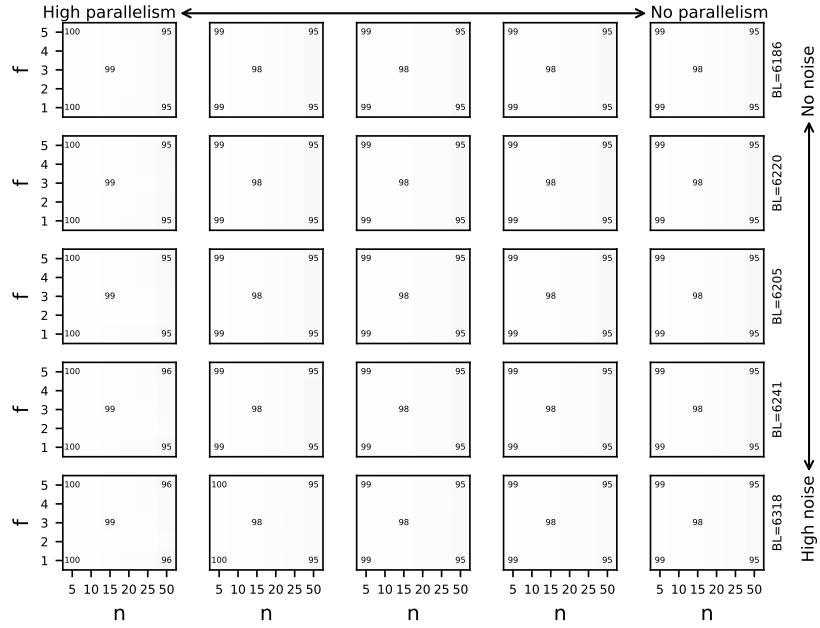


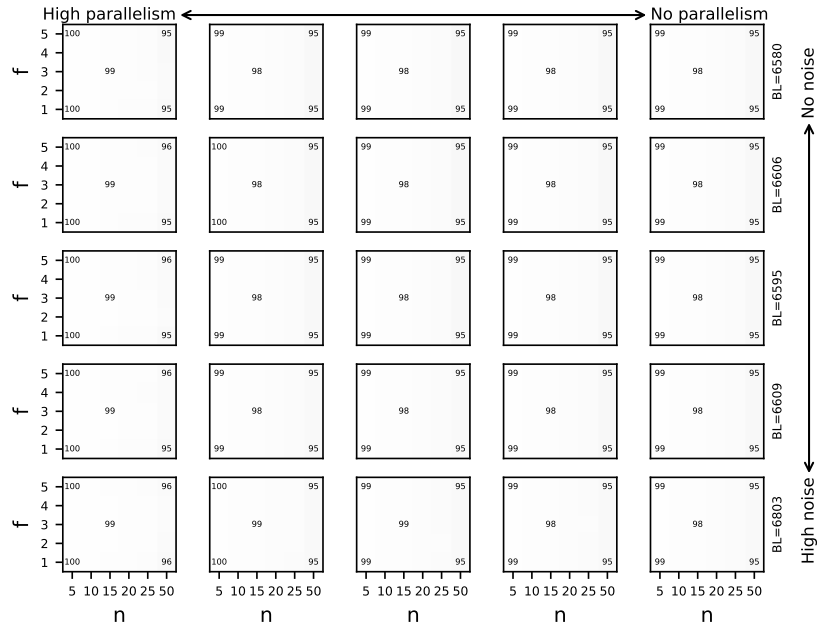
# Appendix 3

## **.1 Machine Learning based Marking Prediction (*MLc*).**

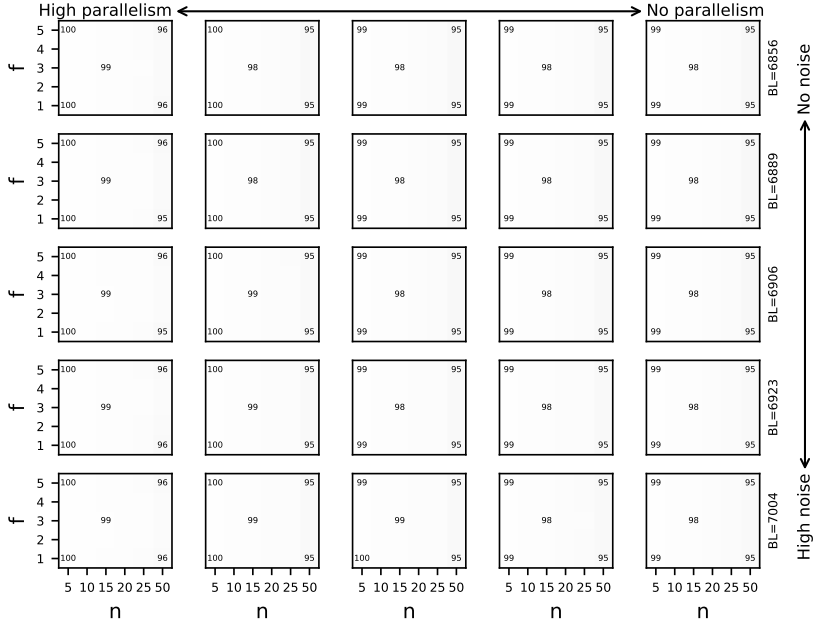
In this section, we provide the complete set of results for the experiments with *a12*, *a22*, and *a32* synthetic events logs for the *MLc* stateless approach.



(a) Skewness of decisions level 0

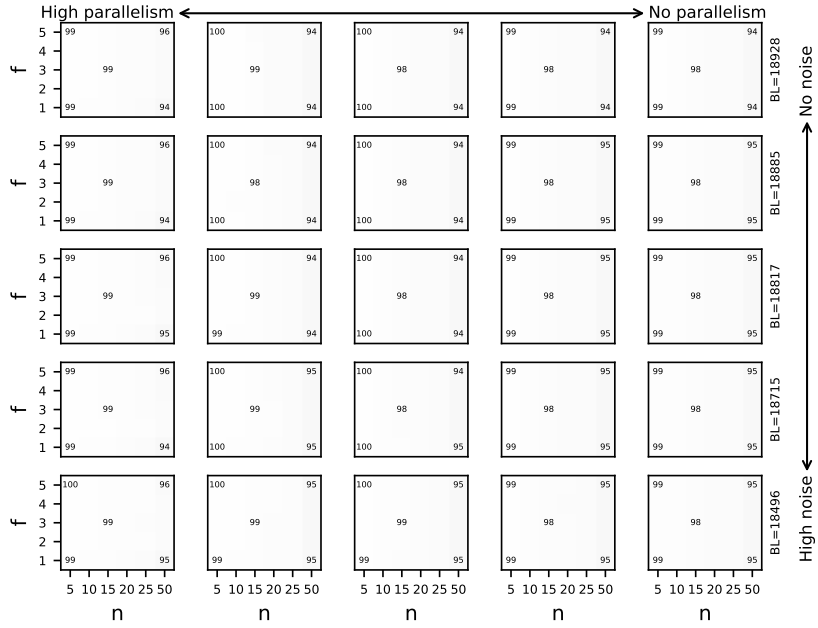


(b) Skewness of decisions level 1

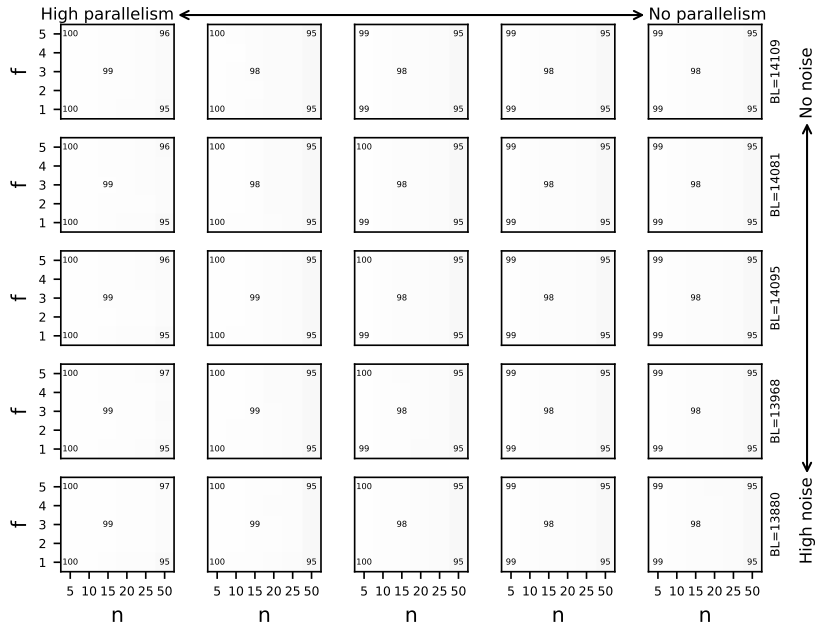


(c) Skewness of decisions level 2

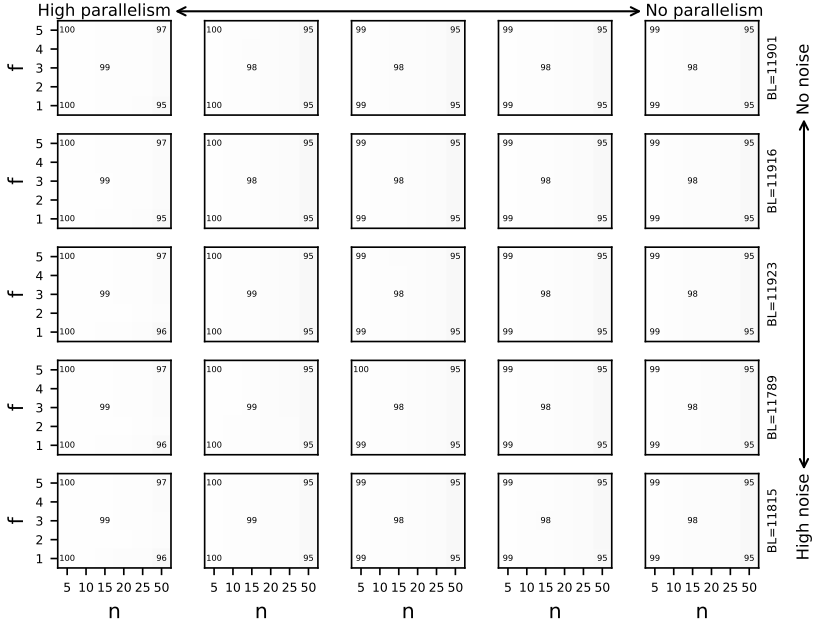
Figure 15: Percentage reduction in memory footprint w.r.t. the baseline (BL) for *a12* event logs with different skewness of decisions and noise levels with *MLc* as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The value  $n$  on the X-axis is the maximum number of cases allowed to be retained in  $D_C$ . The number on the secondary Y-axis is the maximum states consumed by the baseline (BL).



(a) Skewness of decisions level 0

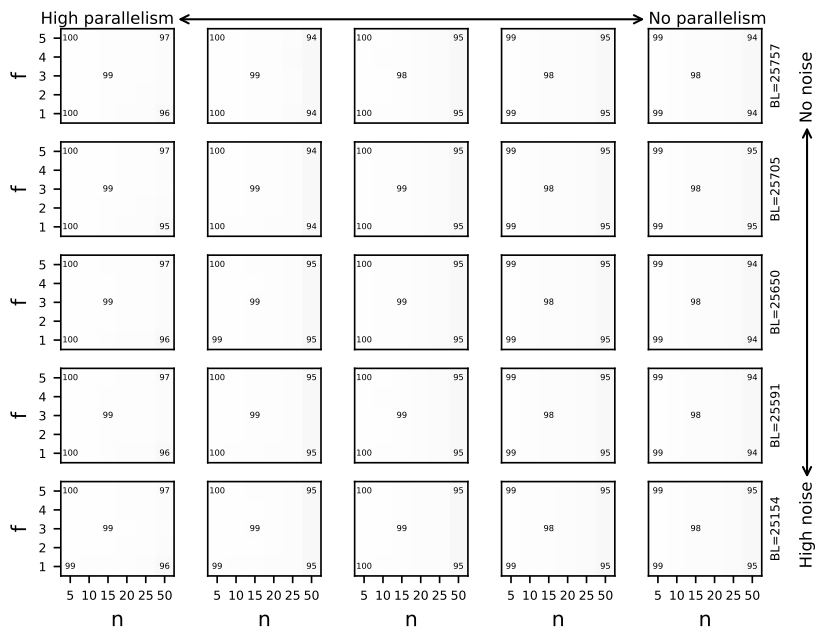


(b) Skewness of decisions level 1

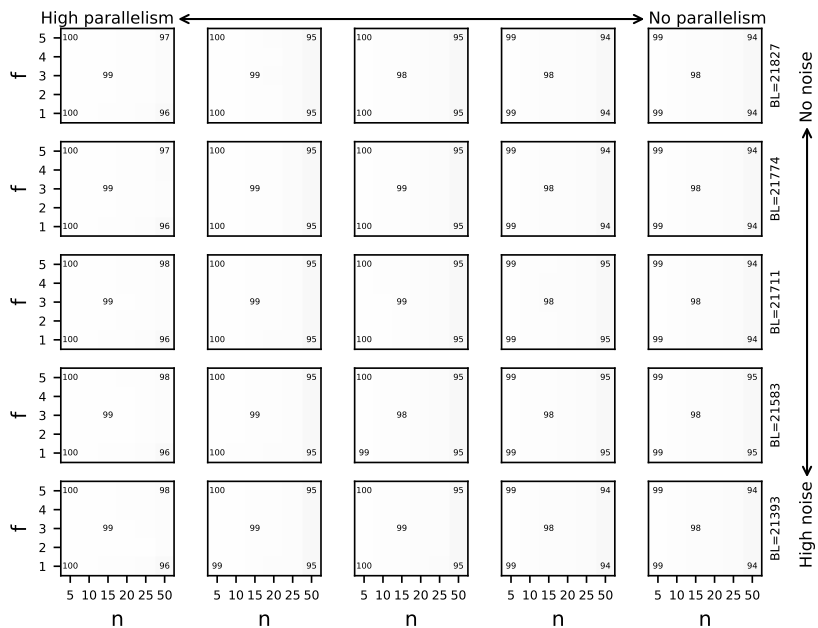


(c) Skewness of decisions level 2

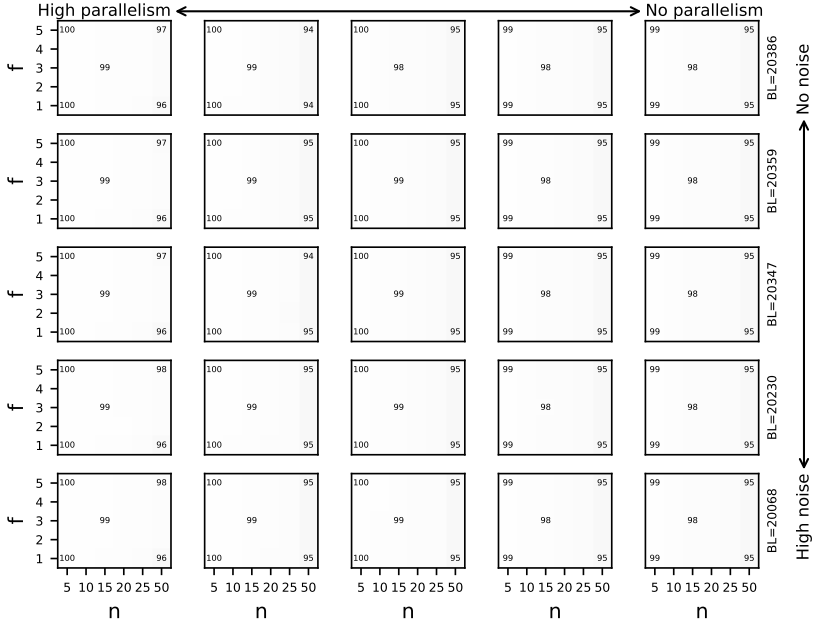
Figure 16: Percentage reduction in memory footprint w.r.t. the baseline (BL) for *a22* event logs with different skewness of decisions and noise levels with *MLc* as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The value *n* on the X-axis is the maximum number of cases allowed to be retained in  $D_C$ . The number on the secondary Y-axis is the maximum states consumed by the baseline (BL).



(a) Skewness of decisions level 0

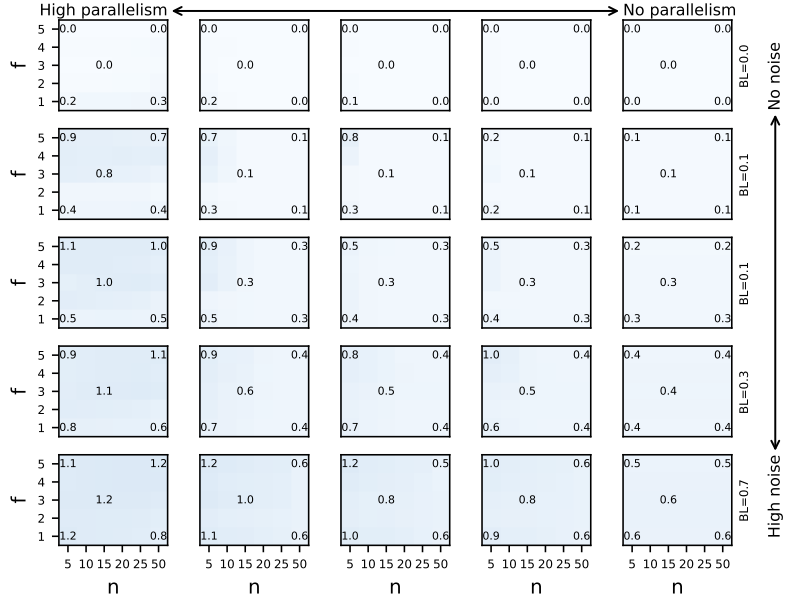


(b) Skewness of decisions level 1

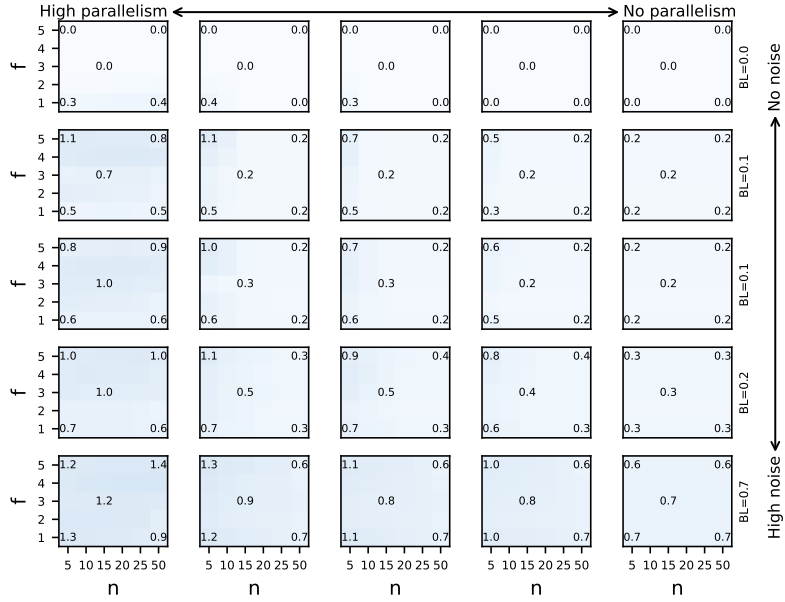


(c) Skewness of decisions level 2

Figure 17: Percentage reduction in memory footprint w.r.t. the baseline (BL) for *a32* event logs with different skewness of decisions and noise levels with *MLc* as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The value  $n$  on the X-axis is the maximum number of cases allowed to be retained in  $D_C$ . The number on the secondary Y-axis is the maximum states consumed by the baseline (BL).

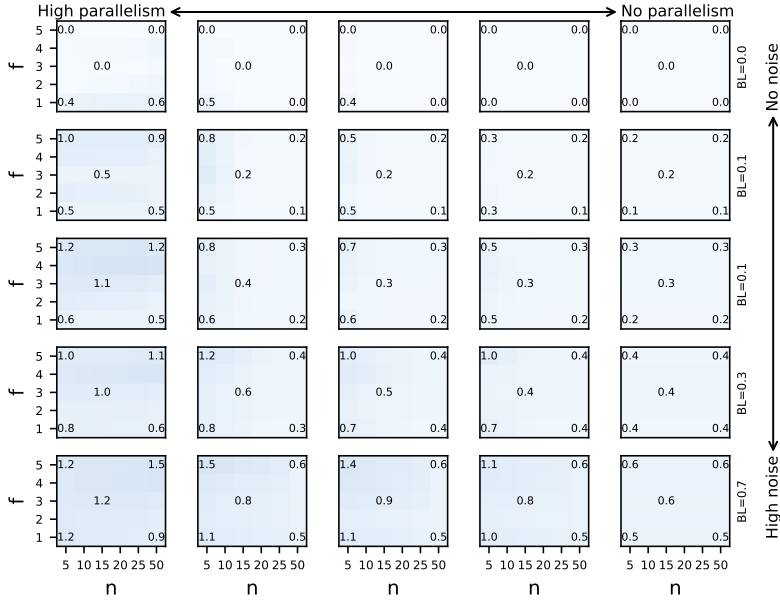


(a) Skewness of decisions level 0



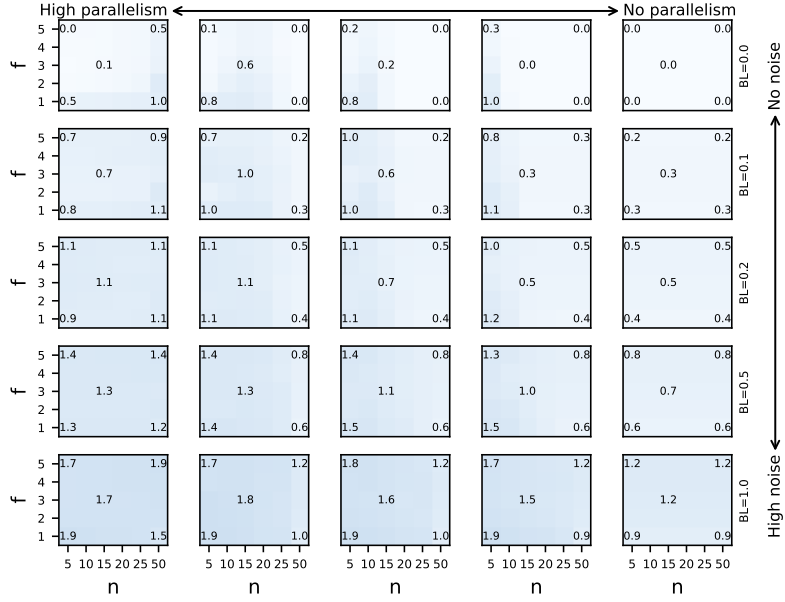
(b) Skewness of decisions level 1



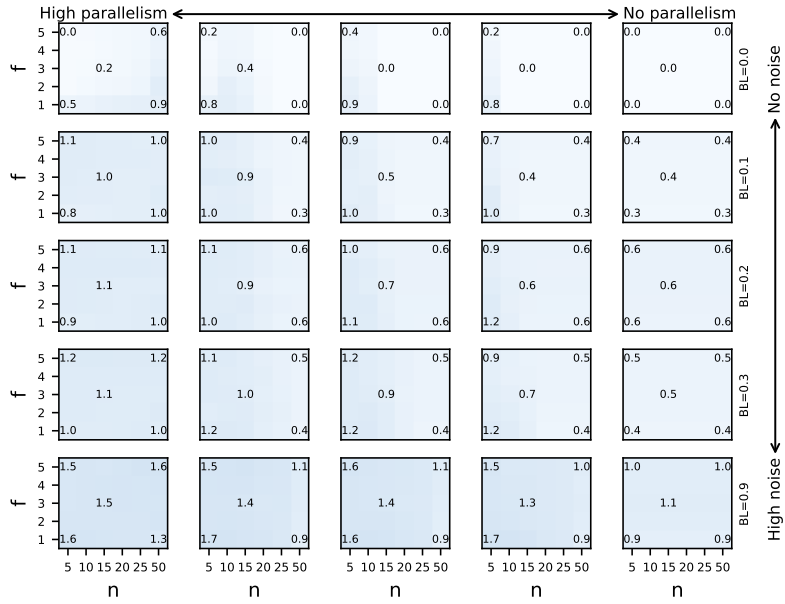


(c) Skewness of decisions level 2

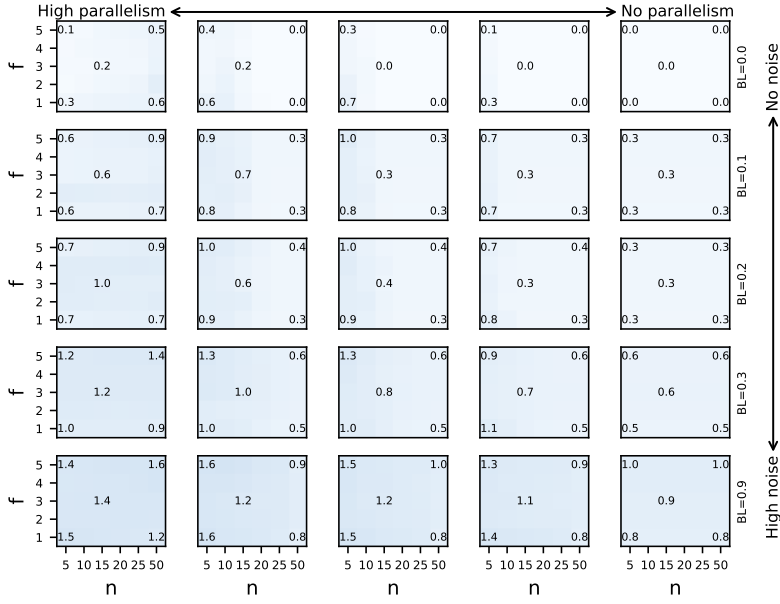
Figure 18: RMSE for *a12* event logs with different decision skewness and noise levels with *MLc* as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The number on the secondary Y-axis is the avg. trace fitness cost over the log by the baseline(BL).



(a) Skewness of decisions level 0

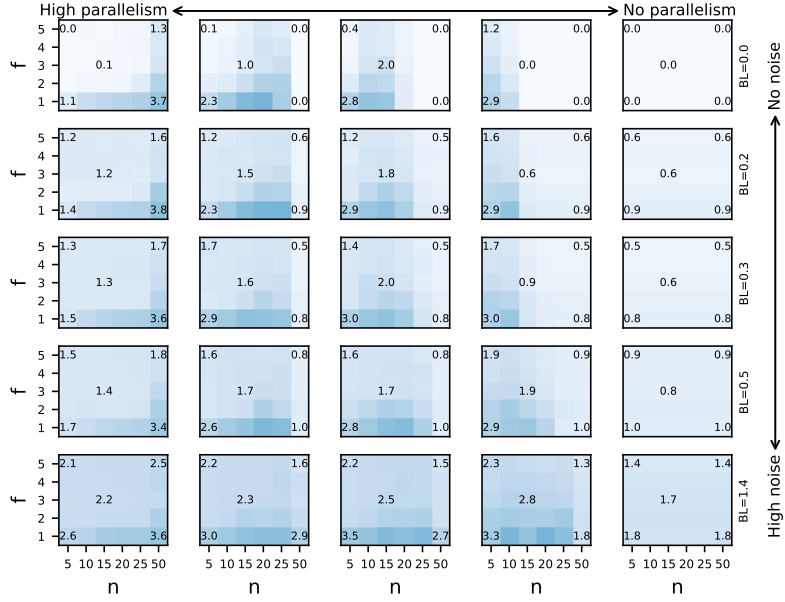


(b) Skewness of decisions level 1

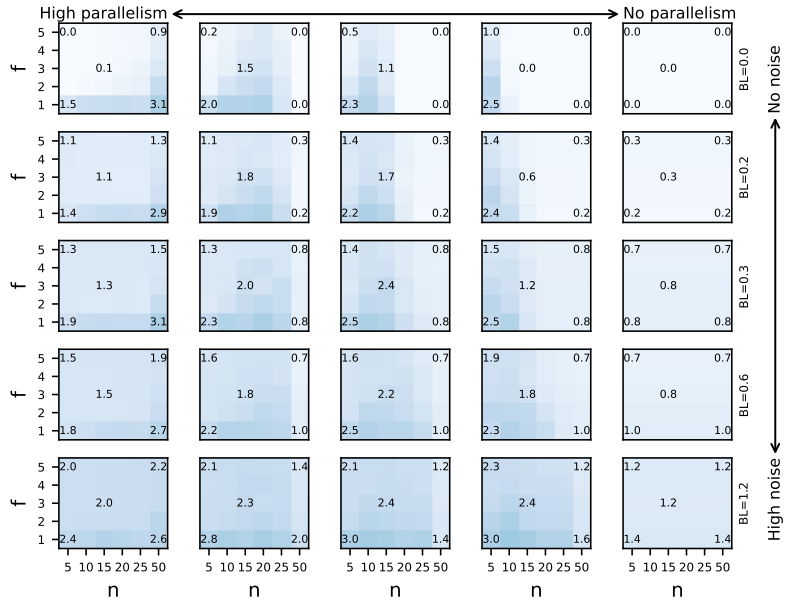


(c) Skewness of decisions level 2

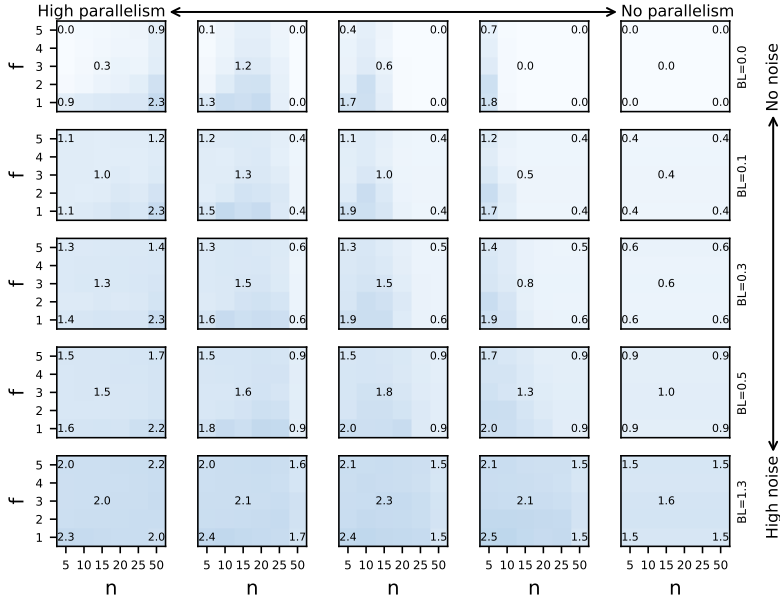
Figure 19: RMSE for *a22* event logs with different decision skewness and noise levels with *MLc* as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The number on the secondary Y-axis is the avg. trace fitness cost over the log by the baseline(BL).



(a) Skewness of decisions level 0

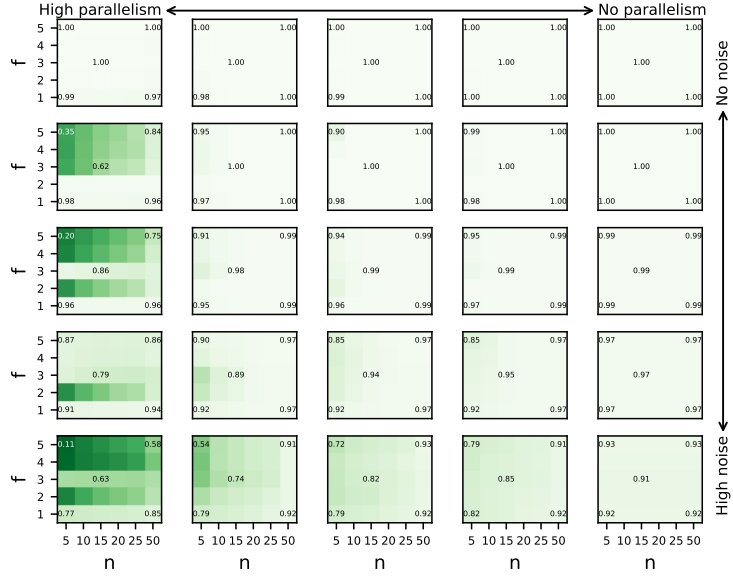


(b) Skewness of decisions level 1

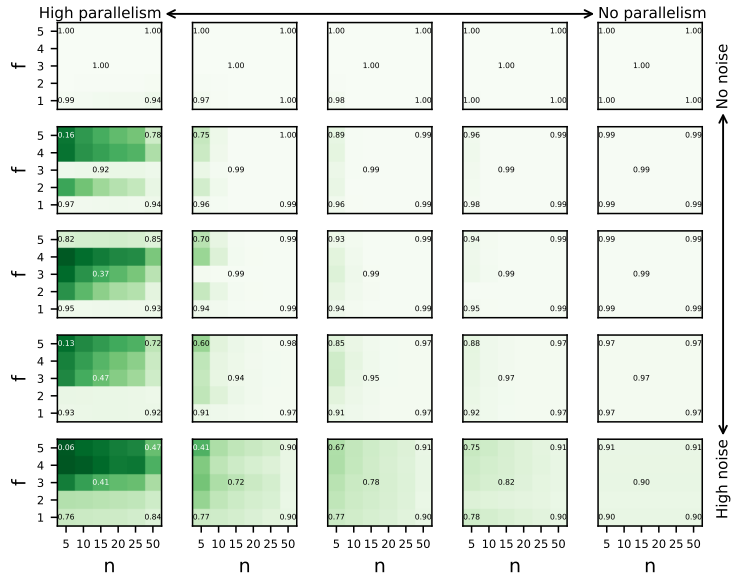


(c) Skewness of decisions level 2

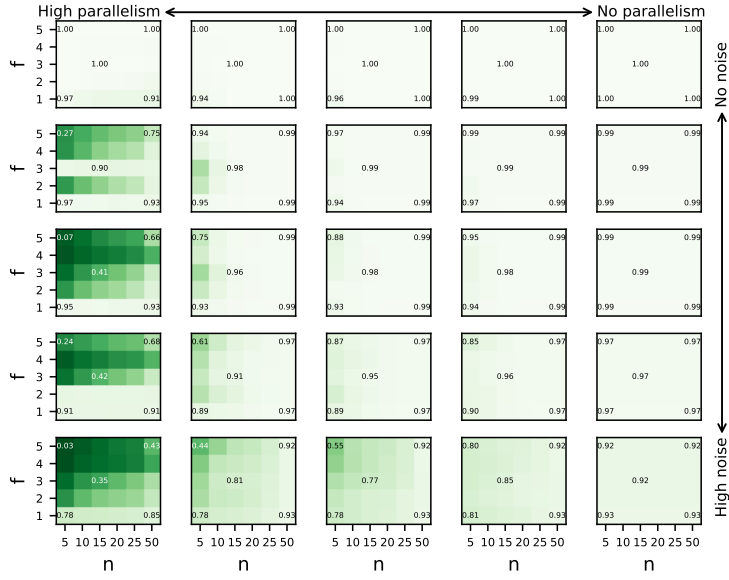
Figure 20: RMSE for *a32* event logs with different decision skewness and noise levels with *MLc* as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The number on the secondary Y-axis is the avg. trace fitness cost over the log by the baseline(BL).



(a) Skewness of decisions level 0

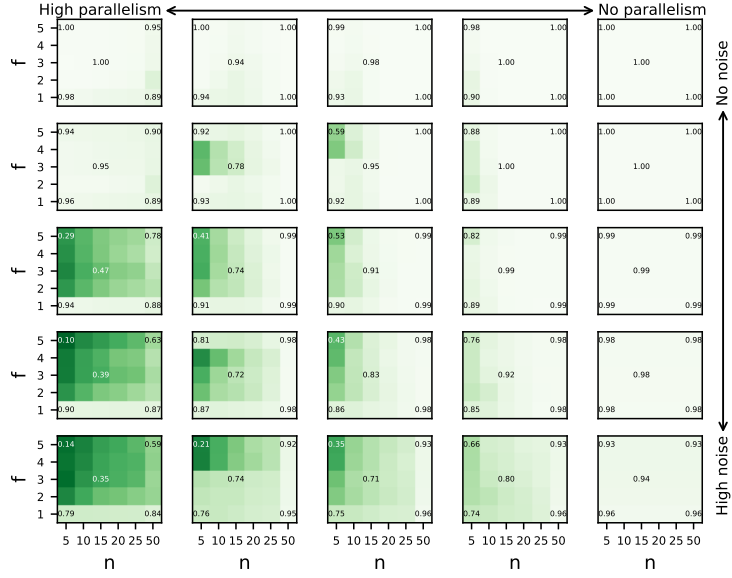


(b) Skewness of decisions level 1

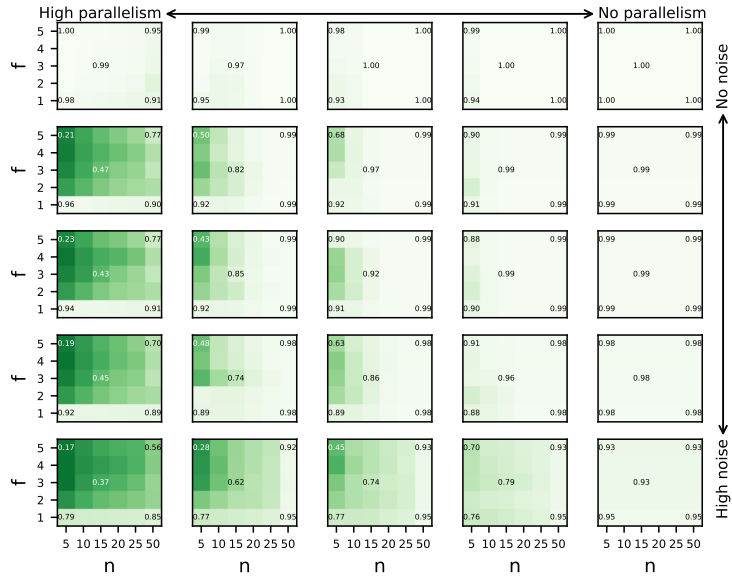


(c) Skewness of decisions level 2

Figure 21:  $F_1$  for  $a_{12}$  event logs with different decision skewness and noise levels with  $MLc$  as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values.

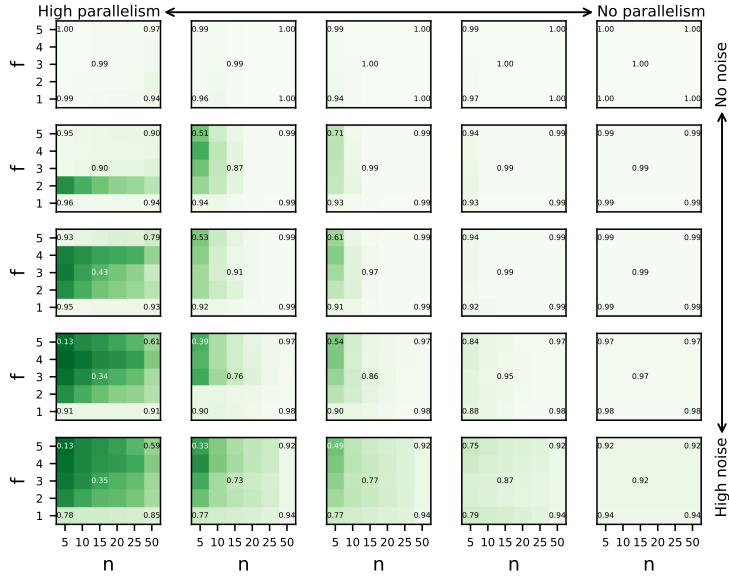


(a) Skewness of decisions level 0



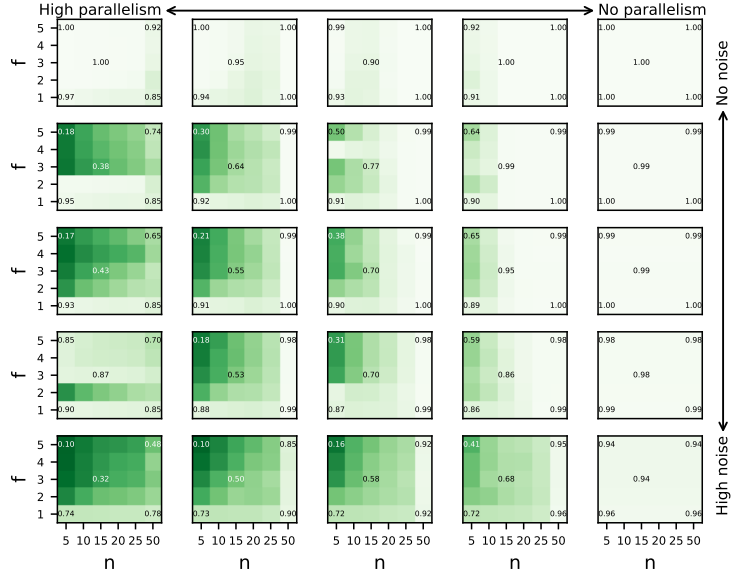
(b) Skewness of decisions level 1



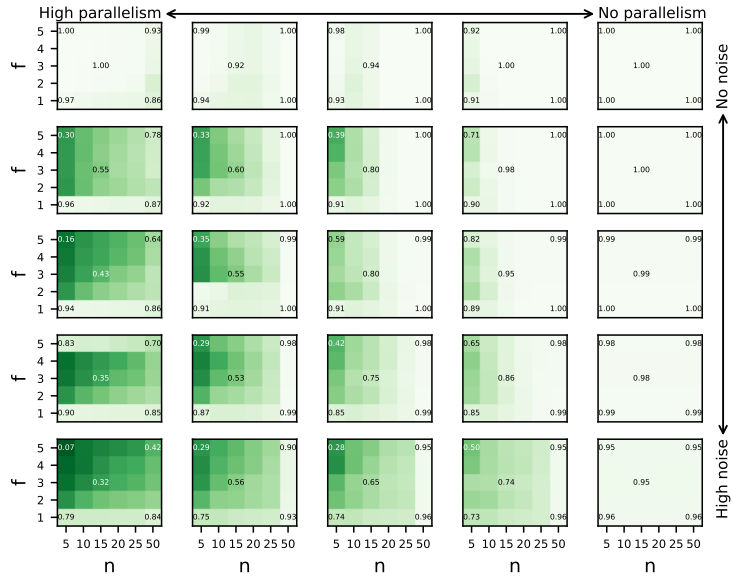


(c) Skewness of decisions level 2

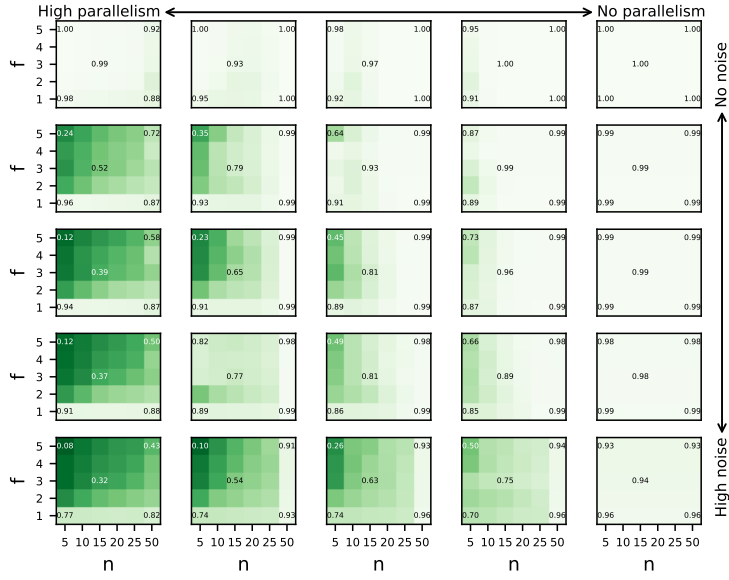
Figure 22:  $F_1$  for  $a22$  event logs with different decision skewness and noise levels with  $MLc$  as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values.



(a) Skewness of decisions level 0



(b) Skewness of decisions level 1



(c) Skewness of decisions level 2

Figure 23:  $F_1$  for  $a32$  event logs with different decision skewness and noise levels with  $MLc$  as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values.