**To Run Program**

The program is written in Java and takes three input arguments. To run the program, perform the following;

1. Open windows terminal and cd to the proper file directory that holds the .java source file.
2. Once in the proper directory, run “javac sim.java” to compile the program.
3. Then run “java sim” followed by the three arguments
   1. For Example;
      1. java sim gshare 8 5 mcf\_trace.txt
4. It should now run and after approx. 5 seconds it should spit out the outputs.
5. Please ensure the mcf\_trace/gobmk\_trace is in the same file directory as the sim.java file

**BenchMarks**

* 1. M = 4, N = 1
     1. MCF Misprediction rate: 24.71%
     2. GoBMK Misprediction rate: 0.77%
  2. M = 4, N = 2
     1. MCF Misprediction rate: 26.86%
     2. GoBMK Misprediction rate: 0.87%
  3. M = 4, N = 3
     1. MCF Misprediction Rate: 29.36%
     2. GoBMK Misprediction rate: 0.86%
  4. M = 4, N = 4
     1. MCF Misprediction Rate: 31.72%
     2. GoBMK Misprediction rate: 0.82%
  5. M = 4, N = 4
     1. MCF Misprediction rate: 31.72%
     2. GoBMK Misprediction rate: 0.82%
  6. M = 5, N = 4
     1. MCF Misprediction rate: 26.54%
     2. GoBMK Misprediction rate: 0.67%
  7. M = 6, N = 4
     1. MCF Misprediction Rate: 19.81%
     2. GoBMK Misprediction rate: 0.60%
  8. M = 7, N = 4
     1. MCF Misprediction Rate: 12.40%
     2. GoBMK Misprediction rate: 0.58%
  9. M = 4, N = 0
     1. MCF Misprediction rate: 23.76%
     2. GoBMK Misprediction rate: 0.69%
  10. M = 5, N = 0
      1. MCF Misprediction rate: 20.83%
      2. GoBMK Misprediction rate: 0.66%
  11. M = 6, N = 0
      1. MCF Misprediction Rate: 15.07%
      2. GoBMK Misprediction rate: 0.67%
  12. M = 7, N = 0
      1. MCF Misprediction Rate: 10.63%
      2. GoBMK Misprediction rate: 0.60%

From these results, you can see that the MCF trace has a higher misprediction rate when N is locked in at 4 rather than when N is 0 and M is varied. With the GoBMK trace, you notice that the misprediction rates are pretty similar between N being 4 and N being 0 while M is varied. You can even some cases where there is a higher misprediction rate when N is 0 compared to M being 4.