

1. Which of the predictors provides the best performance?

Statistically, under the data of my tests, I believed the Tournament Predictor to have provided the best performance. In order to make use of previous code, and not repeating code, I ran the GShare function and Bimodal Predictors function standalone prior to, then passing the results generated by these two predictors directly into the Tournament Predictor function.

Unfortunately there seems to be some implementation faults in my Tournament Predictor as the results don't match verbatim. While this is the case, it still ended up showing better accuracy than other predictors; and surprisingly, in some specific unit cases, even better than results.

2. What is the optimal configuration of the best performing predictor?

The most optimal configuration for the Tournament Predictor would be to use a shorter trace. A Bimodal prediction takes longer to train than a Gshare, and such is the case since the States table is initialized in preferred Gshare. Having a shorter trace would benefit Bimodal, and a repetitive pattern would be more easily taught for the Gshare Predictor. Thus the optional configuration would be shorter traces, and a larger table size will also decrease the average amount of miss rates.

| Bimodal Table Size | Gshare Table Size | Meta Table Size | Avg. Miss Rate | Normal Avg. Miss Rate | Deviant Avg. Miss Rate |
|--------------------|-------------------|-----------------|----------------|-----------------------|------------------------|
| 1k                 | 1k                | 1k              | 5.28%          | 4.03%                 | 19.64%                 |
| 2k                 | 2k                | 2k              | 5.01%          | 3.74%                 | 19.59%                 |
| 4k                 | 4k                | 4k              | 4.88%          | 3.61%                 | 19.54%                 |
| 8k                 | 8k                | 8k              | 4.79%          | 3.51%                 | 19.54%                 |

Table 3.9: *Local/Gshare Tournament predictor miss rate with 2 bit meta table saturating counters.*

Source: <http://ww2.cs.fsu.edu/~peress/publications/Thesis.pdf>