**Question 7.** Suppose you are given $100 to spend on advertising for this company. How would you spend it? Explain and interpret any additional analyses you want to do, and provide a detailed description of why you used the analyses you did. This portion should involve significant thought, perhaps partially based on the types of analysis you did earlier. (Hint: It may help to consider each social media platform separately.)
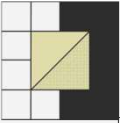
DSCC 462 Final Project

Presented by:

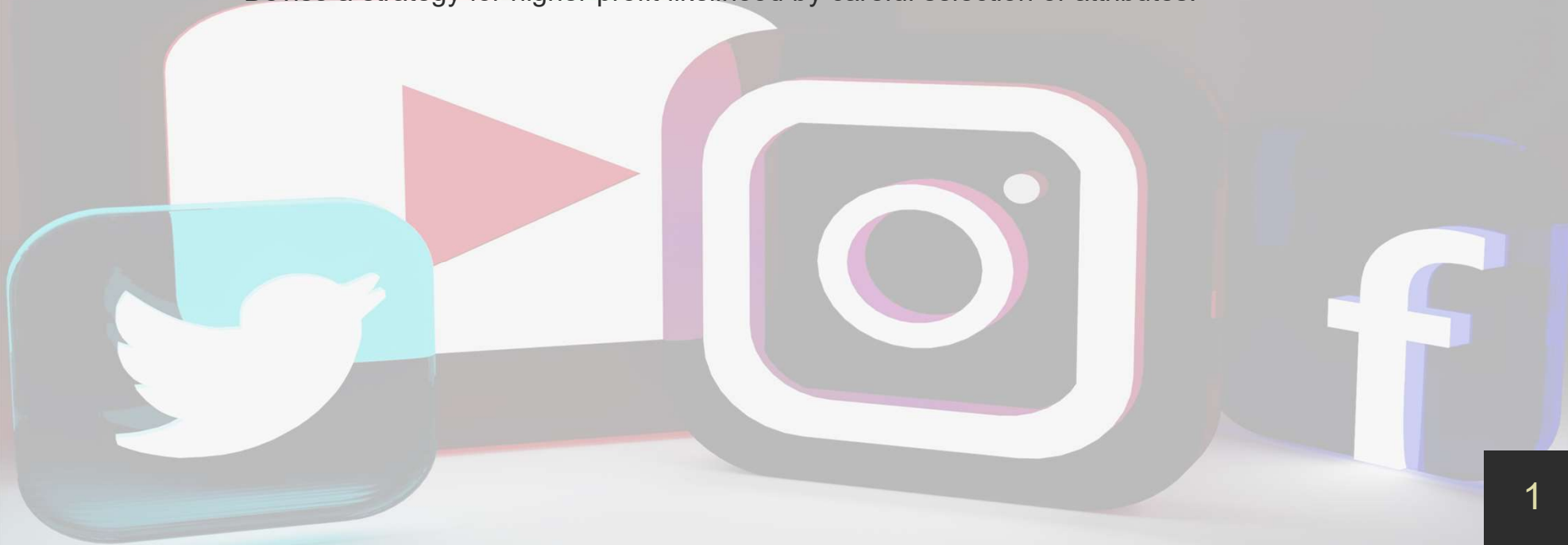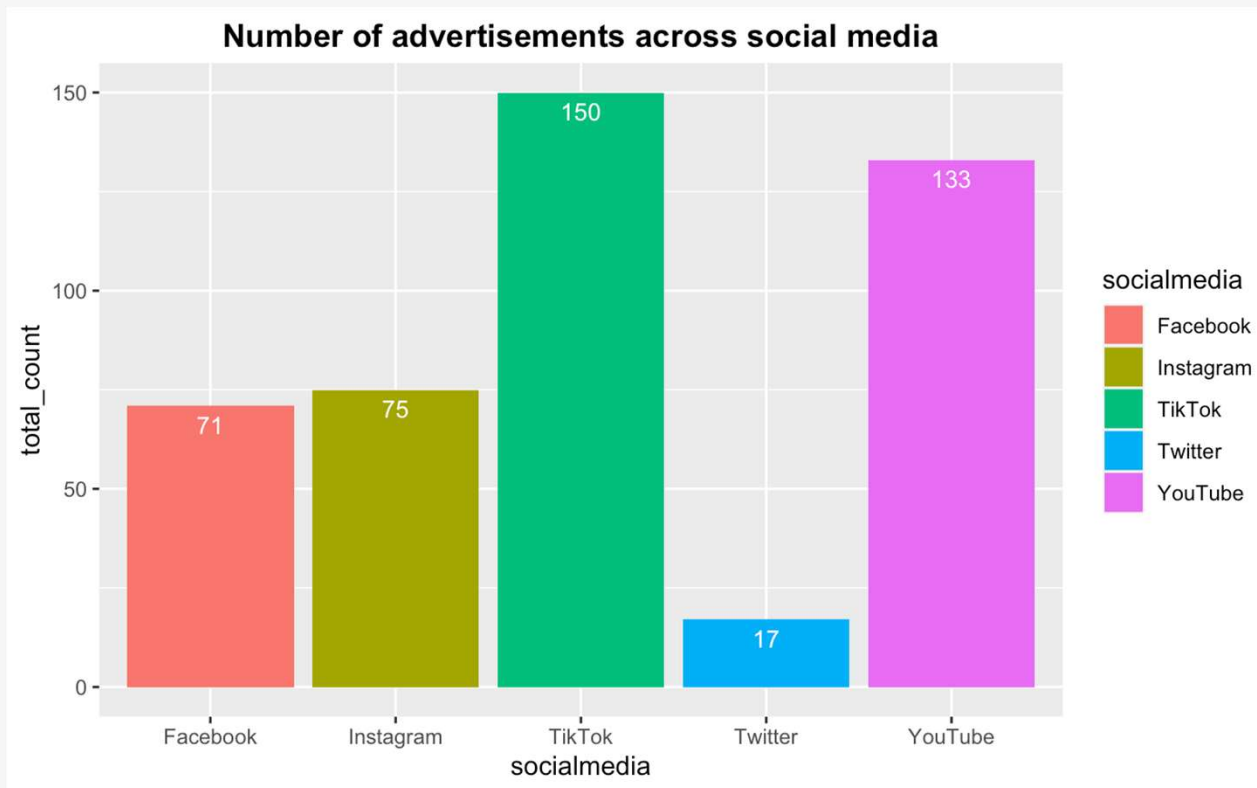Team 4 - Rishabh Kandoi, Ayush Singla, Aradhya Mathur, Richa Yadav

Problem Statement

Given historical data,
- Perform EDA to understand the relationship among variables and their impact on profit.
- Devise a strategy for higher profit likelihood by careful selection of attributes.
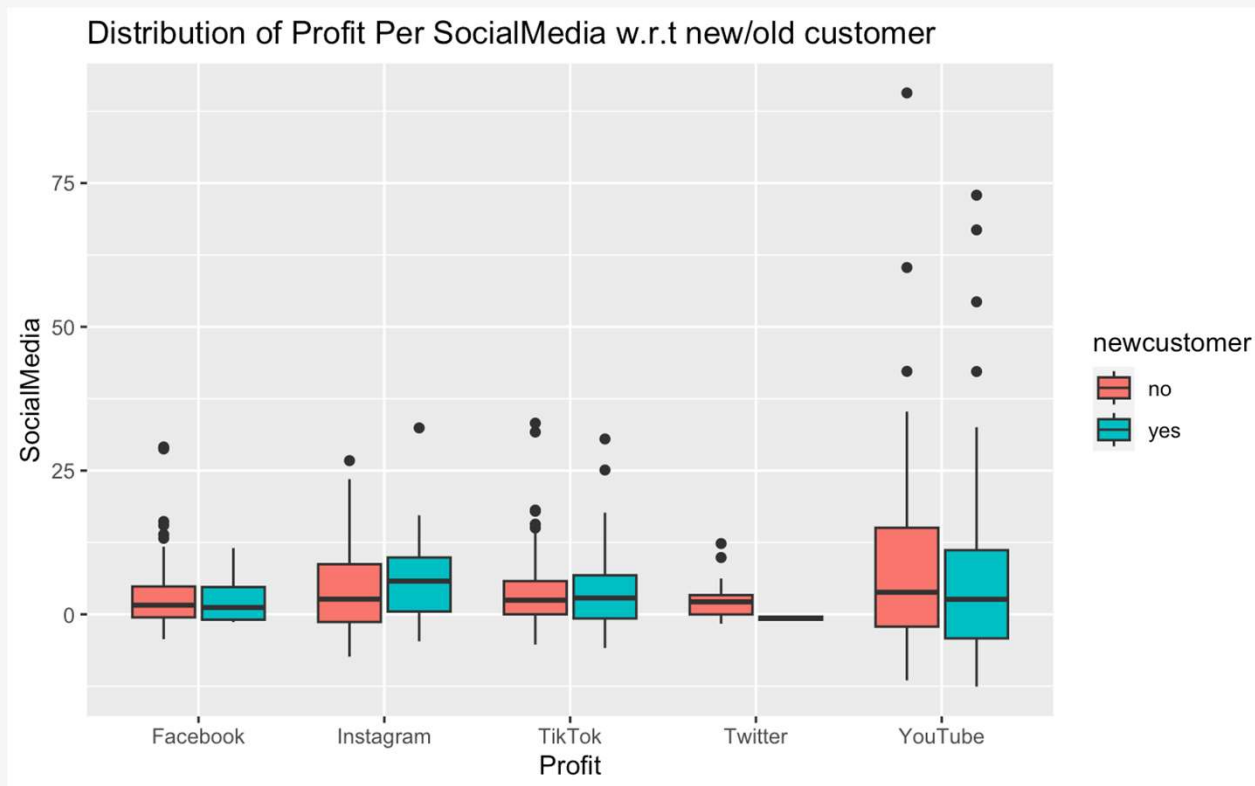
Comparison of platforms

Number of advertisements across social media

- TikTok and YouTube together account for 60% of the total Ads running across all platforms.
- While Twitter accounts for just 4% of the entire distribution running across all platforms.

Profit across platforms w.r.t customer type

Distribution of Profit Per SocialMedia w.r.t new/old customer

- Clearly, YouTube records the highest profits across both new and old customers.

Impact of season on profit

```
        Pairwise comparisons using t tests with pooled SD

data:   data$Profit and data$season

        fall spring summer
spring 1.00 -      -
summer 1.00 1.00   -
winter 1.00 1.00   0.87

P value adjustment method: bonferroni

  Posthoc multiple comparisons of means: Scheffe Test
    95% family-wise confidence level

$g
                  diff      lwr.ci    upr.ci    pval
spring-fall   -1.0331162 -5.483518 3.417285 0.9351
summer-fall   -1.8550271 -5.952206 2.242152 0.6564
winter-fall    0.1943167 -3.992805 4.381439 0.9994
summer-spring -0.8219109 -5.040606 3.396784 0.9602
winter-spring  1.2274329 -3.078668 5.533534 0.8872
winter-summer  2.0493438 -1.890619 5.989306 0.5463

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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```
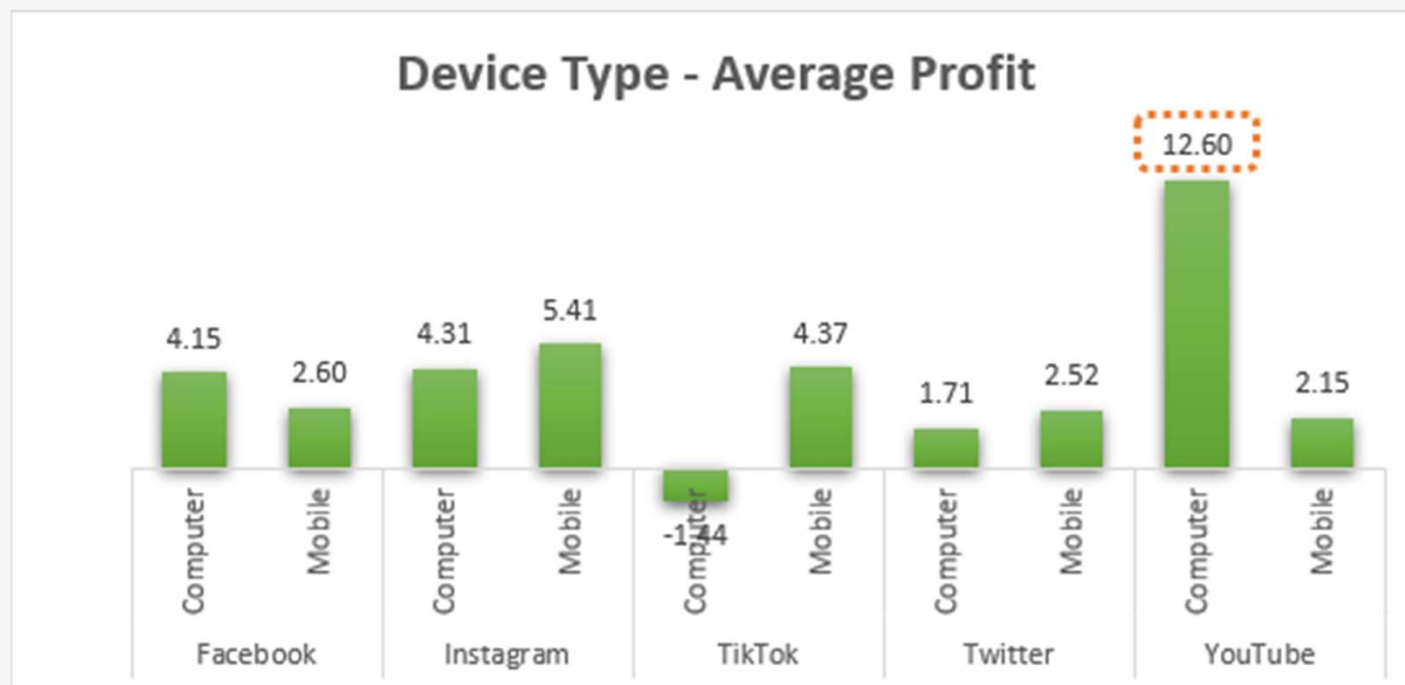
- According to the pairwise T-test using Bonferroni and Scheffe methods, All of the season pairs have equal average profit.
- Thus, the choice of the season period doesn't significantly impact profit.

Impact of device type on profit


Device Type - Average Profit

- Overall average profit for Computer devices Is greater than for Mobilephones.
- This is mostly driven by YouTube users (16%) generating maximum profit i.e. 12.6.
- For our use case, given an investment, there is no control in the selection of device type for the target user.

Impact of age and Ad cost on profit

- The correlation between Age Vs. Profit and Ad Cost Vs. Profit are insignificant.
- According to the linear regression analysis shown beside, neither Ad cost nor Ad cost + age impact profit.
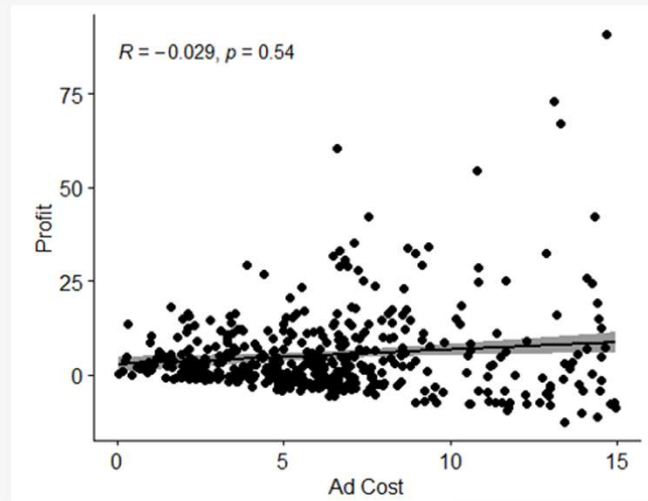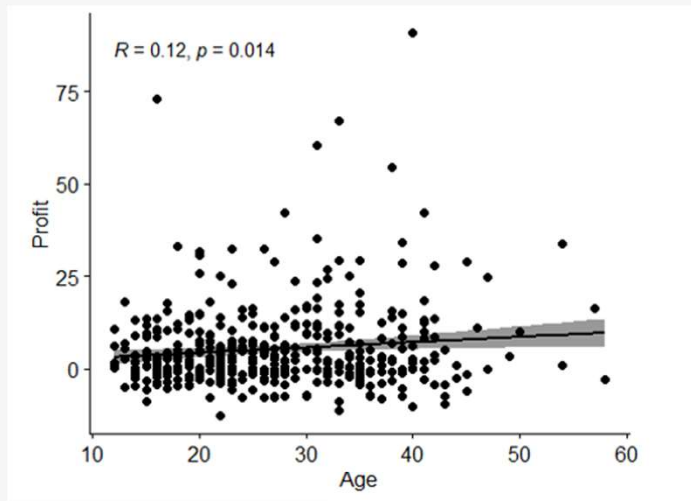
```
##
## Call:
## lm(formula = profit ~ adcost + age, data = dataset)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -19.935  -6.077  -2.018   3.207  81.408
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.45097    1.68225   0.268   0.7888
## adcost       0.31223    0.15390   2.029   0.0431 *
## age          0.10610    0.06043   1.756   0.0798 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.98 on 443 degrees of freedom
## Multiple R-squared:  0.02259,    Adjusted R-squared:  0.01817
## F-statistic: 5.119 on 2 and 443 DF,  p-value: 0.006343
```

5
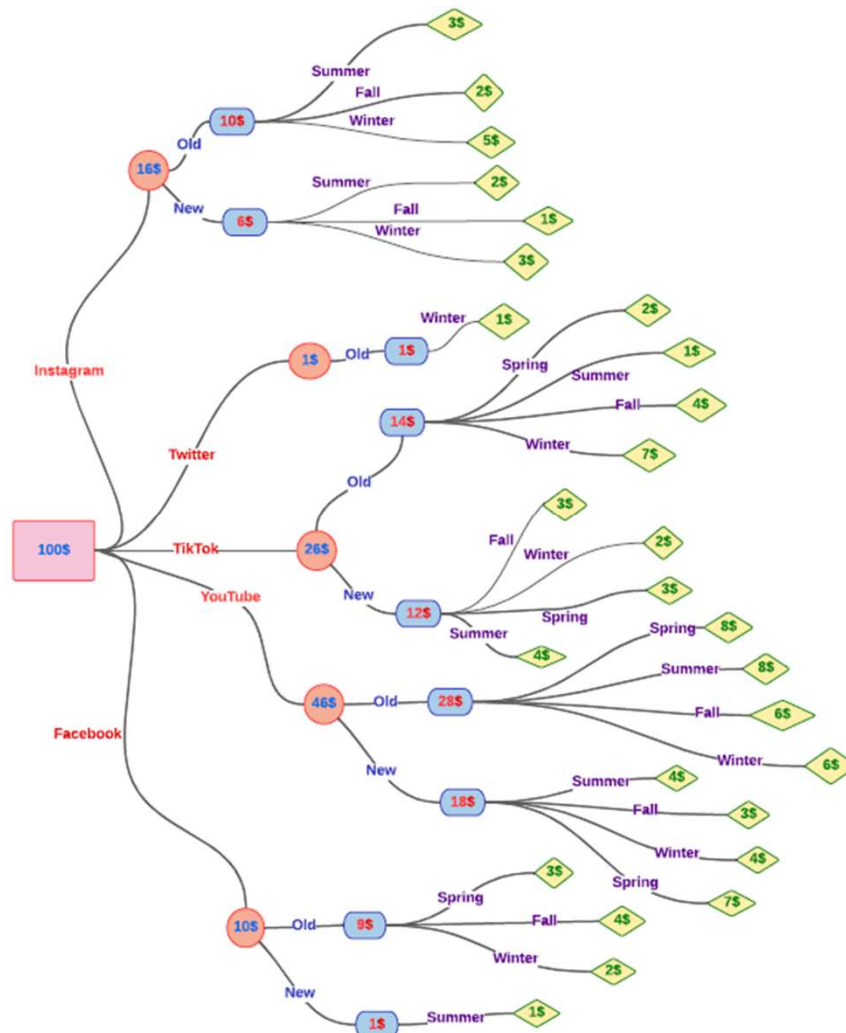
Cost Distribution

- To conclude, we recommend investing more in YouTube and TikTok, especially focusing on existing customer engagement.