Assignment #3: Quality Alloys, Inc. – 1

(Due: TUESDAY 6/4 at 12PM)

(Accompanying Files: WeeklyVisits.RData, Financials.RData, DailyVisits.RData, t-test exercise)

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Read the Quality Alloys, Inc. case for Assignment #2. (Now, it’s time to buy a case from HBR(Harvard Business Review). Access to the HBR website, <https://hbr.org/store/case-studies>, and find and buy a case, “Web Analytics at Quality Alloys (CU44-PDF-ENG)”.) [이 HBR 케이스를 직접 사실 필요는 없습니다. 다만 이 케이스를 읽으면, 실제 이 데이터가 적용되는 실제 사례를 더욱 잘 이해할 수 있습니다. 이 숙제는 HBR 케이스를 읽지 않아도 기술통계량 분석을 할 수 있습니다.] In this assignment, you will do exploratory data analyses to understand the effectiveness of QA’s promotional effort by answering the following questions. Write your answers in this document and submit by the due. When you submit your answers, submit also your R scripts for Q1.

1. Using data, “WeeklyVisits.csv” and “Financial.csv”, calculate the following summary statistics for visits, unique visits, revenue, profit, and pounds sold: mean, median, standard deviation, minimum, and maximum, for the initial, pre-promotion, promotion, and post-promotion periods. So, for each period you should provide 25 values: five summary measures for each of five variables. Name your R script 1.R and submit it with your answer.

Hint: The R function you are to use is aggregate(). For example to compute the average visits of the four periods, you can type aggregate(WeeklyVisits$Visits, by = list(WeeklyVisits$Period), mean, na.rm = T). You should change the arguments WeeklyVisits$Visits and mean appropriately to calculate other summary statistics for the remaining variables.

Initial Period

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Visits | Unique Visits | Revenue | Profit | Lbs. Sold |
| Mean | 1088.23 |  |  |  |  |
| Median |  |  |  |  |  |
| St. Dev |  |  |  |  |  |
| Minimum |  |  |  |  |  |
| Maximum |  |  |  |  |  |

Pre-Promotion Period

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Visits | Unique Visits | Revenue | Profit | Lbs. Sold |
| Mean | 565.818 |  |  |  |  |
| Median |  |  |  |  |  |
| St. Dev |  |  |  |  |  |
| Minimum |  |  |  |  |  |
| Maximum |  |  |  |  |  |

Promotion Period

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Visits | Unique Visits | Revenue | Profit | Lbs. Sold |
| Mean | 1853.312 |  |  |  |  |
| Median |  |  |  |  |  |
| St. Dev |  |  |  |  |  |
| Minimum |  |  |  |  |  |
| Maximum |  |  |  |  |  |

Post-Promotion Period

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Visits | Unique Visits | Revenue | Profit | Lbs. Sold |
| Mean | 878.867 |  |  |  |  |
| Median |  |  |  |  |  |
| St. Dev |  |  |  |  |  |
| Minimum |  |  |  |  |  |
| Maximum |  |  |  |  |  |

2. Now we want to create histograms of daily visits.

2.1. Create a histogram of Visits for the whole period. Draw the histogram below for the whole period.

2.2. Create histograms of Visits for the four periods separately. Draw the four histograms below.

Answer the following questions.

* Inspect the four period-specific histograms. Do you think that daily visits to QA website is similar across the four periods? Do you find a lot of variations of daily visits across the four periods?
* In which of the four periods is the visit most variable?
* How do you find supporting evidence from the histograms?
* Can you find consistent evidence from your answers to Q1? Which metric should you refer to?

3. Use "t-test exercise.xlsx".

* 1. "Ad study" data present pre-exposure and post-exposure attitude scores from an advertising study involving 10 respondents. Examine whether advertising increased the mean attitude score. Which test should we use: paired or independent sample t-test?
  2. You want to compare the prices by two supermarket chains—Miller’s and Albert’s. Using a standardized one-week shopping plan (grocery list), you made identical purchases at 10 of each chain stores. The stores are randomly selected and all purchases are made during a single week. Examine whether the mean weekly expense at Miller’s is different from that at and Albert’s. Which test should we use: paired or independent sample t-test?