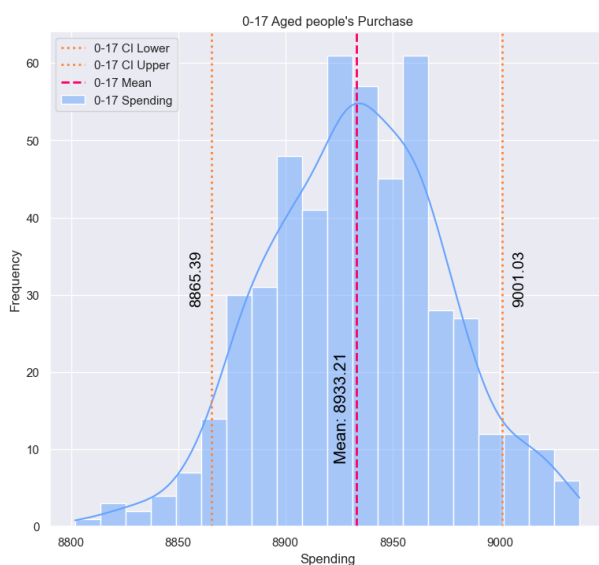
Samples size = 500

```
f_oneway(df_0_17, df_18_25, df_26_35, df_36_45, df_46_50, df_51_55, df_55)
```

p\_value = 1.053563939251671e-49

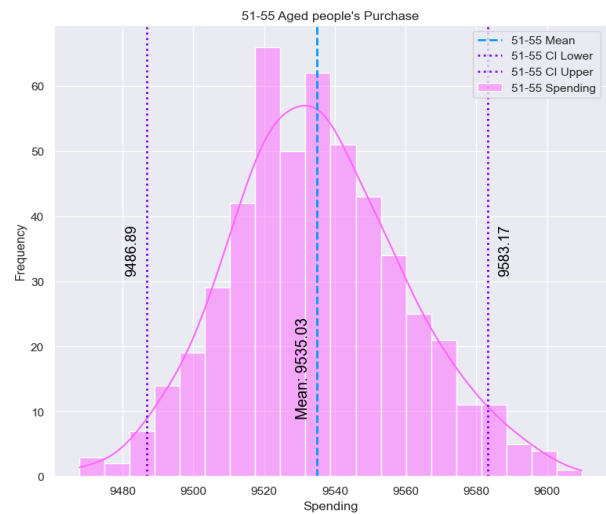
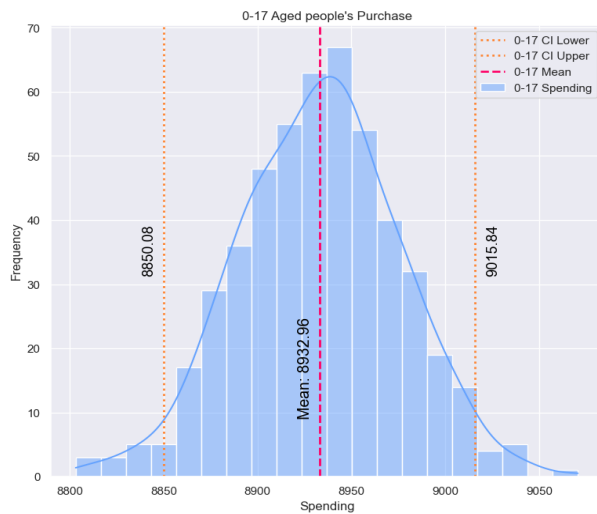
## With 90% Confidence Interval

Walmart Aged vs Purchase at 90% Confidence Interval



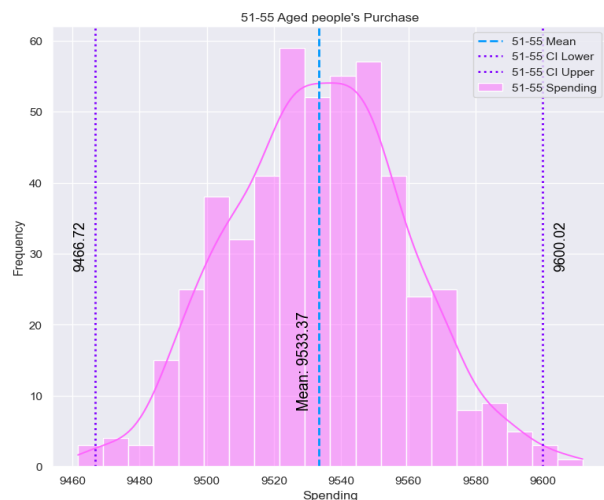
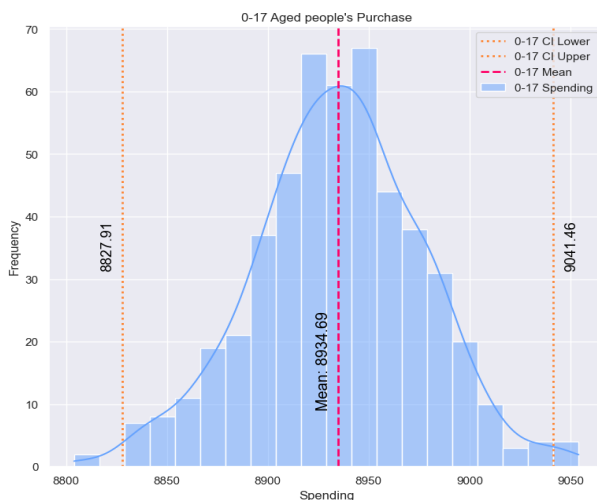
## With 95% Confidence Interval

Walmart Aged vs Purchase at 95% Confidence Interval



## With 99% Confidence Interval

Walmart Aged vs Purchase at 99% Confidence Interval



## Insights

Ho -> Mean Purchase for All Age group are Same.

Ha -> Difference exists in Mean Purchase for All Age group.

Using Anov Test p\_value for All Age Group found as 1.053563939251671e-47%.

- With Confidence interval of **90%** & Sample Size of **500**
  - Mean Purchase by 0-17 is **8934.92** with an Intervals of (8868.91 - 9000.92).
  - Mean Purchase by 51-55 is **9534.35** with an Intervals of (9491.49 - 9577.22).
  - As 1.053563939251671e-47% < 10% Thus Rejecting Ho and Accepting Ha.
- With Confidence interval of **95%** & Sample Size of **500**
  - Mean Purchase by 0-17 is **9532.25** with an Intervals of (8848.87 - 9015.63).
  - Mean Purchase by 51-55 is **9534.85** with an Intervals of (9483.29 - 9586.40).
  - As 1.053563939251671e-47% < 10% Thus Rejecting Ho and Accepting Ha.

- With Confidence interval of 99% & Sample Size of 500
  - Mean Purchase by 0-17 is 8933.75 with an Intervals of (8827.73 - 9039.77).
  - Mean Purchase by 51-55 is 9535.59 with an Intervals of (9469.34 - 9601.84).
  - As  $1.053563939251671e-47\% < 10\%$  Thus Rejecting  $H_0$  and Accepting  $H_a$ .

No, there is no Overlapping between 0-17 & 51-55.