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Statistics Explanation for Assignment 4 Part E

The summary statistics will depend on the input to the program, and the program itself. Here, we only tested one program so many of the summary statistics are very similar. For example, although there are trends within the "Instruction Statistics" section, every column of a specific instruction type is within 6% of all the other columns of that instruction type. We also see similar results in the other sections. I believe much of this is because our program is not very big, thus not many different "paths" are taken in comparison to a larger program with more diverse inputs which it can handle. I also think it's because we are testing the same program. I imagine a different program could result in very different percentages of instruction types. That said we do notice some more substantial differences within a row of the Mars statistics. I notice that as the input gets larger, the number of "arithmetic and logic unit" instructions decrease, and largely they appear to be distributed to the "branch" and "other" types of instructions. This makes me wonder if perhaps there is a larger percentage of "ALU" instructions in the main part of the code which calls the procedures. If that was the case, as the program spends more time in the procedures themselves, it will use more "branch" instructions and the total percentage of "ALU" instructions would approach the percentage of "ALU" instructions in the procedures. Another notable observation is that "4-way set associative" and "Fully associative" appear to be the best cache structures, but as the size of input increases, the cache is generally less effective. Lastly, we notice in the "BHT Prediction" section that the "Median" and "Worst" precision increases as data sets get larger for this program.