1. (Baseline Model) In this question we build a basic model for predicting race winners. Construct a feature avg mmps containing the average value of mmps from all strictly prior races for that dog. The definition of mmps is described in Live Lecture 11. You can directly use the parameters defining mmps from the lecture. Fit a conditional multinomial logit model of the form

$$\texttt{twinner} \sim \texttt{avg mmps}.$$

Here twinner is equal to winner for races with a unique winner, and is a randomly chosen winner in the other cases (see the conditional logit model notebook for code that creates the twinner column, and for the mlogit function that fits a conditional multinomial logit model).

(a) Fit the above model on races between July 1st, 2019 and January 31st, 2020, and report your coefficients.

	coef
(Intercept):2	-0.0477
(Intercept):3	0.0113
(Intercept):4	-0.0187
(Intercept):5	-0.1105
(Intercept):6	0.0085
avg_mmps	1.2645

(b) Report your out-of-sample Brier score using the races on and after February 1st, 2020. This is computed using all of your forecasted probabilities, the twinner column, and the Brier score loss function from sklearn.

```
Brier Score:  0.14007
```

(c) Submit your results to this problem (i.e., 1 only) in a single PDF on gradescope (listed under HW 8 Check-in - 1). You will also resubmit your solutions to this problem when you submit the full miniproject (listed under HW 8).