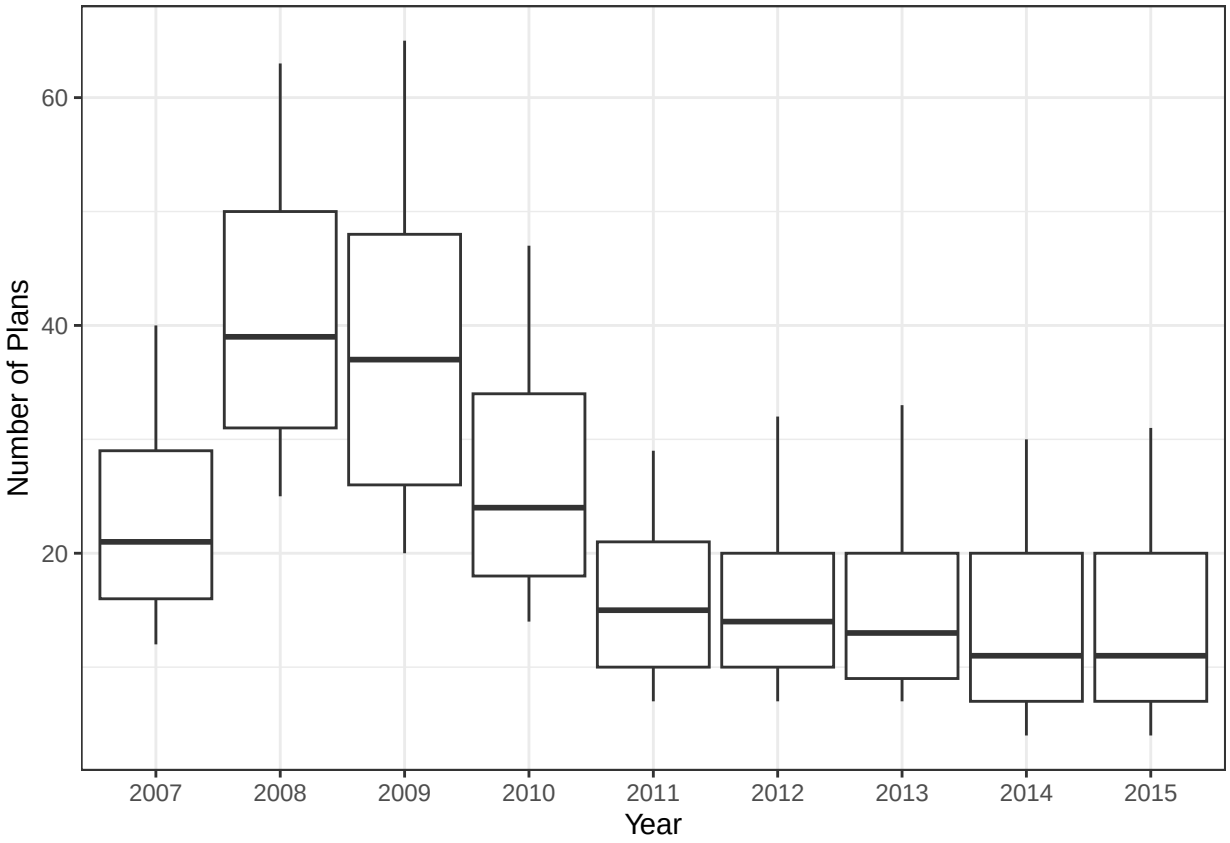
Bhasin-S-hwk4-2

Sachi Bhasin

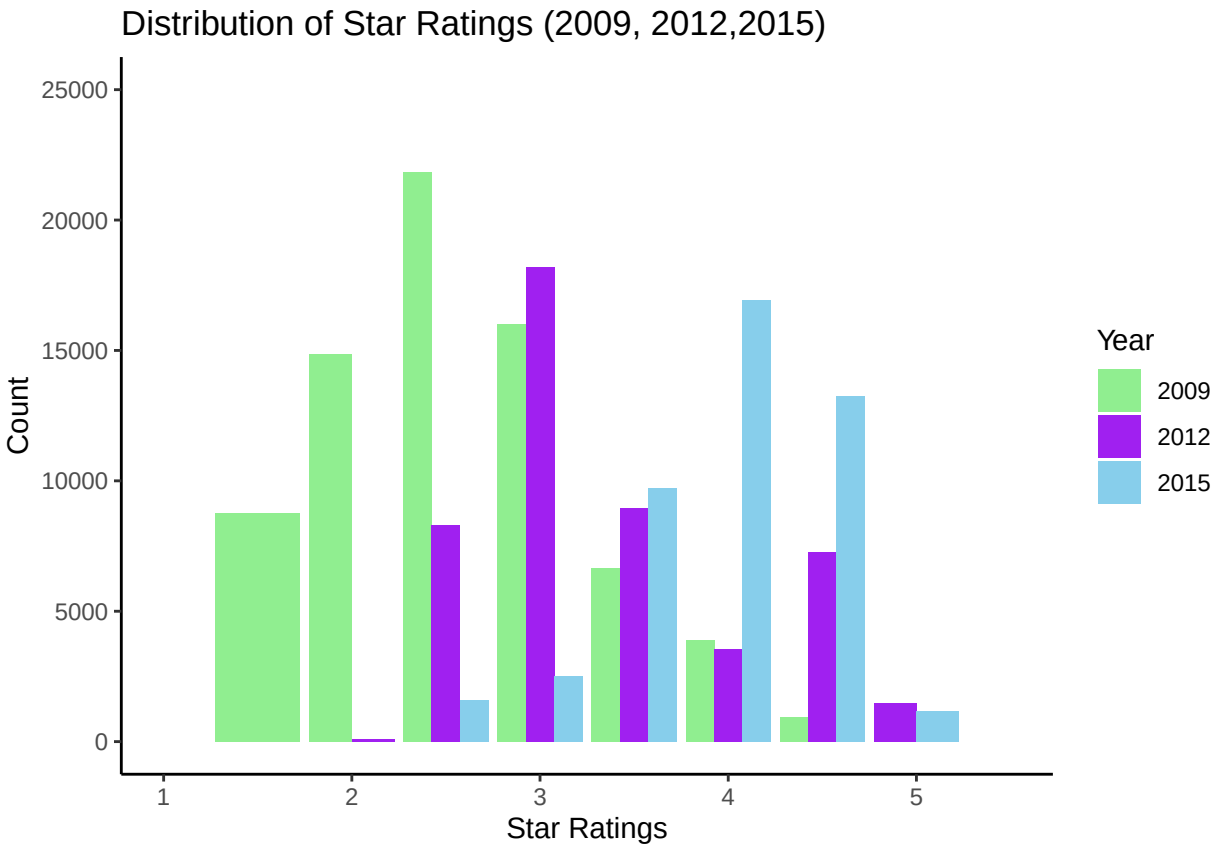
2023-04-05

Question 1



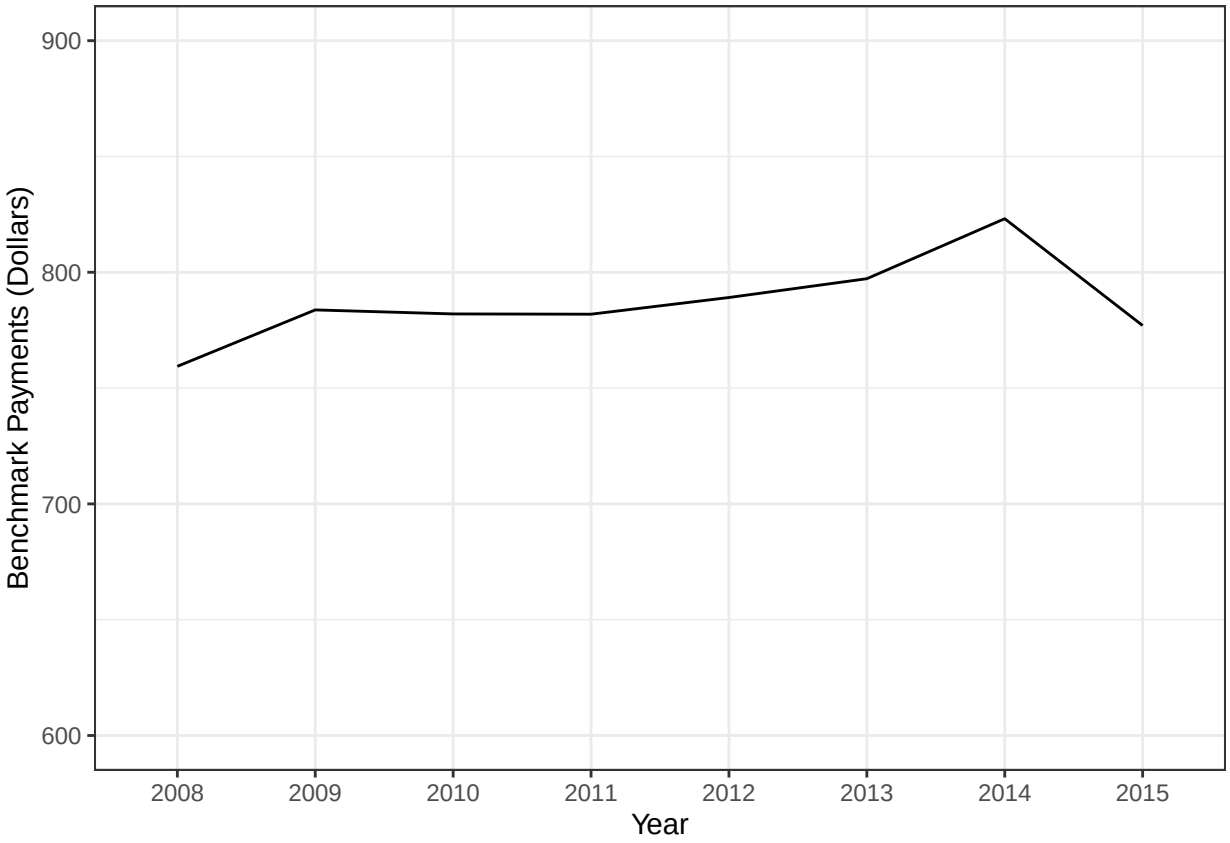
I think that the number of plans is too many. In 2009, the average number of plans in a county was almost 40. I think the average number of plans should be around 8, which was not the case for any of the years from 2007 to 2015.

Question 2



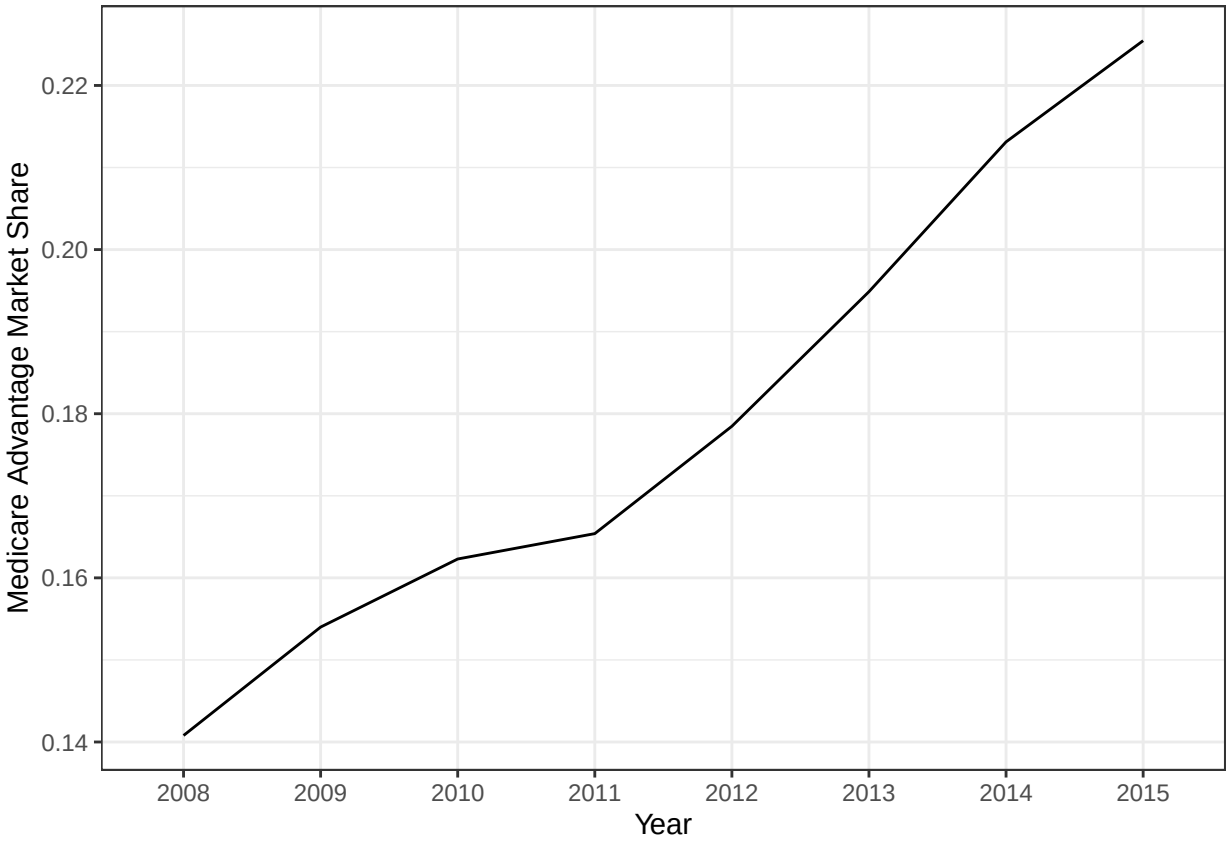
The star ratings have increased overtime. Especially after 2012, when the ACA was introduced, there has been a shift. The overall highest star ratings were seen in 2015, then 2012, and 2009 has the lowest overall star ratings.

Question 3



The average benchmark payment has risen by about 60 dollars from 2008 to 2014. It then drops from 2014 to 2015 by about 40 dollars.

Question 4



Medicare Advantage has increased in popularity over the years. This share correlates with benchmarks for the most part until 2014. From 2014 to 2015, the benchmark decreases but the average share of medicare advantage continues to increase.

Question 5

```
##
##   1.5     2   2.5     3   3.5     4   4.5
##     6   609  6928 12004  4604  3023   937
```

Question 6

```
## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
## Number of Obs.                16619         9595
## Eff. Number of Obs.            4678         1735
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.125        0.125
## BW bias (b)                   0.125        0.125
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
## ===============================================================================
##   Conventional     0.006     0.002     3.836     0.000     [0.003 , 0.009]
##         Robust         -         -     4.812     0.000     [0.032 , 0.076]
## ===============================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
## Number of Obs.                21142         5072
## Eff. Number of Obs.            1197         1042
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.125        0.125
## BW bias (b)                   0.125        0.125
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
## ===============================================================================
##   Conventional     0.003     0.002     1.185     0.236    [-0.002 , 0.007]
##         Robust         -         -     6.268     0.000     [0.015 , 0.028]
## ===============================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
```

```
## Number of Obs.                24795         1419
## Eff. Number of Obs.             982          681
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.125        0.125
## BW bias (b)                   0.125        0.125
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
## ===============================================================================
##   Conventional     0.002     0.002     1.006     0.315    [-0.002 , 0.006]
##         Robust         -         -    -5.312     0.000    [-0.028 , -0.013]
## ===============================================================================
```

*I tried to create a joint table using modelsummary but kept getting an error message since it could not "extract the required information from a model of class"rdrobust"

Question 7

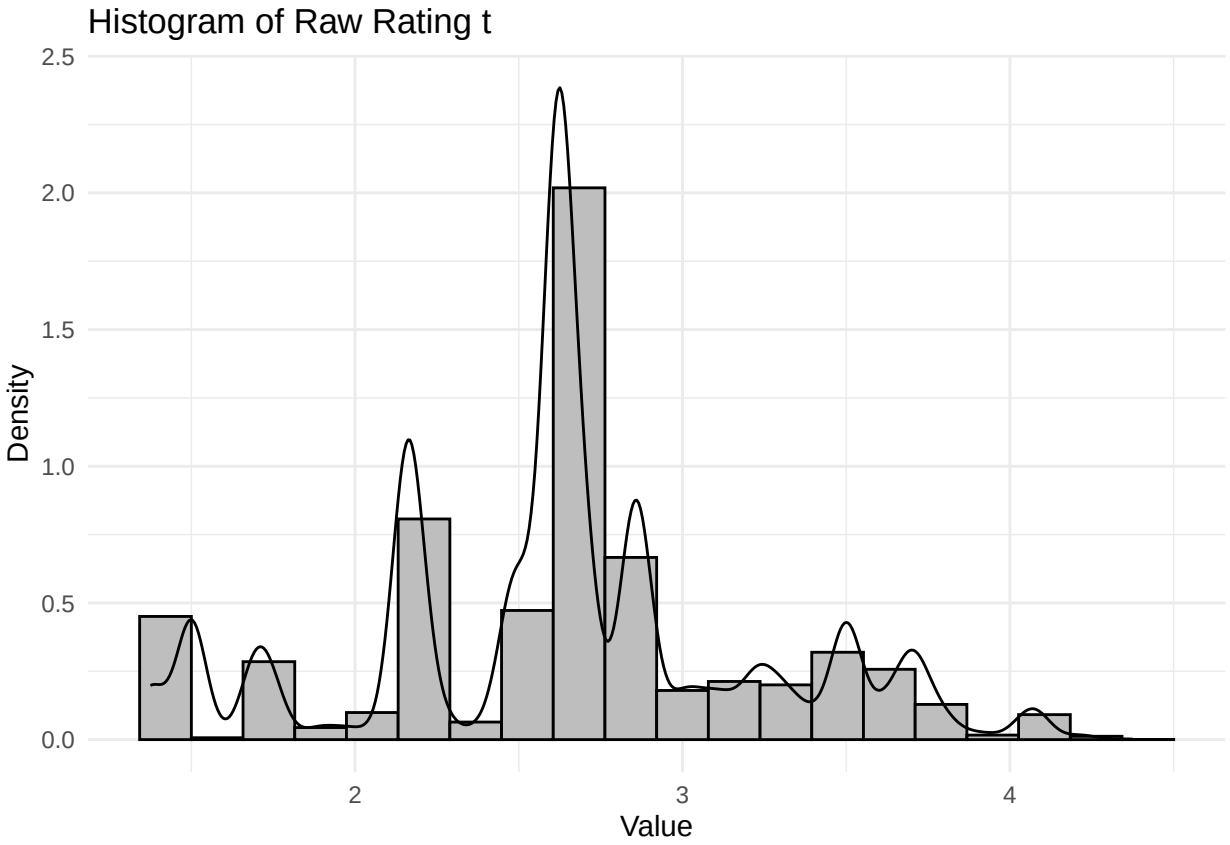
```
## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
## Number of Obs.                16619         9595
## Eff. Number of Obs.            2277          532
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.100        0.100
## BW bias (b)                   0.100        0.100
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
## ===============================================================================
##   Conventional     0.012     0.003     3.510     0.000     [0.005 , 0.018]
##         Robust         -         -     2.391     0.017     [0.008 , 0.076]
## ===============================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
## Number of Obs.                16619         9595
## Eff. Number of Obs.            2357         1690
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.120        0.120
## BW bias (b)                   0.120        0.120
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
## ===============================================================================
##   Conventional     0.019     0.003     5.806     0.000     [0.013 , 0.025]
##         Robust         -         -     0.698     0.485    [-0.019 , 0.041]
## ===============================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
```

```
## Number of Obs.                16619         9595
## Eff. Number of Obs.            4678         1735
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.130        0.130
## BW bias (b)                   0.130        0.130
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
## ===============================================================================
##   Conventional     0.006     0.002     3.836     0.000     [0.003 , 0.009]
##         Robust         -         -     4.812     0.000     [0.032 , 0.076]
## ===============================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
## Number of Obs.                16619         9595
## Eff. Number of Obs.            8374         1968
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.140        0.140
## BW bias (b)                   0.140        0.140
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
## ===============================================================================
##   Conventional     0.011     0.002     6.892     0.000     [0.008 , 0.014]
##         Robust         -         -    -9.372     0.000    [-0.056 , -0.037]
## ===============================================================================

## Sharp RD estimates using local polynomial regression.
##
## Number of Obs.                26214
## BW type                      Manual
## Kernel                      Uniform
## VCE method                      HC0
##
## Number of Obs.                16619         9595
## Eff. Number of Obs.            8374         2045
## Order est. (p)                    1            1
## Order bias  (q)                   2            2
## BW est. (h)                   0.150        0.150
## BW bias (b)                   0.150        0.150
## rho (h/b)                     1.000        1.000
##
## ===============================================================================
##         Method     Coef. Std. Err.         z     P>|z|      [ 95% C.I. ]
```

```
## ================================================================================
##   Conventional     0.012     0.001     8.013     0.000     [0.009 , 0.014]
##         Robust         -         -    -9.865     0.000    [-0.058 , -0.038]
## ================================================================================
```

As the bandwidth increases, the sensitivity decreases. Thus, a smaller bandwidth is more sensitive and more representative.

Question 8



There appears to be a high density just above 3 stars. This means that there are a larger amount of plans being rounded up to 3 stars compared to rounded down. This could put the plans that are rounded down to 3 stars at a disadvantage. There is also high density just above 2 star ratings, and those plans are likely being rounded down to 2 stars.

Question 9

I was not sure how to go about this question. In the dataset I created for part 2 of the assignment (just for 2009), there is no year column. So, I tried to go back and work with the final data set. I initially tried to filter the data that had HMO/HMOPOS under the plan_type column, yes under the pland column, and 2009 under the year column using the filter and group_by function. I know how to evaluate the plans above the threshold values but the part that I was unsure about was how to incorporate the plan characteristics into the analysis. I would assume that I have to use the rorobust package and filter the variables that I describe before as I created a density graph like I did in problem 4. However, I kept getting an error for this.

Question 10

Increasing star rating increases enrollments. This can be seen by the fact that the plans with a higher star rating had a higher number of enrollees, despite not having a drastic difference in quality. There is a bigger impact when the star ratings are on the lower end compared to when the star ratings are on the higher end. For exmaple, people are more likely to choose a 2.5 over a 2 rating versus a 4.5 over a 4 rating.