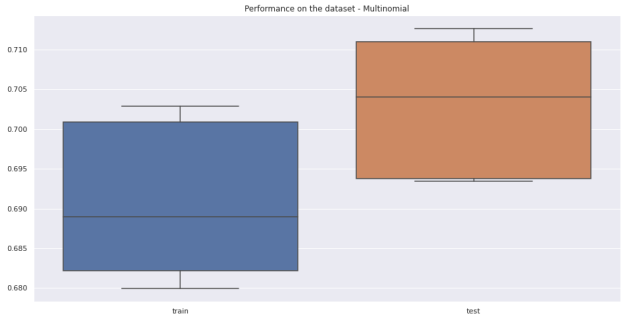
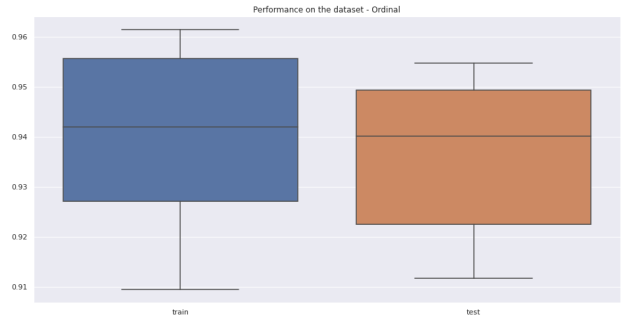


(a) Multinomial logistic regression



(b) Ordinal logistic regression

Figure 1: Model performance on the dataset (10 bootstrap iterations)

In this task, data is split in training data of66.6% (first 130 samples) and test data is 33.3%. Log-loss train test dataset measures are presented in (Figure 1) for both models.

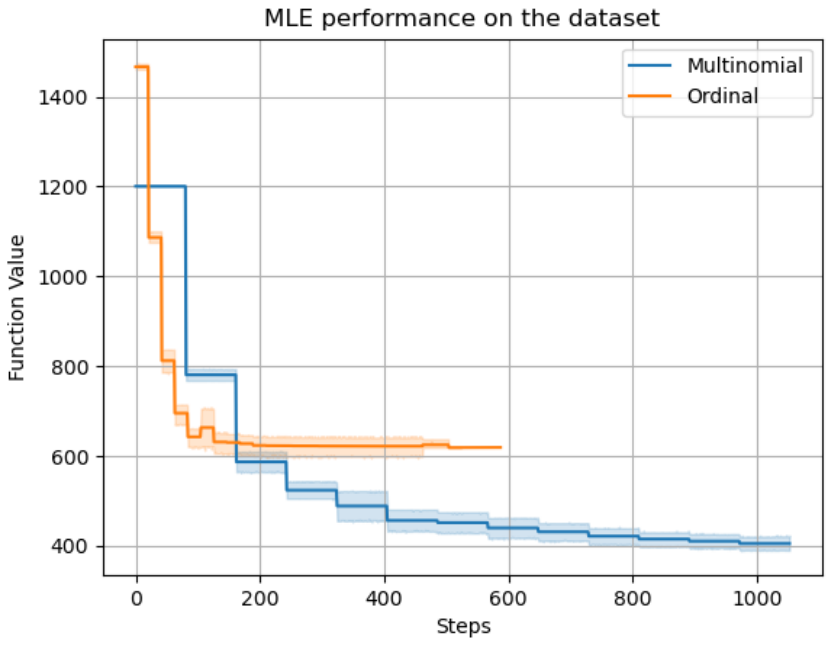


Figure 2: MLE optimization values with SD, 10 bootstrap iterations

In Figure 3 Barplot of each coefficients in Multinomial Log.Reg. and intercept (no. boot=5) is presented.We can see that each attribute is represented with $5(m-1); m = 6$ boundary sets. Observing the values we can see that most attributes have biggest values in Category 0, where model is using category 0 as referent category. Having that in mind, we can see that intercept can be interpreted as prior belief of the model where its value is describing how much times event is more likely to happened. This is in our case - *"our class vs. others"*. In 1 class encoding overview is given. Observing the coefficients plot we can see e.g. that model has an increase in boundary 1 where the decision is made for Layup shot. Here we can see that PlayerType attribute is increased in importance, since it is more likely e.g. that center player is going to shoot but not go to layup.

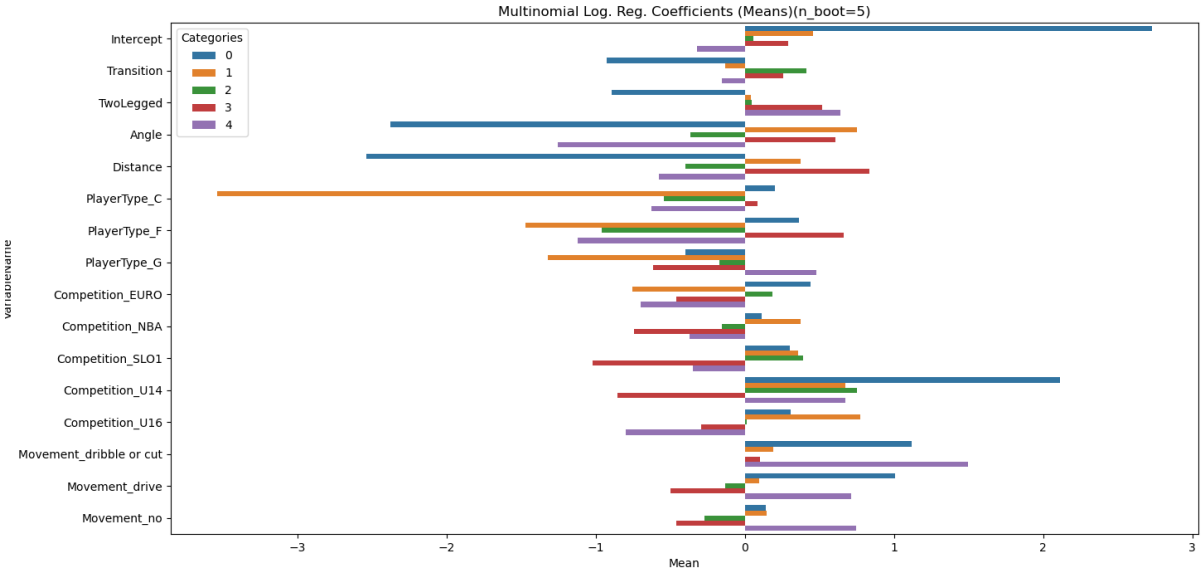


Figure 3: Coefficients mean values for Multinomial Log. Reg

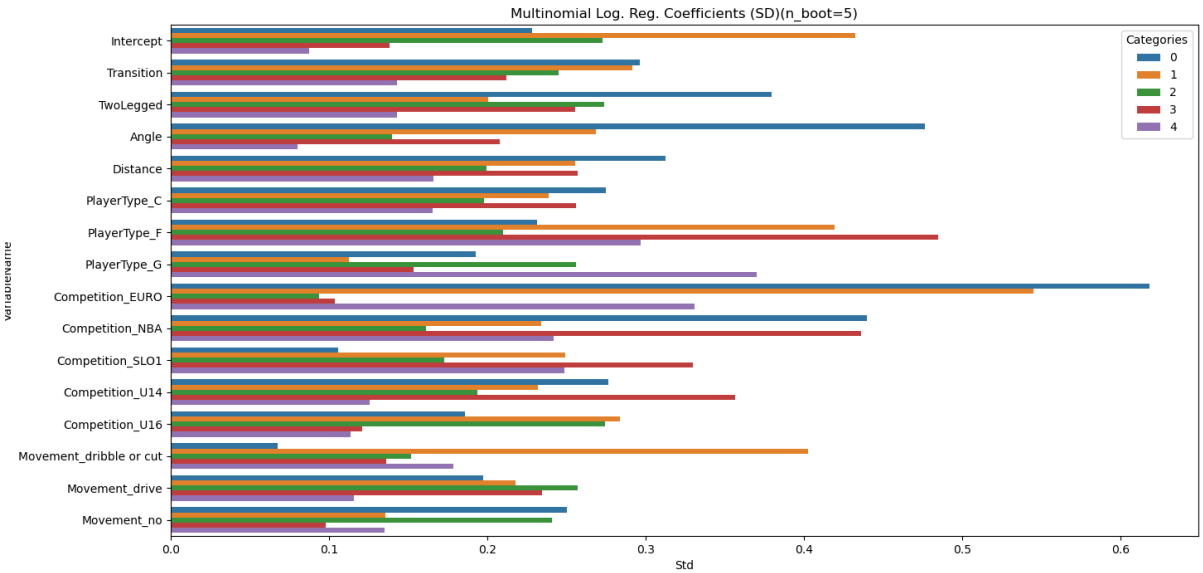


Figure 4: Coefficients SD values for Multinomial Log. Reg

Class Name	Number
Above Head	1
Layup	2
Hook Shot	3
Dunk	4
Tip in	5
Other	6

Table 1: Class labeling

In the DGP task, dataset is constructed with three variables: weight, height and sex. Dataset is constructed with following formulas:

$$height = N(185, 5)$$

$$weight = 30 + \beta(4, 4) * 150$$

$$sex = uniform\ choice([0, 1])(M, F)$$

Target variable is formulated as set of rules. If your weight is interval $-10\,\&\,+10$ from your $height - 100$(women $height - 120$) then you are perfect weight. Anything smaller than that is slim and anything higher then that interval is obese. This constructions created ordinal target variables with clear connections between height,weight and labeling if person is slim, perfect or obese weight. Presented results on 5 and 2 is measured on $10,000$ data points which we splitted $66,6\%$ train and 33.3% test set.

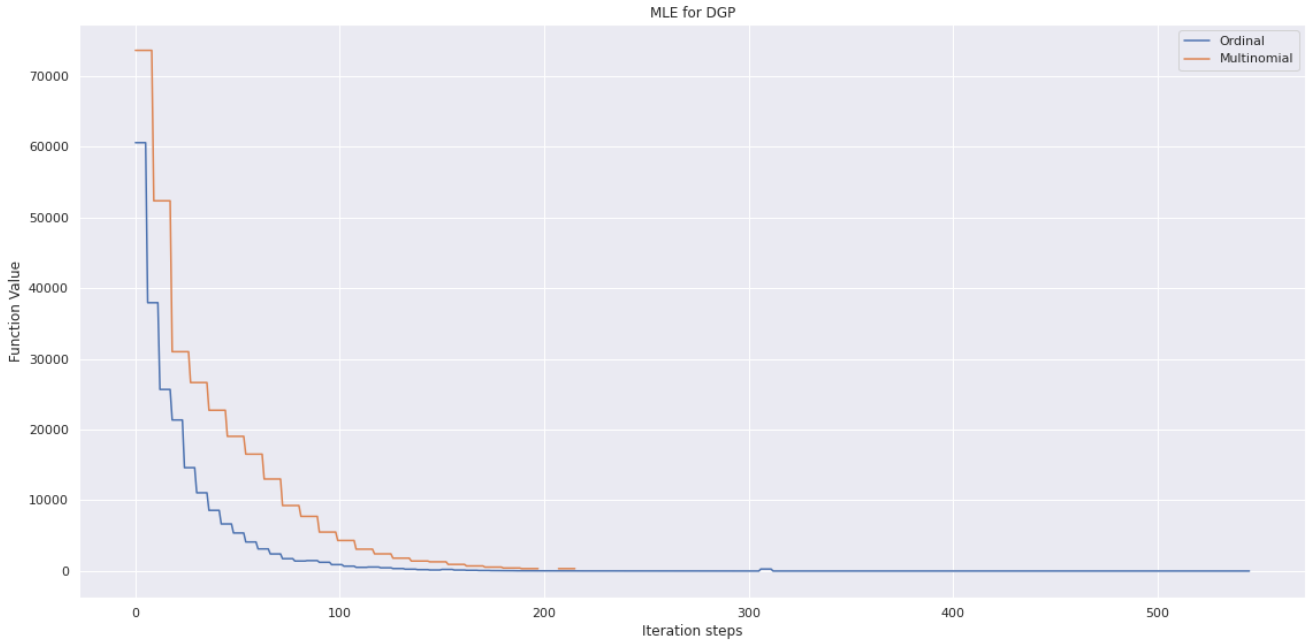


Figure 5: MLE on DGP data

Model	Final MLE value
Ordinal	$6.009 * e^{-5}$
Multinomial	33.357

Table 2: MLE values after optimization (DGP)