Wacaha

Pricing and Retail Analytics

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1 Technical section

This is where your technical material should go. You might start by reading in the data.

1.1 Data setup

```
# Read in the data
df <- read_excel("small_salsa.xlsx")

# Create logged prices and quantities
df <- df %>%
  mutate(ln_p = log(price),
         ln_q = log(units),
         Dholiday = factor(holiday),
         Dstore = factor(store),
         Dzone= factor(zone))
```

1.2 Results of Launch Period

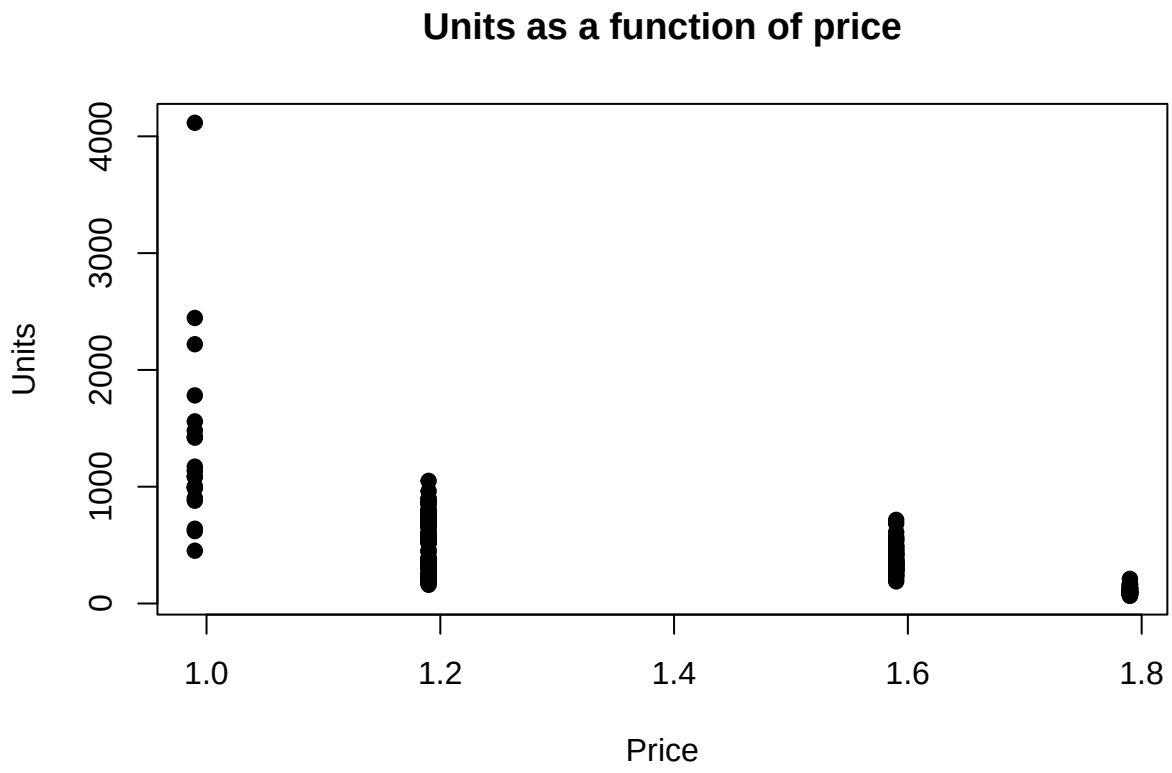
```
df %>%
  select(week,units,price,regprice)
```

```
# A tibble: 200 x 4
    week units price regprice
   <dbl> <dbl> <dbl>    <dbl>
 1     1   544  1.59     1.59
```

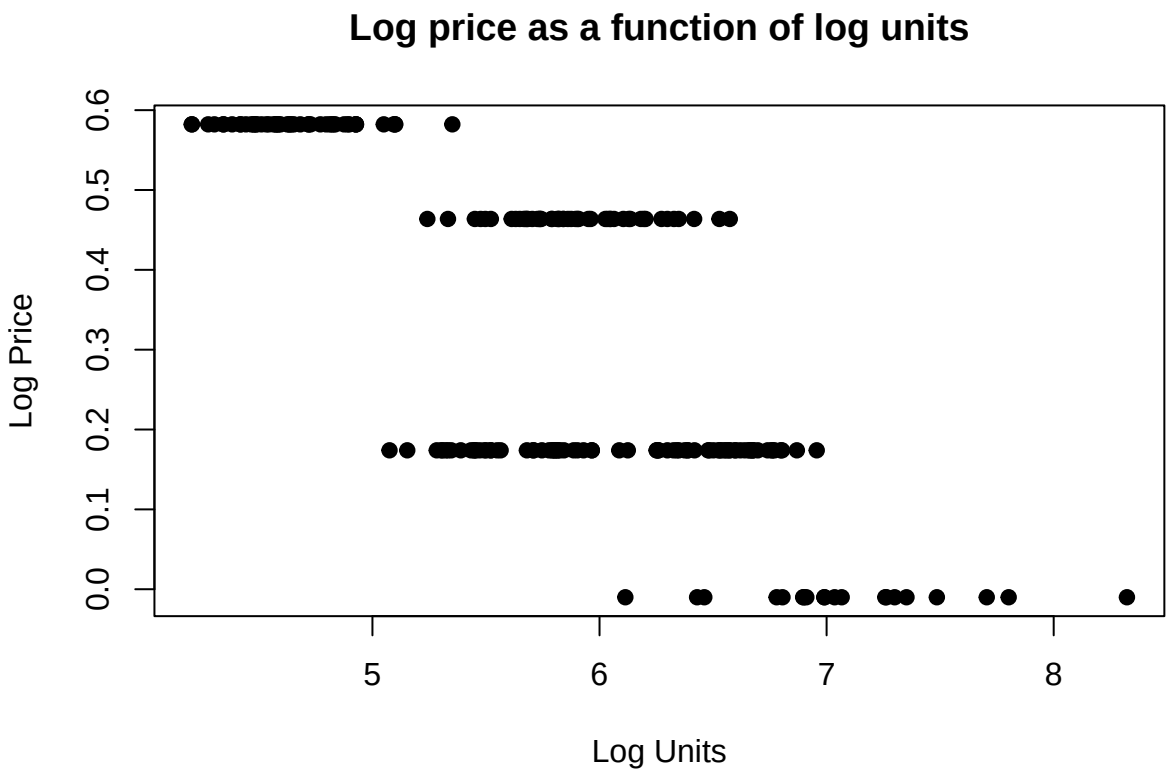
```
 2     1   300  1.59     1.59
 3     1   164  1.79     1.79
 4     1    83  1.79     1.79
 5     1    77  1.79     1.79
 6     1   418  1.59     1.59
 7     1    96  1.79     1.79
 8     1   612  1.59     1.59
 9     1   124  1.79     1.79
10     1   356  1.59     1.59
# ... with 190 more rows
```

1.3 Data Exploration

```
#plot price versus units
plot(df$price, df$units,main="Units as a function of price",xlab="Price",ylab="Units",pc
```




```
plot(df$ln_q,df$ln_p,main="Log price as a function of log units",xlab="Log Units",ylab="
```



1.4 Correlation

```
corr.test(df %>% select(price, pop, units, holiday))
```

```
Call:corr.test(x = df %>% select(price, pop, units, holiday))
Correlation matrix
        price   pop units holiday
price    1.00 -0.17 -0.61   -0.50
pop     -0.17  1.00  0.45    0.00
units   -0.61  0.45  1.00    0.67
holiday -0.50  0.00  0.67    1.00
Sample Size
[1] 200
Probability values (Entries above the diagonal are adjusted for multiple tests.)
        price  pop units holiday
price    0.00 0.03     0       0
pop      0.02 0.00     0       1
units    0.00 0.00     0       0
holiday  0.00 1.00     0       0
```

```
 To see confidence intervals of the correlations, print with the short=FALSE option
```

1.5 Regression

```
reg1 <- lm(ln_q ~ ln_p + Dzone + Dholiday, data=df)
summary(reg1)
```

```

Call:
lm(formula = ln_q ~ ln_p + Dzone + Dholiday, data = df)

Residuals:
     Min       1Q   Median       3Q      Max
-0.63263 -0.19428 -0.02146  0.18465  0.76698

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  6.96265    0.04703 148.058  < 2e-16 ***
ln_p        -2.34677    0.11293 -20.780  < 2e-16 ***
Dzone2      -0.92446    0.03835 -24.108  < 2e-16 ***
Dholiday1    0.56942    0.07604   7.489 2.32e-12 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.267 on 196 degrees of freedom
Multiple R-squared:  0.8998,    Adjusted R-squared:  0.8983
F-statistic: 586.9 on 3 and 196 DF,  p-value: < 2.2e-16
```

The regression indicates that the price elasticity is for the historical data is -2.347.

1.6 Regression No Holiday

```
reg.noholiday <- lm(ln_q ~ ln_p + Dstore, data=df %>% filter(Dholiday==0))
summary(reg.noholiday)
```

```

Call:
lm(formula = ln_q ~ ln_p + Dstore, data = df %>% filter(Dholiday ==
    0))

Residuals:
```

```
     Min       1Q   Median       3Q      Max
-0.57507 -0.14324 -0.01074  0.14713  0.62902

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  6.900657   0.083972  82.178  < 2e-16 ***
ln_p        -2.334447   0.098210 -23.770  < 2e-16 ***
Dstore2     -0.064622   0.109264  -0.591   0.5551
Dstore3     -0.670957   0.109455  -6.130 6.67e-09 ***
Dstore4     -0.818672   0.109455  -7.480 4.75e-12 ***
Dstore5     -1.157607   0.109455 -10.576  < 2e-16 ***
Dstore6      0.126562   0.109264   1.158   0.2485
Dstore7     -0.869427   0.109455  -7.943 3.38e-13 ***
Dstore8      0.243576   0.109264   2.229   0.0272 *
Dstore9     -0.762618   0.109455  -6.967 8.10e-11 ***
Dstore10    -0.023632   0.109264  -0.216   0.8290
Dstore11    -0.986811   0.109455  -9.016 5.95e-16 ***
Dstore12     0.219053   0.109264   2.005   0.0467 *
Dstore13     0.139019   0.109264   1.272   0.2051
Dstore14    -0.001275   0.109264  -0.012   0.9907
Dstore15    -0.788811   0.109455  -7.207 2.18e-11 ***
Dstore16    -1.053457   0.109455  -9.625  < 2e-16 ***
Dstore17    -0.833804   0.109455  -7.618 2.18e-12 ***
Dstore18    -0.847687   0.109455  -7.745 1.06e-12 ***
Dstore19    -0.101104   0.109264  -0.925   0.3562
Dstore20     0.156922   0.109264   1.436   0.1529
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2318 on 159 degrees of freedom
Multiple R-squared:  0.9115,    Adjusted R-squared:  0.9003
F-statistic: 81.85 on 20 and 159 DF,  p-value: < 2.2e-16
```

The regression indicates that the price elasticity is for the historical data is -2.334. This is a minor change to our original regression's price elasticity.

You could keep adding lines of code to the chunk above, or start a new chunk with additional analysis below.

```
# More code here
```

2 Managerial Discussion

Managerial discussion goes here.