

Homework 2

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Answers

1.

There were 2329 providers across the years that submitted more than 1 report in a single year.
Number of providers that turned in more than 1 report

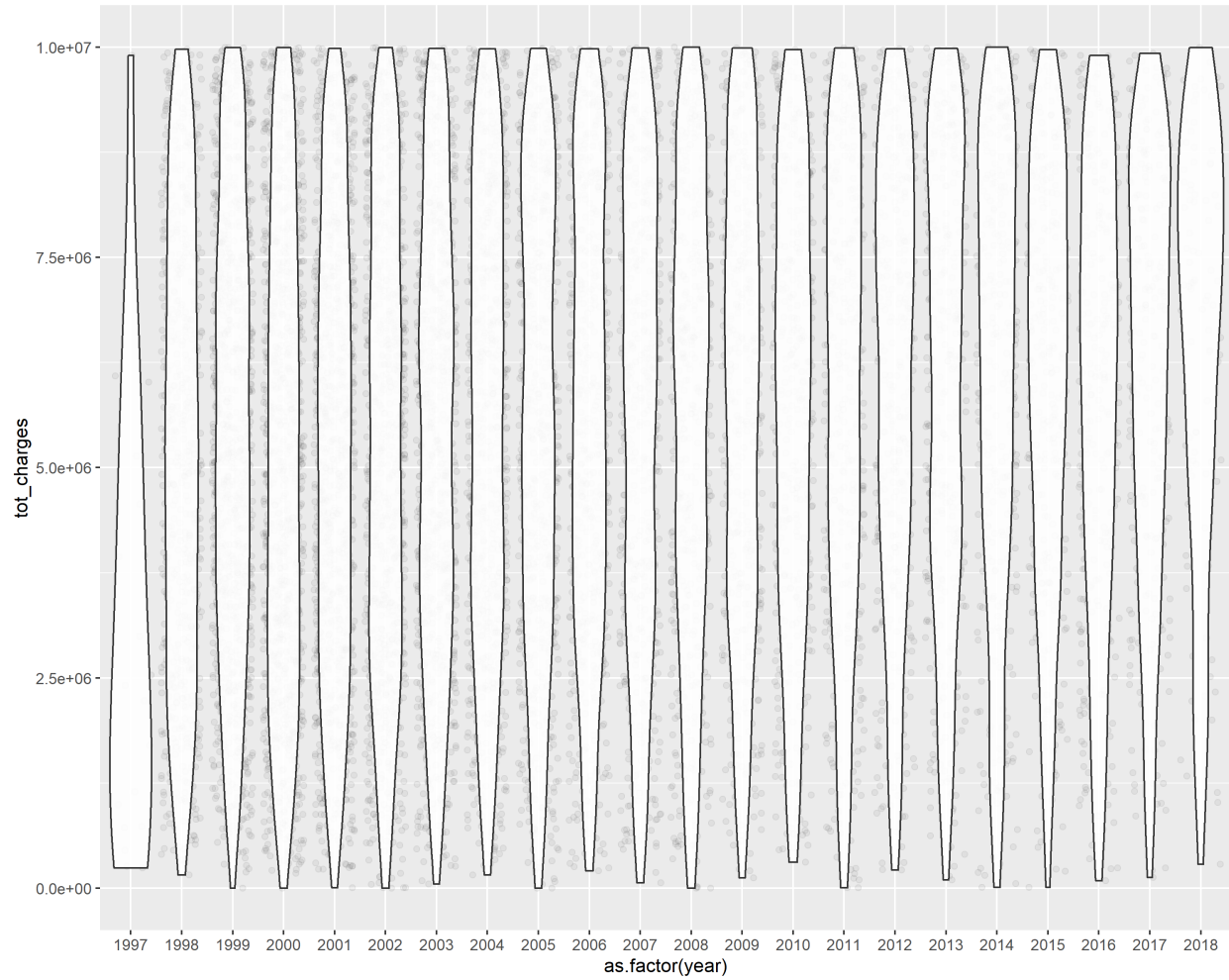


2.

There are 9323 unique provider numbers over the years.

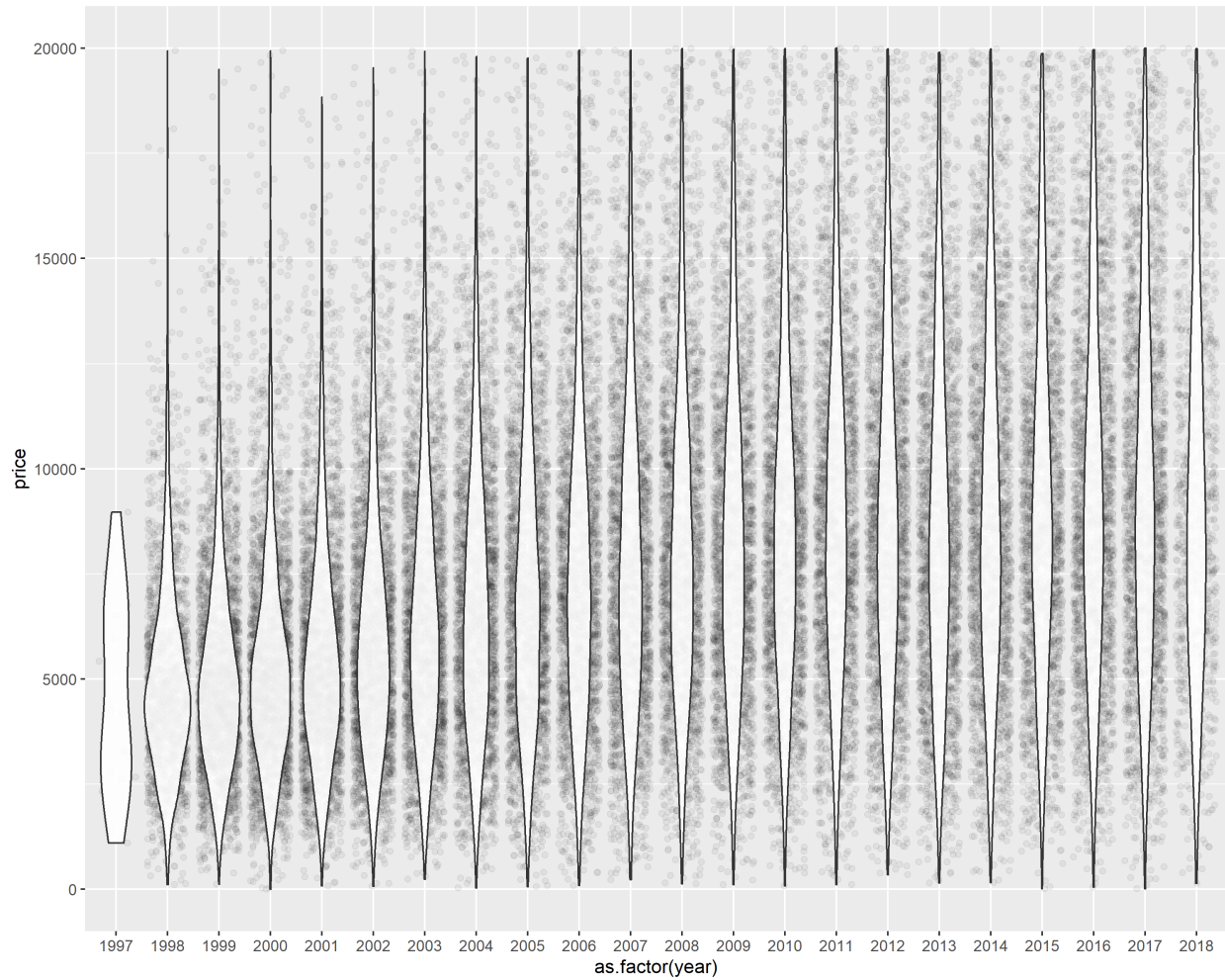
3.

This graph demonstrates the distribution of charges for each year. For the sake of the graph, observations with total charges of over 10,000,000 have been dropped.



4.

This graph represents the distribution of prices over the years, as prices calculated by all charges for a hospital multiplied by the discount factor and subtracting medicare payments, all divided by the total number of discharges outside of medicare patients. For the sake of the graph, observations with the price greater than 20,000 have been excluded.



5

The average price for penalized hospitals is 9,789.33 whereas the average price for non-penalized providers is 9,398.832. In this calculation I dropped all prices over 50,000 as well any prices below 0.

6

```
## 'summarise()' has grouped output by 'group', 'quartile1', 'quartile2',
## 'quartile3'. You can override using the '.groups' argument.
```

```
## # A tibble: 8 x 6
## # Groups:   group, quartile1, quartile2, quartile3 [8]
##   group    quartile1 quartile2 quartile3 quartile4 price_mean
##   <chr>      <dbl>      <dbl>      <dbl>      <dbl>      <dbl>
## 1 Control          0          0          0          1    11056.
## 2 Control          0          0          1          0     8467.
## 3 Control          0          1          0          0     7326.
## 4 Control          1          0          0          0     7612.
## 5 Treatment        0          0          0          1    11184.
## 6 Treatment        0          0          1          0     8519.
```

```
## 7 Treatment      0      1      0      0      7997.
## 8 Treatment      1      0      0      0      6981.
```

7

```
## Warning: package 'knitr' was built under R version 4.2.2
```

	term	estimate	std.error	statistic	p.value
Linear Regression	penalized	1037.679575236245	5.500269684012	27810968357086	0.022814475146533
Inverse Propensity Weighting	penalized	1022.956969782027	5.849583852145	49483558597296	6.31904965569591e-06
Nearest Neighbor (Inverse Variance)	penalized	1431.587528044290	1.60050134474NA		NA
Nearest Neighbor (Mahalanobis)	penalized	199.725262034102	0.37090944149NA		NA

8

Each of these estimators are different, but there certainly some that are closer than others. For example, the linear regression, as well as inverse propensity weighing estimates are very close, 1037 and 1022. These differ greater though from the two nearest neighbor matchings.

9

It is unlikely we have sufficiently estimated the effect of the penalty as we are not controlling for enough factors. Number of beds is most likely not the only metric we should use to control or determine similarity between providers, in order to determine an accurate estimate.

10

Honestly I struggled a lot with 6 and 7. With 6, the first part was fairly easy, but for whatever reason, creating a table as you specified was very difficult for me. I assume the best way would be to use the `pivot_wider` function, but I was not able to get it to work properly. In addition to this, 7 was similarly difficult as I found it hard to know exactly how to incorporate the quartiles, as well as how to make a good table.