

Project 2 Report

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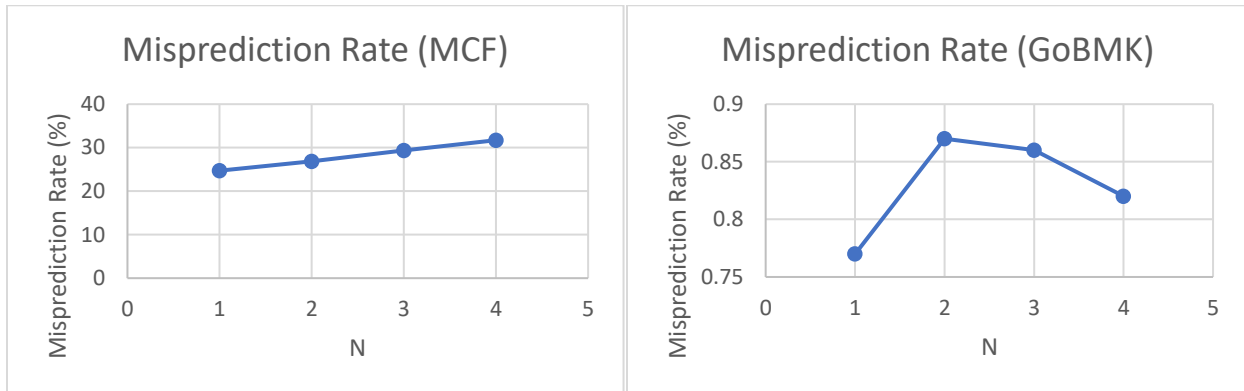
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EEL 4768: Computer Architecture

Due Date: April 17th, 2023

Part A – Analyzing misprediction rate with a variable N parameter.

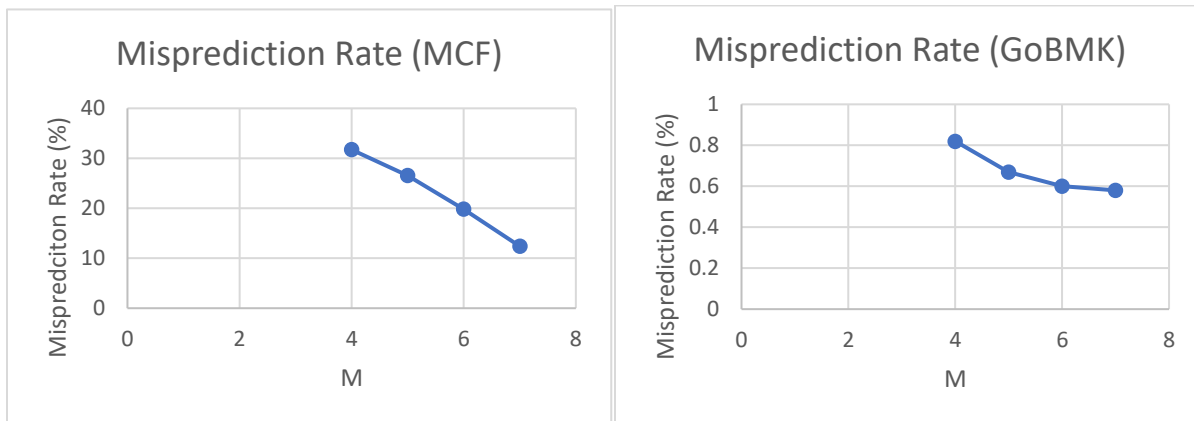
For this portion, M is set to 4, and N is varied from 1 – 4.



The overall MCF file has traces that are at a higher probability of being mispredicted, in comparison to GoBMK. This is evident in the mean values of MCF being approximately 30%, where GoBMK is only about 0.85%. Varying N with these different files shows that a GHR with more bits is detrimental to files like MCF, but can trend towards being helpful for files like GoBMK.

Part B – Analyzing misprediction rate with a variable M parameter.

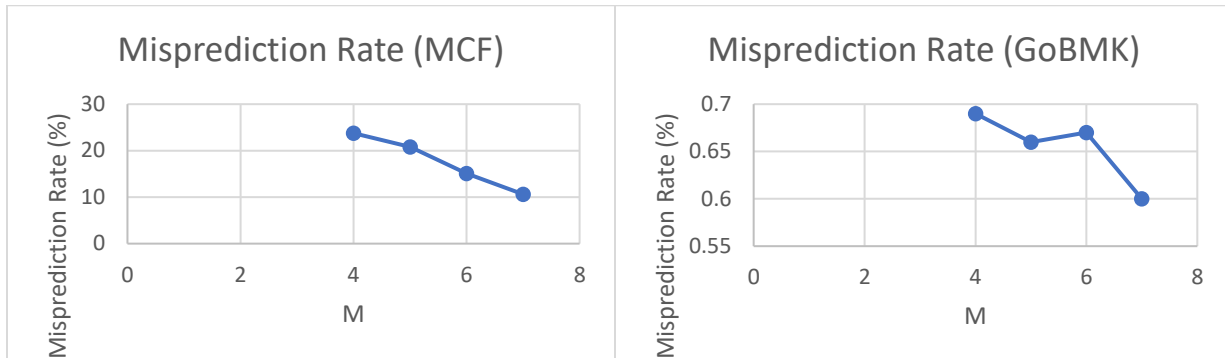
For this portion, N is set to 4, and M is varied from 4 – 7.



In this situation, increasing M helps with both files. However, files with a high likelihood of midprediction, such as MCF, have a nearly linear benefit. The GoBMK file however, suffers from only a logarithmic benefit.

Part C – Analyzing misprediction rate with a variable M parameter, where N equals 0.

For this portion, N is set to 0, and M is varied from 4 – 7.



In the situation where N equals 0, a bimodal branch predictor is synthesized. This type of predictor is more volatile than the results shown in part B. However, there are benefits. In comparing the GoBMK graphs, part C shows a trend closer to linear, without considering the outlier when M = 6. A linear trend is much more beneficial in the long run than a logarithmic trend.