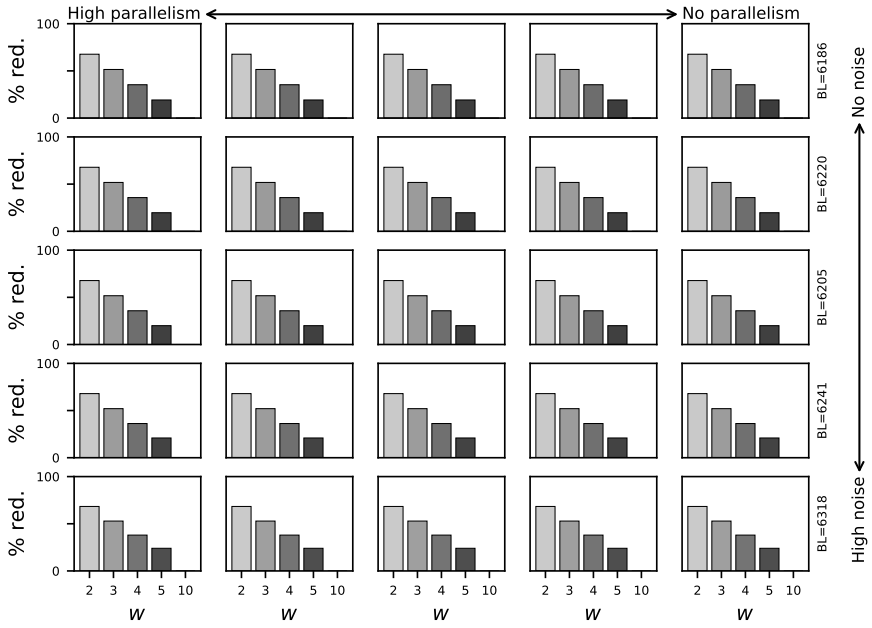
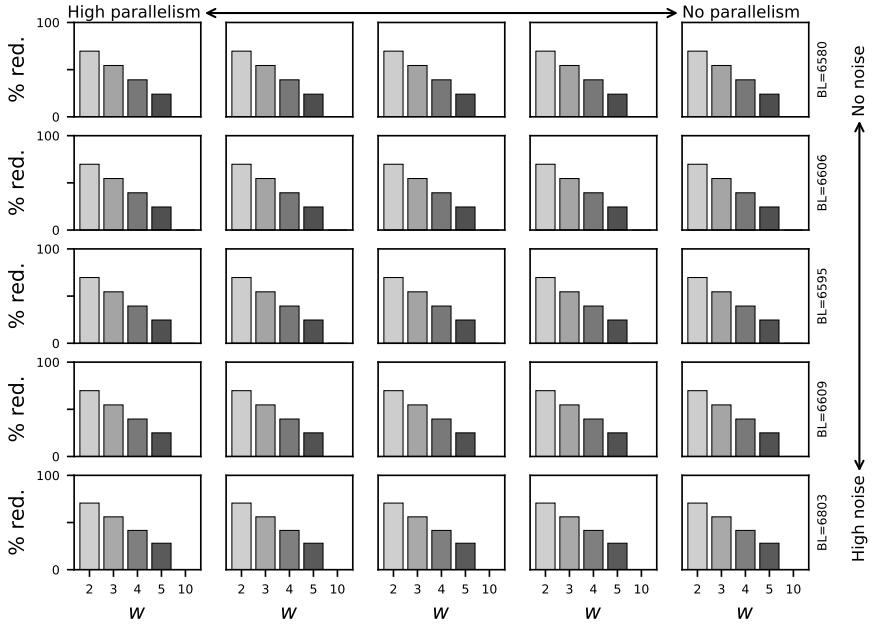
# Appendix 4

## .1 Bounding States with Carry-forward Marking and Cost($CFs$).

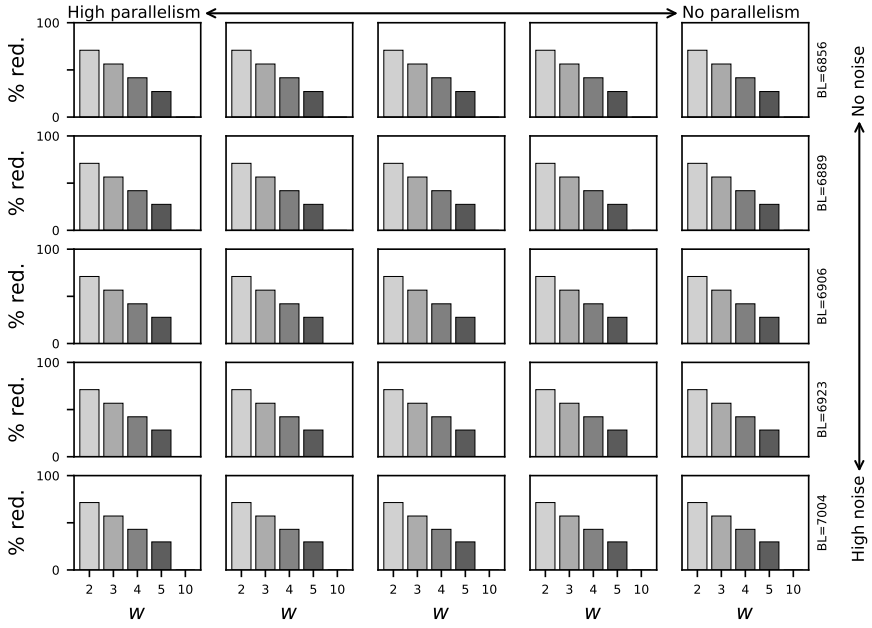
In this section, we provide the complete set of results for the experiments with $a12$, $a22$, and $a32$ synthetic events logs for the $CFs$ stateful approach.




(a) Skewness of decisions level 0

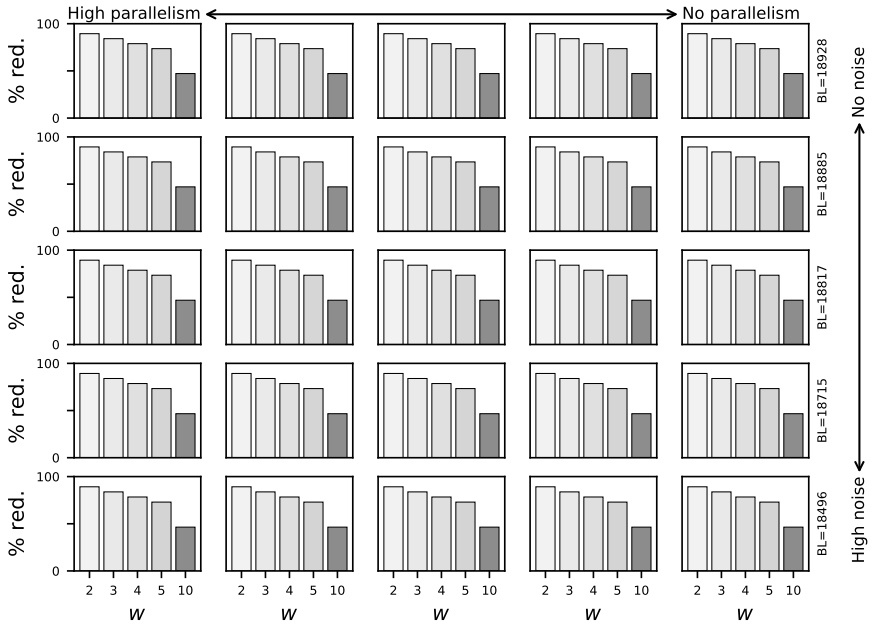



(b) Skewness of decisions level 1

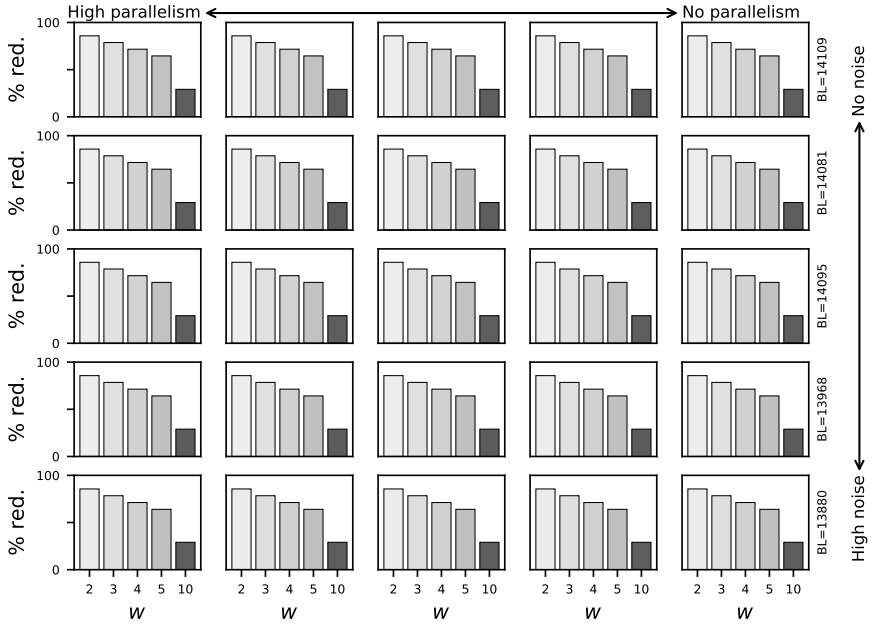



(c) Skewness of decisions level 2

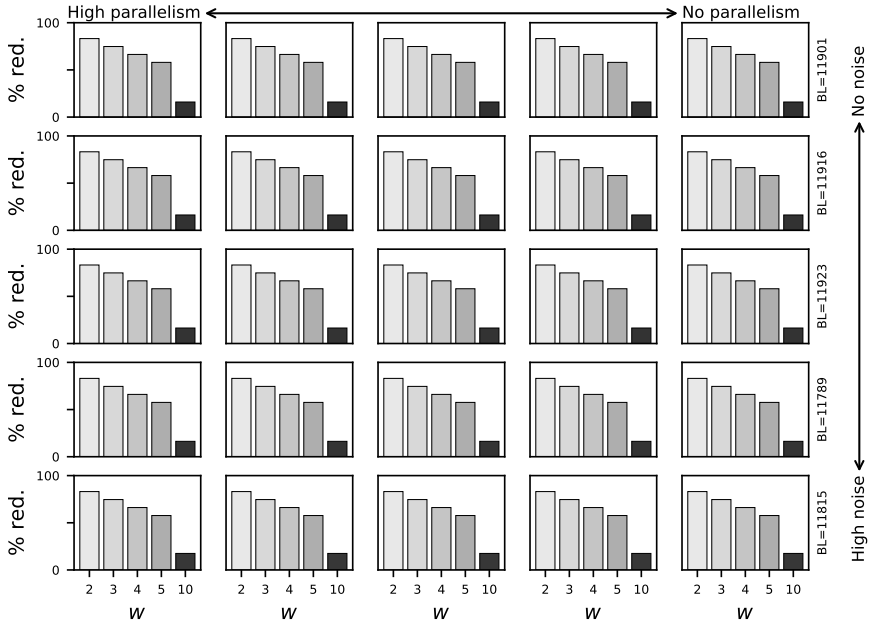
Figure 24: Percentage reduction in memory footprint w.r.t. the baseline (BL) for $a12$ event logs with different skewness of decisions and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The value $w$ on the X-axis is the maximum number of states 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

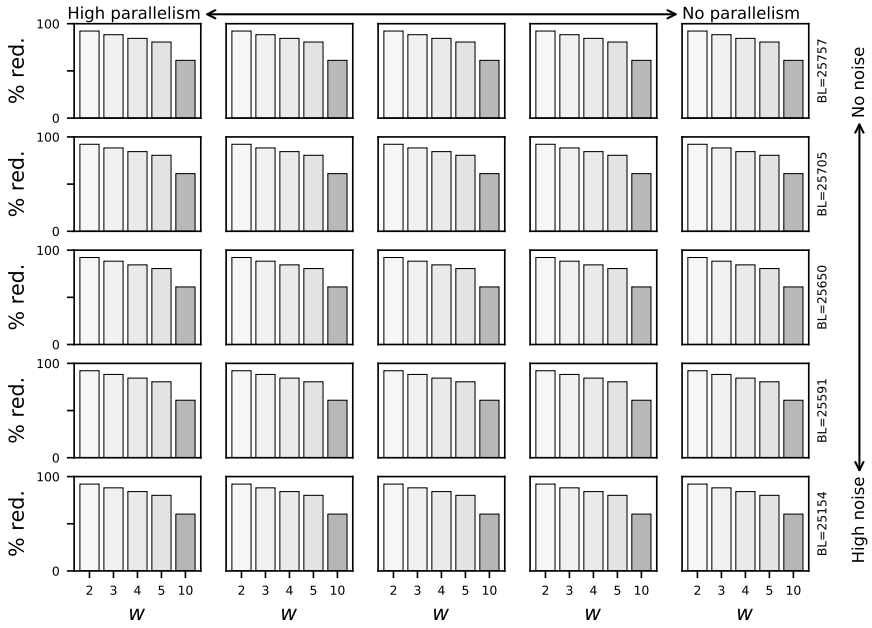



(b) Skewness of decisions level 1

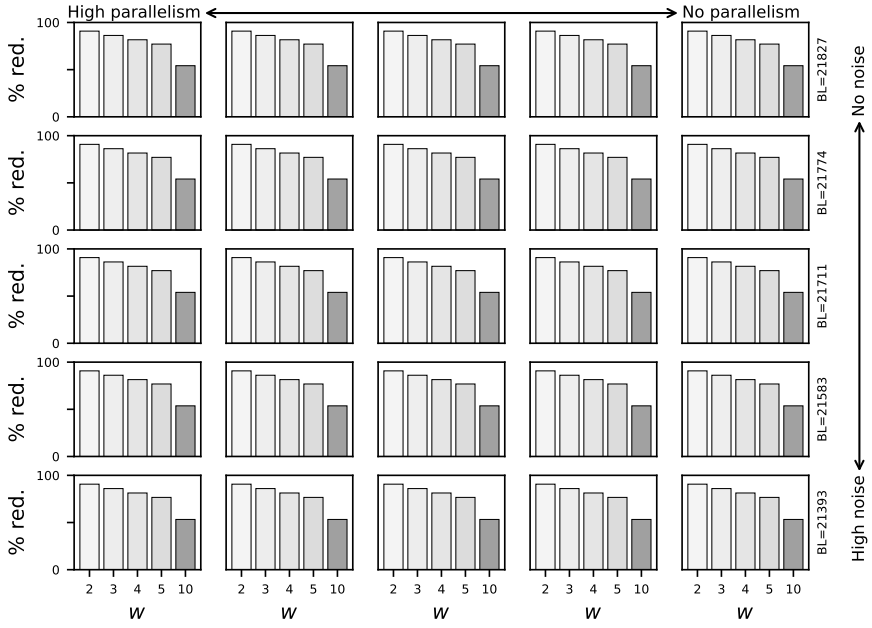



(c) Skewness of decisions level 2

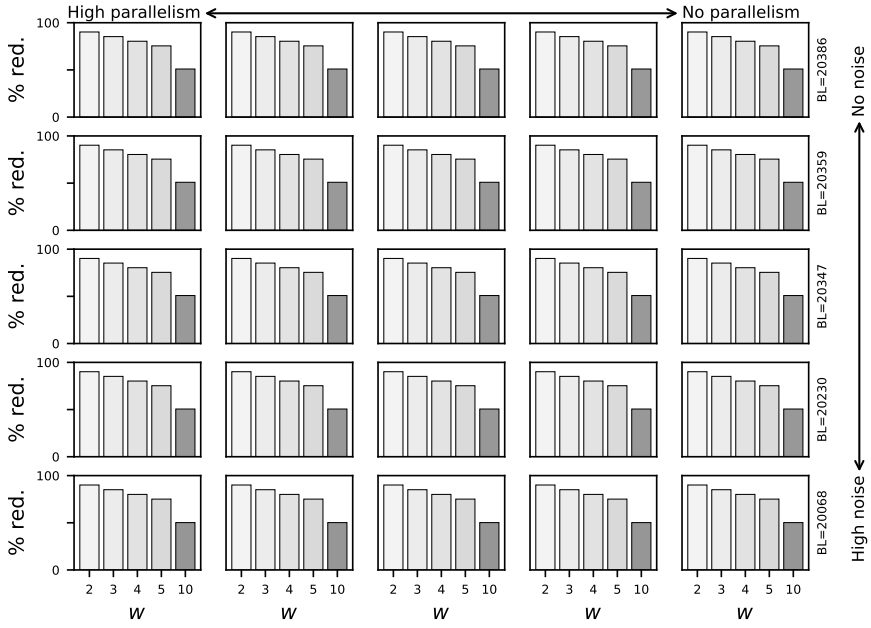
Figure 25: Percentage reduction in memory footprint w.r.t. the baseline (BL) for $a22$ event logs with different skewness of decisions and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The value $w$ on the X-axis is the maximum number of states 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

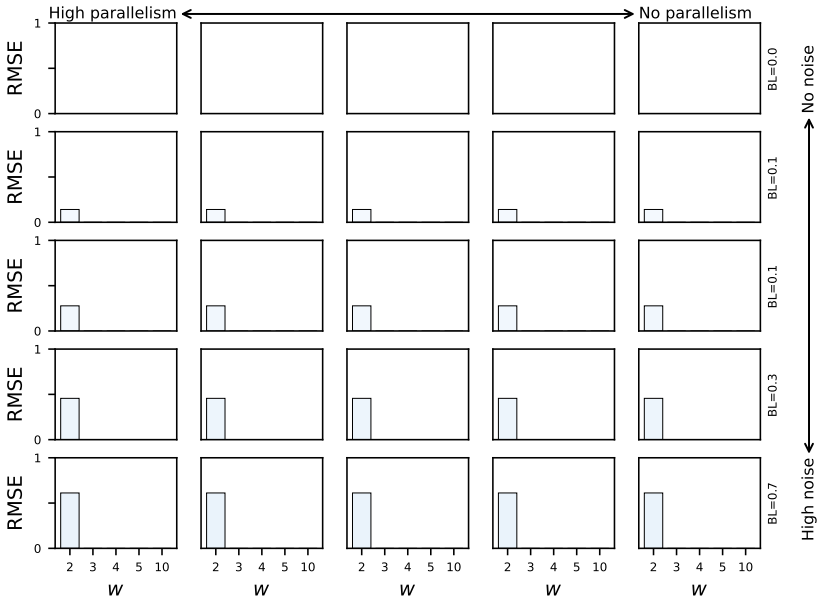



(b) Skewness of decisions level 1

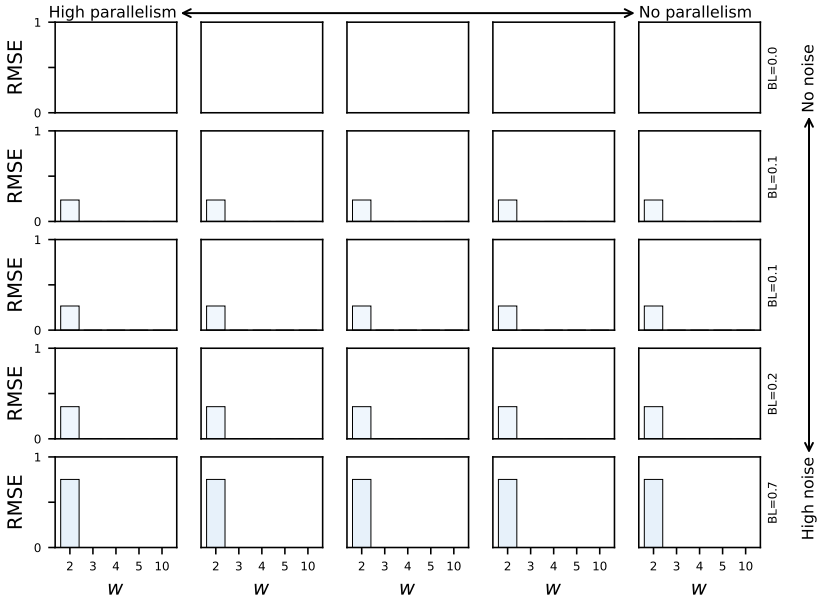



(c) Skewness of decisions level 2

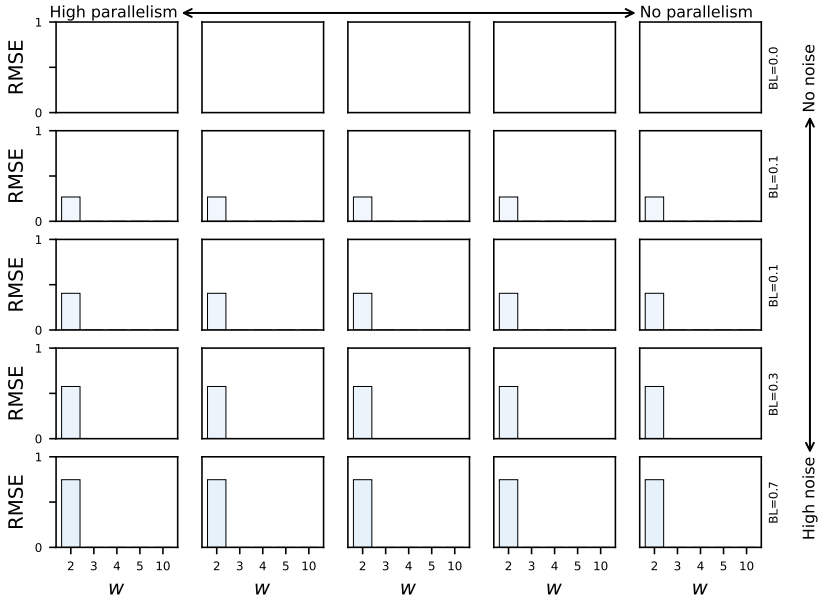
Figure 26: Percentage reduction in memory footprint w.r.t. the baseline (BL) for $a32$ event logs with different skewness of decisions and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The value $w$ on the X-axis is the maximum number of states 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

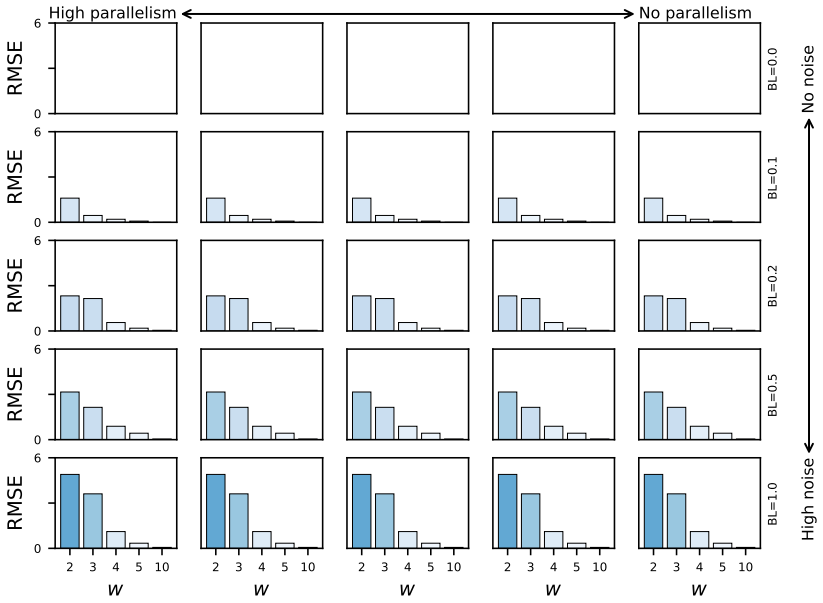



(b) Skewness of decisions level 1

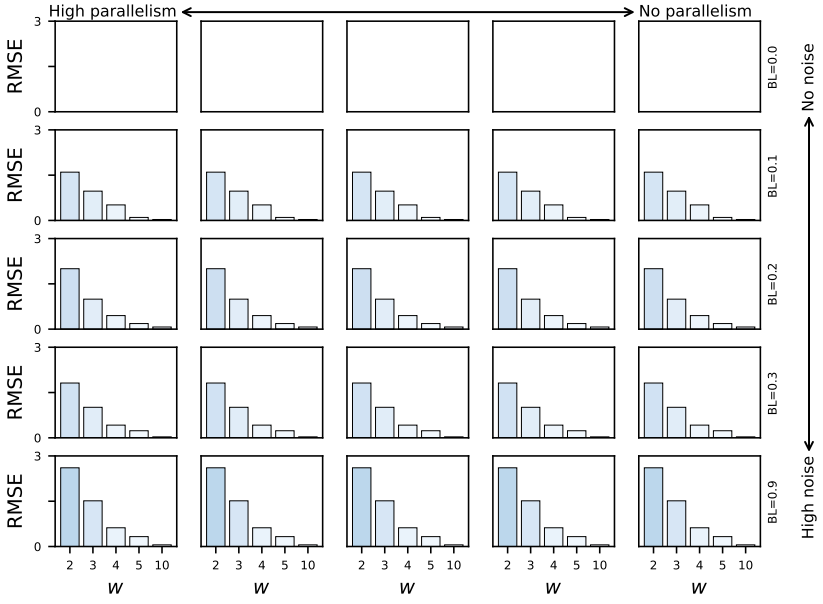



(c) Skewness of decisions level 2

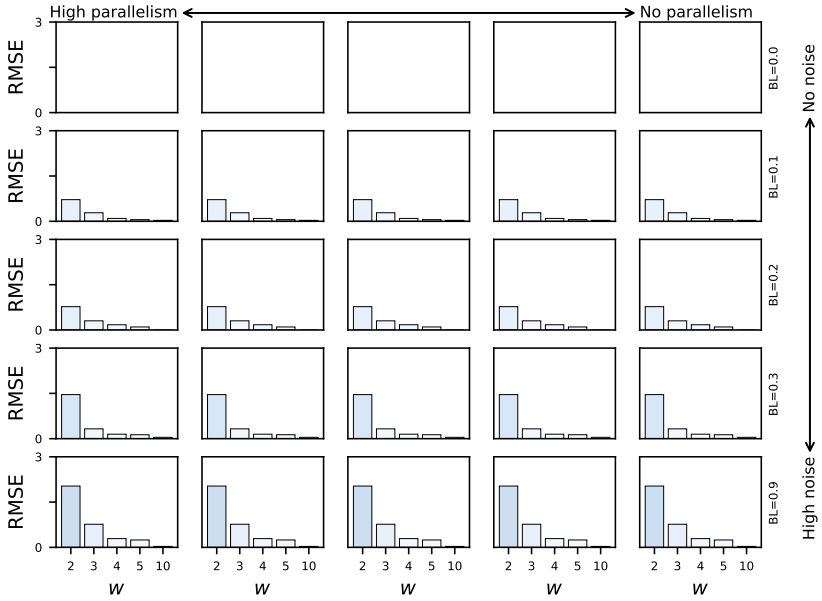
Figure 27: RMSE for $a12$ event logs with different decision skewness and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The number on the secondary Y-axis is the avg. trace fitness cost over the log by the baseline(BL).




(a) Skewness of decisions level 0

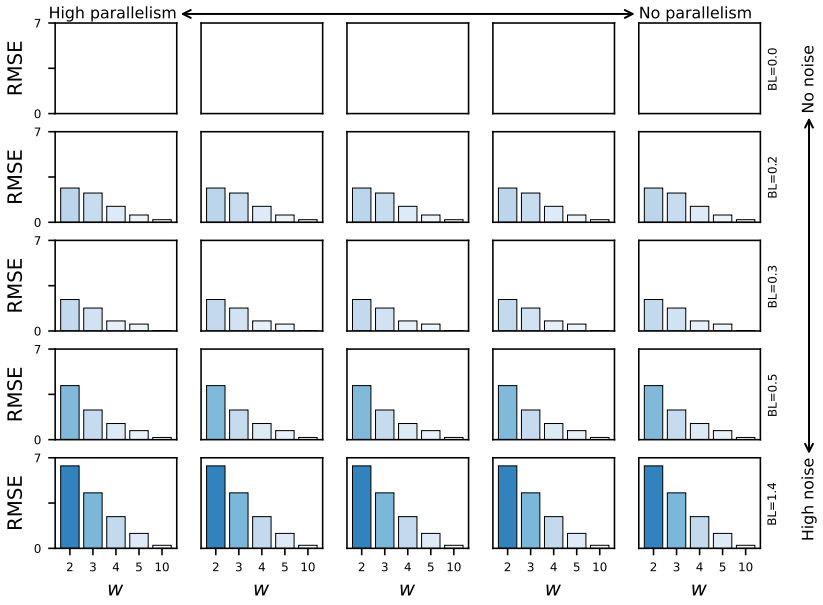



(b) Skewness of decisions level 1

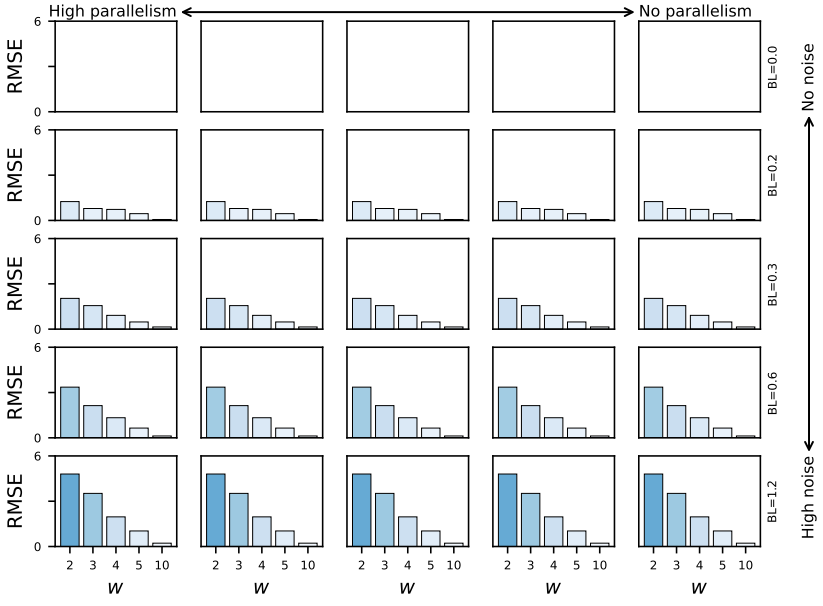



(c) Skewness of decisions level 2

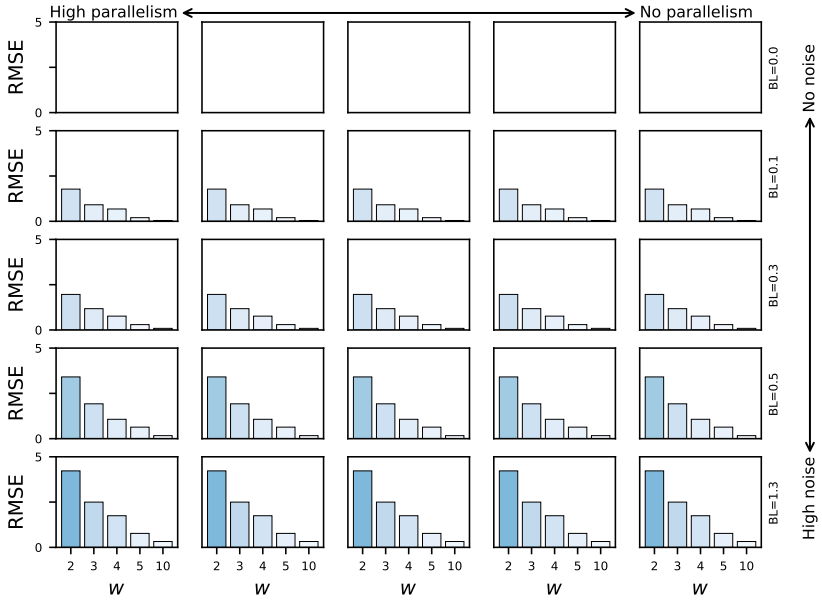
Figure 28: RMSE for $a22$ event logs with different decision skewness and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The number on the secondary Y-axis is the avg. trace fitness cost over the log by the baseline(BL).




(a) Skewness of decisions level 0

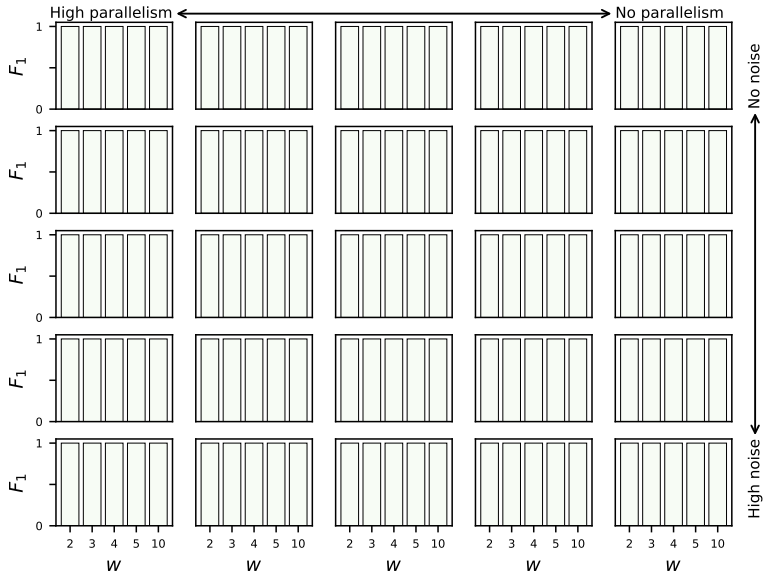



(b) Skewness of decisions level 1

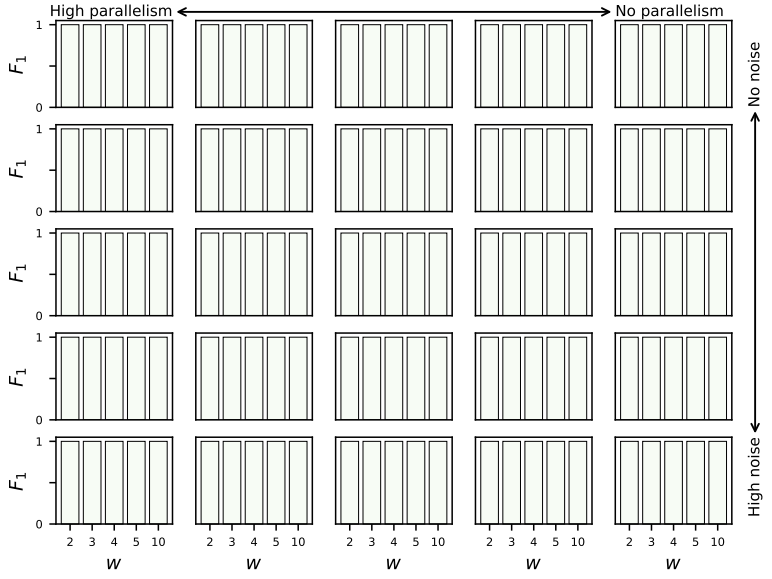



(c) Skewness of decisions level 2

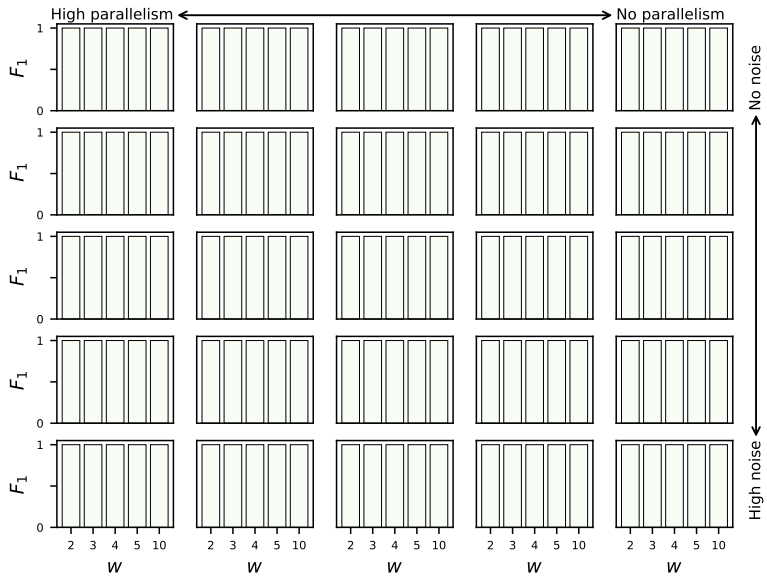
Figure 29: RMSE for $a32$ event logs with different decision skewness and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values. The number on the secondary Y-axis is the avg. trace fitness cost over the log by the baseline(BL).




(a) Skewness of decisions level 0

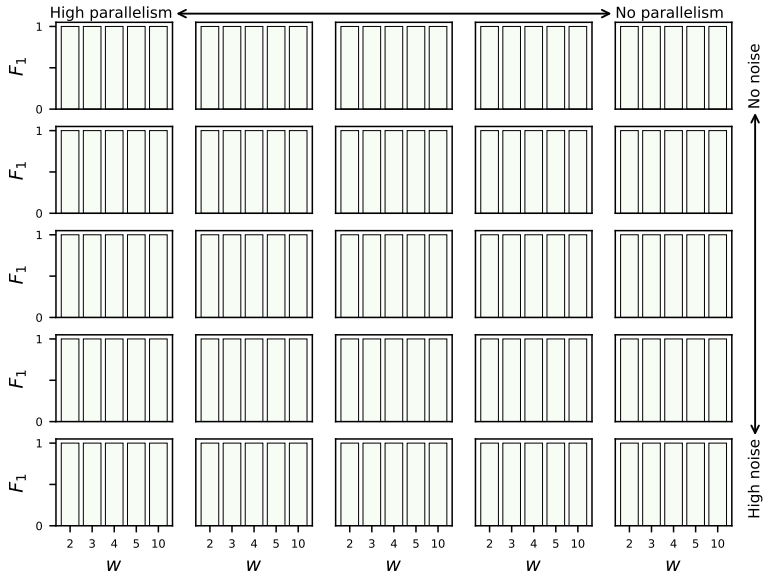



(b) Skewness of decisions level 1

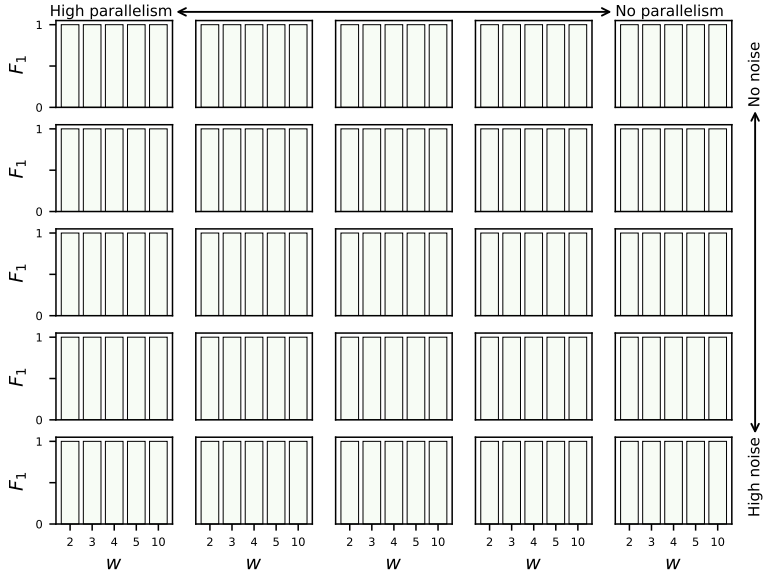



(c) Skewness of decisions level 2

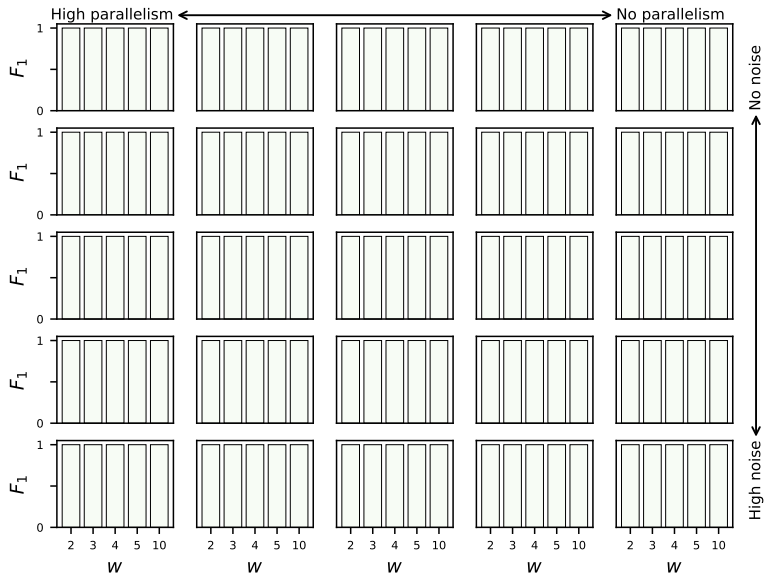
Figure 30: $F_1$ for $a12$ event logs with different decision skewness and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values.




(a) Skewness of decisions level 0

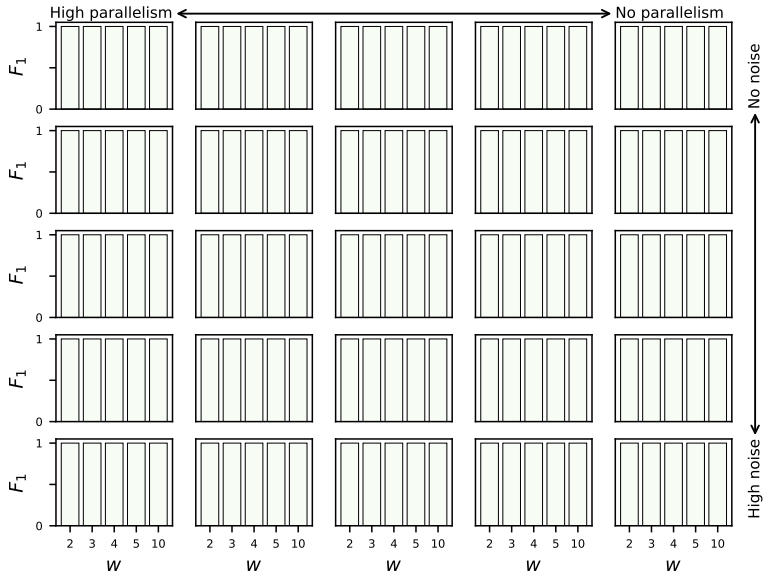



(b) Skewness of decisions level 1

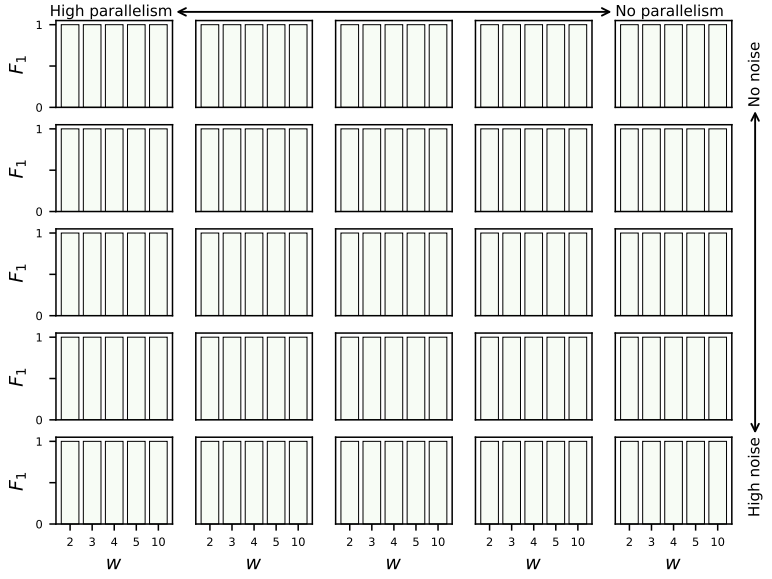



(c) Skewness of decisions level 2

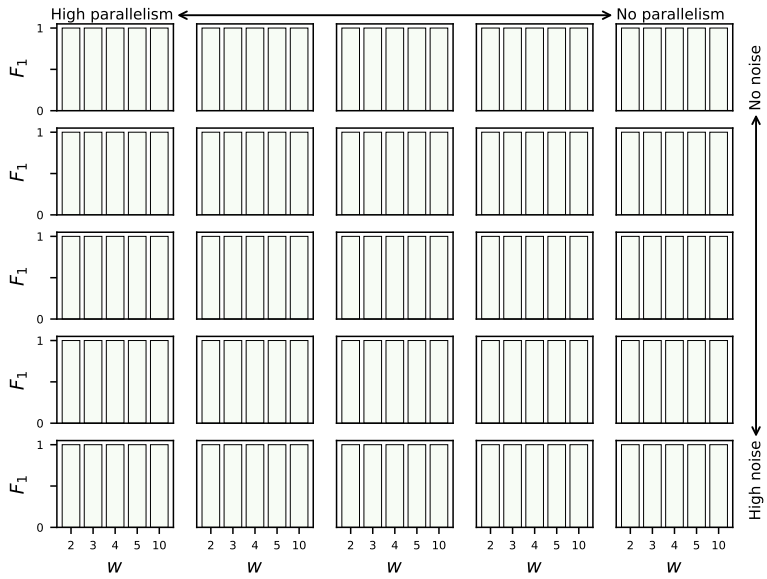
Figure 31: $F_1$ for $a22$ event logs with different decision skewness and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values.




(a) Skewness of decisions level 0




(b) Skewness of decisions level 1




(c) Skewness of decisions level 2

Figure 32: $F_1$ for $a32$ event logs with different decision skewness and noise levels with $CFs$ as a heatmap. A dark color represents the worst value of the respective metric, while brighter colors encapsulate its best values.