# Mental Accounting in College: Students and 'Free Money'

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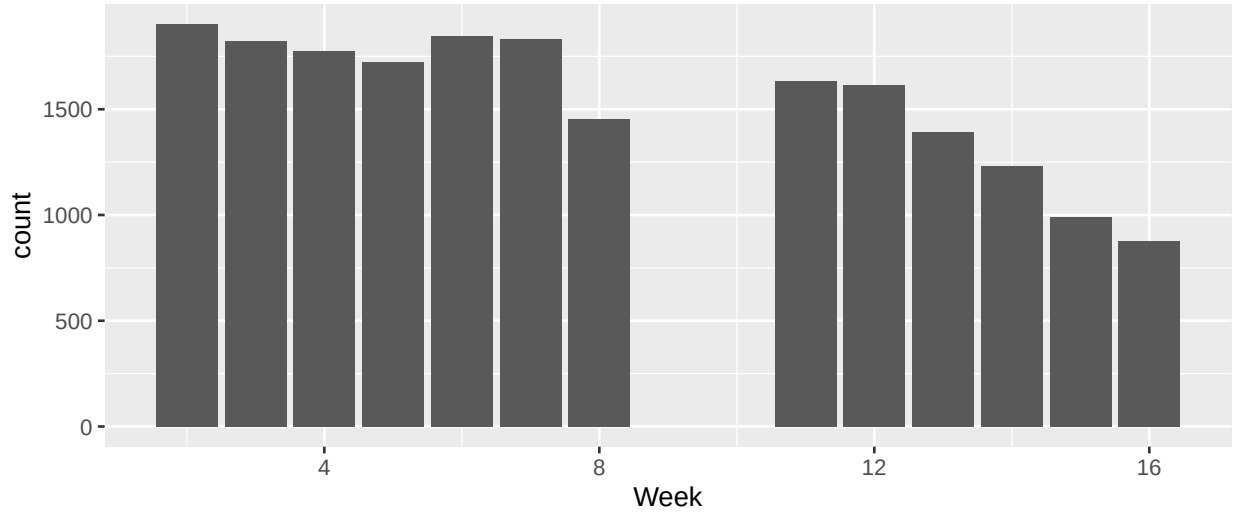
*April 2, 2020*

*Spring Semester Dates* Campus Open: 1/20/19, Start: 1/22/19, End: 5/8/19, Campus Closed: 5/20/19

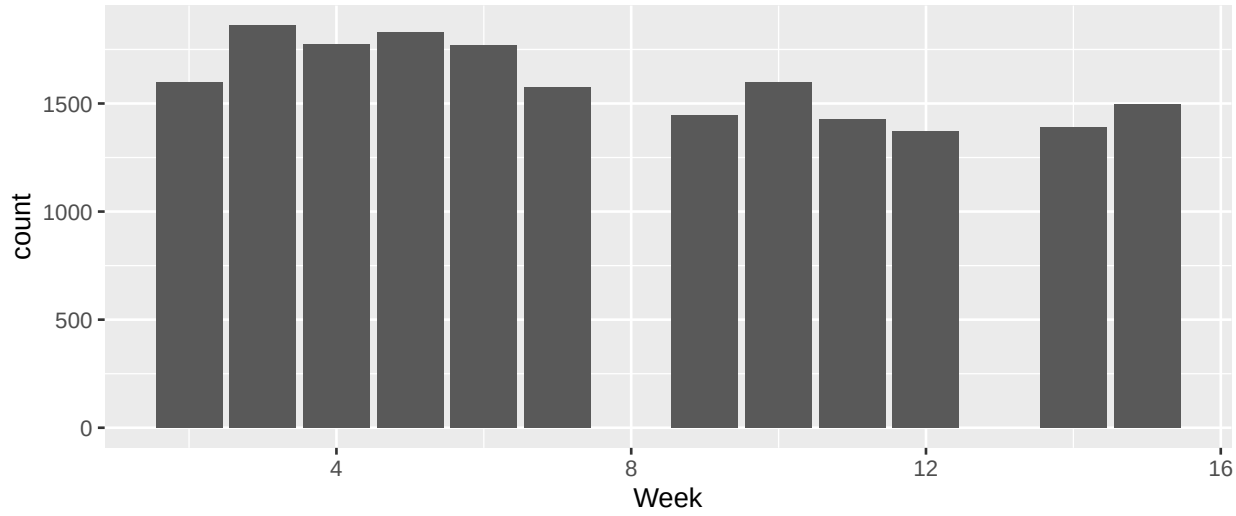
*Fall Semester Dates* Campus Open: 8/31/19 Start: 9/3/19, End: 12/11/19, Campus Closed: 12/21/19

```
flex_data <- read_csv("flex_data.csv")
flex_data <- flex_data %>% mutate(Time = mdy_hm(Time)) %>% mutate(Week = epiweek(Time)) %>% rename(Amou
flex_data <- flex_data %>% filter(Time >= '2019-01-20' & Time <= '2019-12-19') %>%  filter(AmountSpent
```

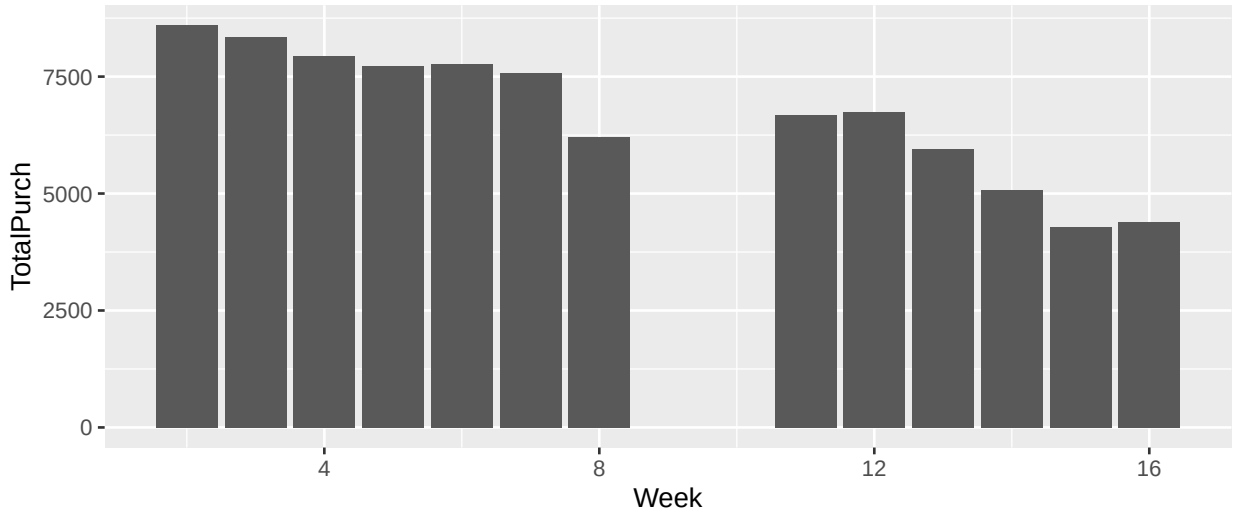
```
#Transactions by week
springtrans <- flex_data %>% filter(Time <= '2019-5-19') %>% mutate(Week = Week-3) %>% filter(Week!=1 &
falltrans <- flex_data %>% filter(Time >= '2019-9-1') %>% mutate (Week = Week-35) %>% filter(Week!=1 & W

ggplot(springtrans) + geom_bar(aes(x=Week))
```



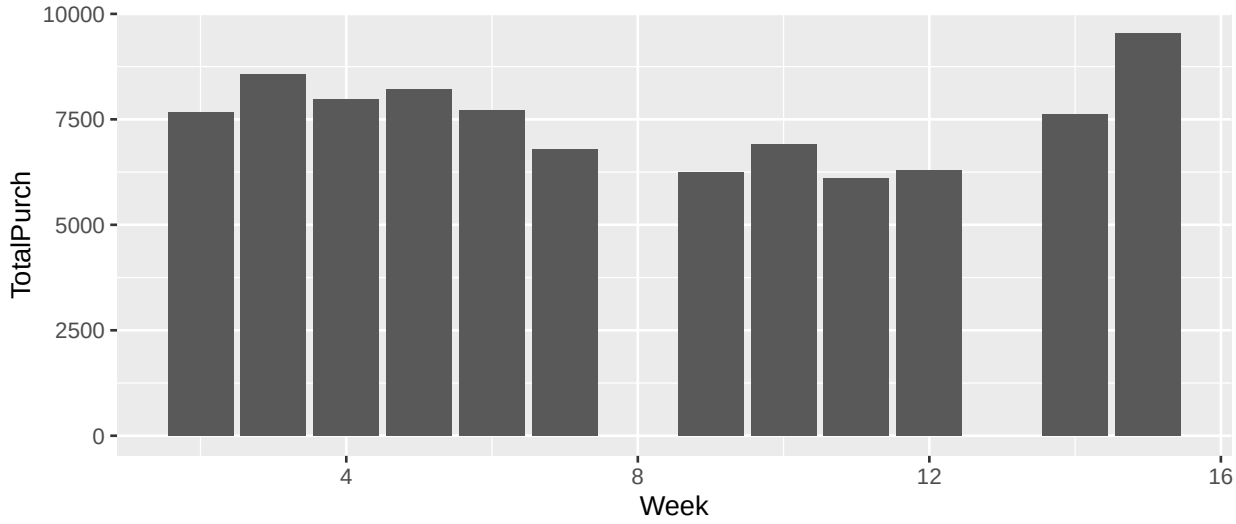

```
ggplot(falltrans) + geom_bar(aes(x=Week))
```



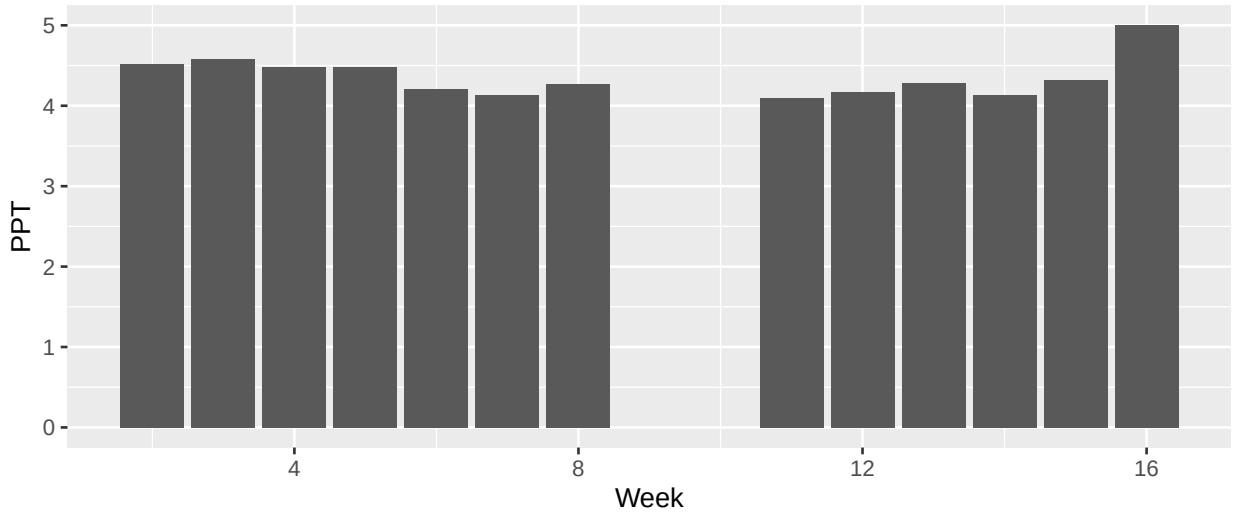

```
#Purchases by week
springpurch <- springtrans %>% group_by(Week) %>% summarize(TotalPurch = sum(AmountSpent))
fallpurch <- falltrans %>% group_by(Week) %>% summarize(TotalPurch = sum(AmountSpent))

ggplot(springpurch) + geom_bar(aes(x=Week, y=TotalPurch), stat='identity')
```



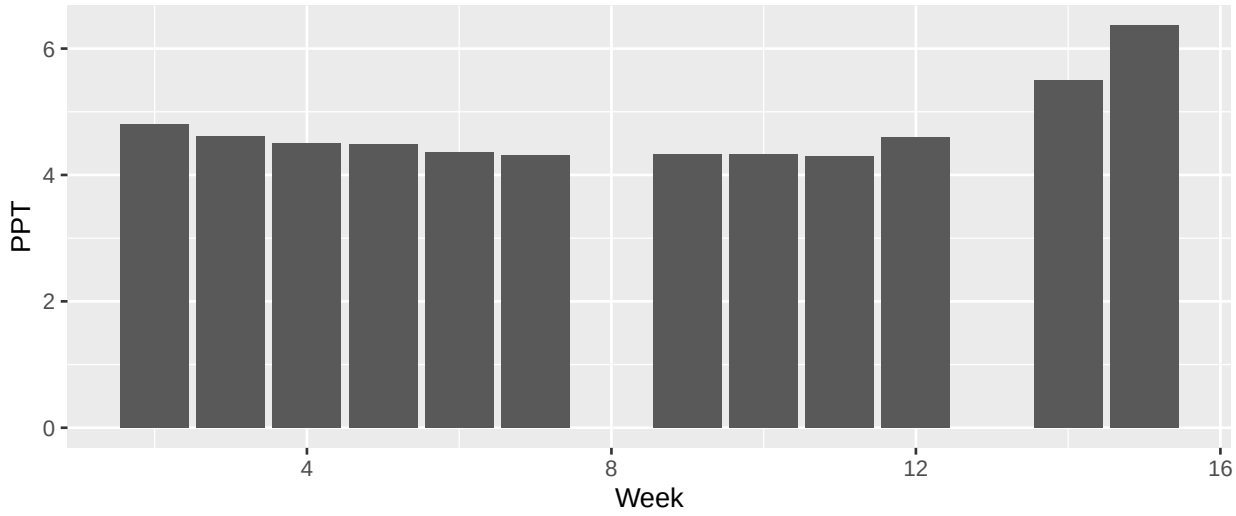

```
ggplot(fallpurch) + geom_bar(aes(x=Week, y=TotalPurch), stat='identity')
```




```
#Amount Spent Per Transaction
springppt <- springtrans %>% group_by(Week) %>% summarize(TotalTrans = n(), TotalPurch = sum(AmountSpen
fallppt <- falltrans %>% group_by(Week) %>% summarize(TotalTrans = n(), TotalPurch = sum(AmountSpent))

ggplot(springppt) + geom_bar(aes(x=Week, y=PPT), stat='identity')
```




```
ggplot(fallppt) + geom_bar(aes(x=Week, y=PPT), stat='identity')
```




```
#Creation of consistent null dataframes
#Tested - Sums of spring/fall consistent nulls add up to sum of purchases and transactions from spring/
sprnullconsistent <- data.frame("Week"=1:17, "Transactions"= c(0,sum(springppt$TotalTrans)/13,sum(sprin

fallnullconsistent <- data.frame("Week"=1:16, "Transactions"= c(0,sum(fallppt$TotalTrans)/12,sum(fallpp
```

```
#285/518=55.02% of students believe they spend consistently (1/3 beginning, 1/3 middle, 1/3 end)
#86/518=16.60% of students believe they spend most in beginning (1/2 beginning, 1/3 middle, 1/6 end)
#147/518=28.38% of students believe they spend most at end (1/6 beginning, 1/3 middle, 1/2 end)

#Tested - Sums of spring/fall weighted expectation nulls add up to sum of purchases/transactions from s
#Note - each period represents total spending expected during that period, then divided by number of we

p1springtrans <- (.5502*sum(springppt$TotalTrans)*(1/3) + .1660*sum(springppt$TotalTrans)*(1/2) + .2838
p2springtrans <- (.5502*sum(springppt$TotalTrans)*(1/3) + .1660*sum(springppt$TotalTrans)*(1/3) + .2838
p3springtrans <- (.5502*sum(springppt$TotalTrans)*(1/3) + .1660*sum(springppt$TotalTrans)*(1/6) + .2838

p1springtrans+p2springtrans+p3springtrans
```

```
## [1] 20091
```

```
sum(springppt$TotalTrans)
```

```
## [1] 20091
```

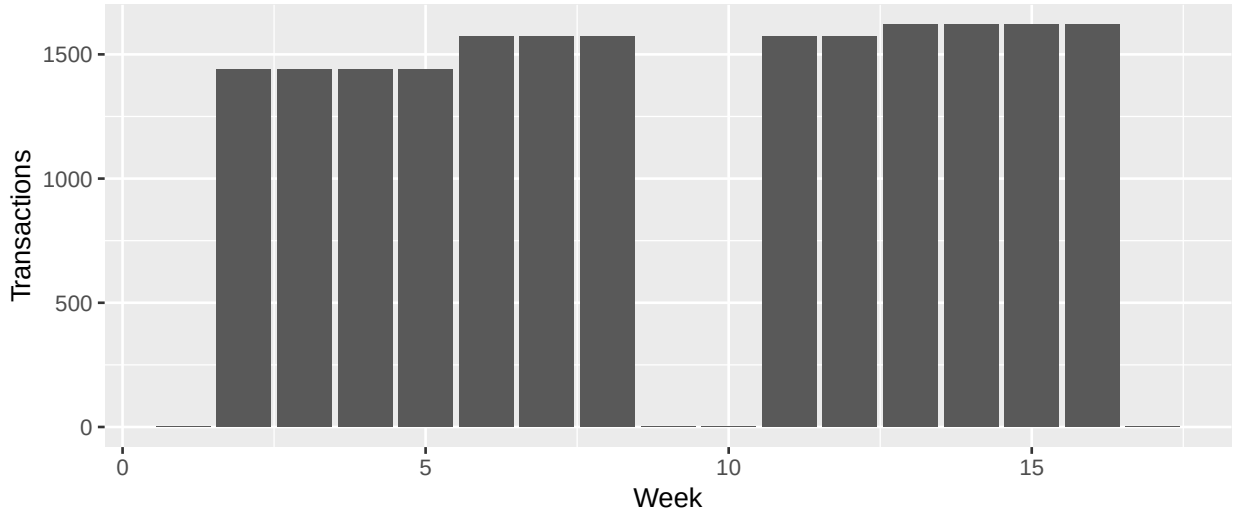
```
p1springpurch <- (.5502*sum(springppt$TotalPurch)*(1/3) + .1660*sum(springppt$TotalPurch)*(1/2) + .2838
p2springpurch <- (.5502*sum(springppt$TotalPurch)*(1/3) + .1660*sum(springppt$TotalPurch)*(1/3) + .2838
p3springpurch <- (.5502*sum(springppt$TotalPurch)*(1/3) + .1660*sum(springppt$TotalPurch)*(1/6) + .2838

p1springpurch+p2springpurch+p3springpurch
```

```
## [1] 87299.94
```

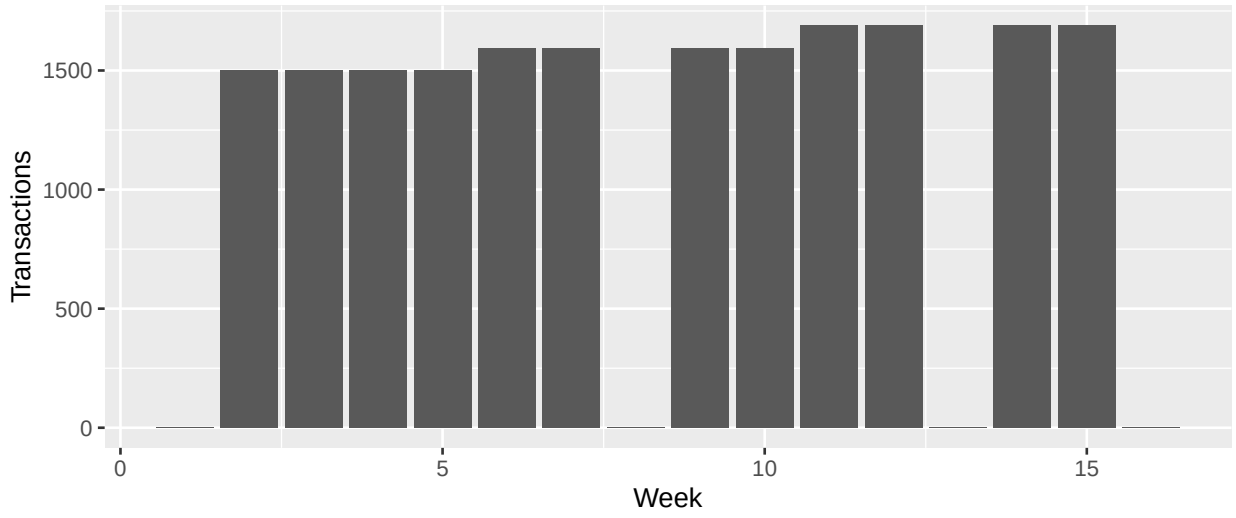
```r
sum(springppt$TotalPurch)
```

```
## [1] 87299.94
```

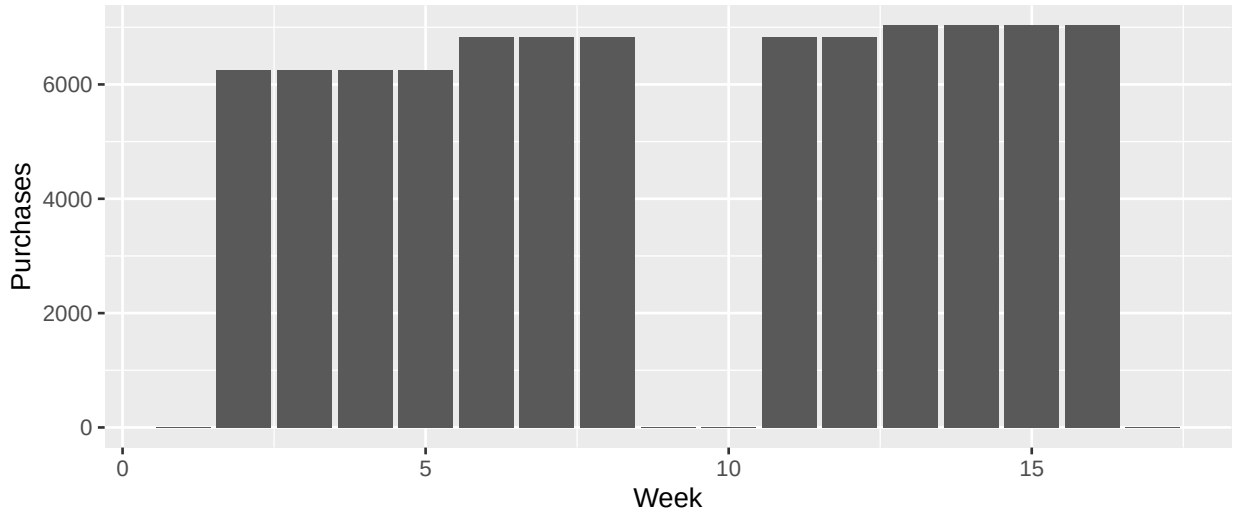
```r
sprnullweighted <- data.frame("Week"=1:17,
"Transactions"= c(0,p1springtrans/4,p1springtrans/4,p1springtrans/4,p1springtrans/4,p2springtrans/5,p2sp
"Purchases"= c(0,p1springpurch/4,p1springpurch/4,p1springpurch/4,p1springpurch/4,p2springpurch/5,p2spri

p1falltrans <- .5502*sum(fallppt$TotalTrans)*(1/3) + .1660*sum(fallppt$TotalTrans)*(1/2) + .2838*sum(fa
p2falltrans <- .5502*sum(fallppt$TotalTrans)*(1/3) + .1660*sum(fallppt$TotalTrans)*(1/3) + .2838*sum(fa
p3falltrans <- .5502*sum(fallppt$TotalTrans)*(1/3) + .1660*sum(fallppt$TotalTrans)*(1/6) + .2838*sum(fa

p1fallpurch <- .5502*sum(fallppt$TotalPurch)*(1/3) + .1660*sum(fallppt$TotalPurch)*(1/2) + .2838*sum(fa
p2fallpurch <- .5502*sum(fallppt$TotalPurch)*(1/3) + .1660*sum(fallppt$TotalPurch)*(1/3) + .2838*sum(fa
p3fallpurch <- .5502*sum(fallppt$TotalPurch)*(1/3) + .1660*sum(fallppt$TotalPurch)*(1/6) + .2838*sum(fa

fallnullweighted <- data.frame("Week"=1:16,
"Transactions"= c(0,p1falltrans/4,p1falltrans/4,p1falltrans/4,p1falltrans/4,p2falltrans/4,p2falltrans/4
"Purchases"= c(0,p1fallpurch/4,p1fallpurch/4,p1fallpurch/4,p1fallpurch/4,p2fallpurch/4,p2fallpurch/4,0,p

ggplot(sprnullweighted) + geom_bar(aes(x=Week, y=Transactions), stat='identity')
```



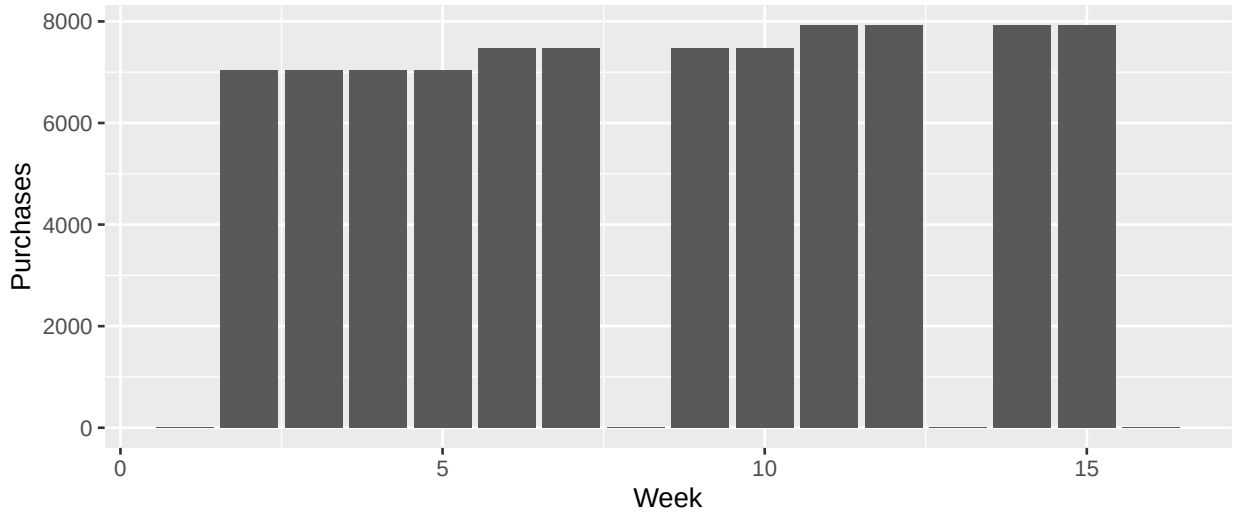

```r
ggplot(fallnullweighted) + geom_bar(aes(x=Week, y=Transactions), stat='identity')
```




```
ggplot(sprnullweighted) + geom_bar(aes(x=Week, y=Purchases), stat='identity')
```




```
ggplot(fallnullweighted) + geom_bar(aes(x=Week, y=Purchases), stat='identity')
```




Chi Squared Models

```
#Two Nulls Against One Another
```