

COMPENG 4DK4 Lab 3 Report

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Random Number Generator Seeds

For the experiments in this lab, we used the same set of 18 random number seeds for all experiments. Experiment 2 instructs us to include runs with our *McMaster Student ID numbers* as our seeds. We used our *McMaster IDs* and shifted them by one digit at a time to create 9 different seeds from each our IDs, for a total of 18 different seeds. All the random number generator seeds can be seen in Table 1. In the C code used for the experiments, leading zeroes are removed.

400188200	400190637
001882004	001906374
018820040	019063740
188200400	190637400
882004001	906374001
820040018	063740019
200400188	637400190
004001882	374001906
040018820	740019063

Table 1: Random Number Generator Seeds

Experiment 2

When plotting these results with the Erlang B formula in MATLAB, we observe the same results with essentially identical curves as seen in Figure 2. The MATLAB code used to calculate the Erlang B formula can be seen in Listing 1. We compared several of our results of from our program with an [online Erlang B calculator](#) and had matching results. For example, for $A = 5$, $N = 10$, both calculated $P_B = 0.184$.

Listing 1: Erlang B Formula

```
3 syms k
4
5 for A = 1:20
6     for N = 1:20
7         PB(A,N) = ((A^N)/factorial(N))/symsum(A^k/
8             factorial(k),k,0,N);
9     end
end
```

Experiment 3

To determine the maximum offered loading (in Erlangs) for any given number of cellular channels, we

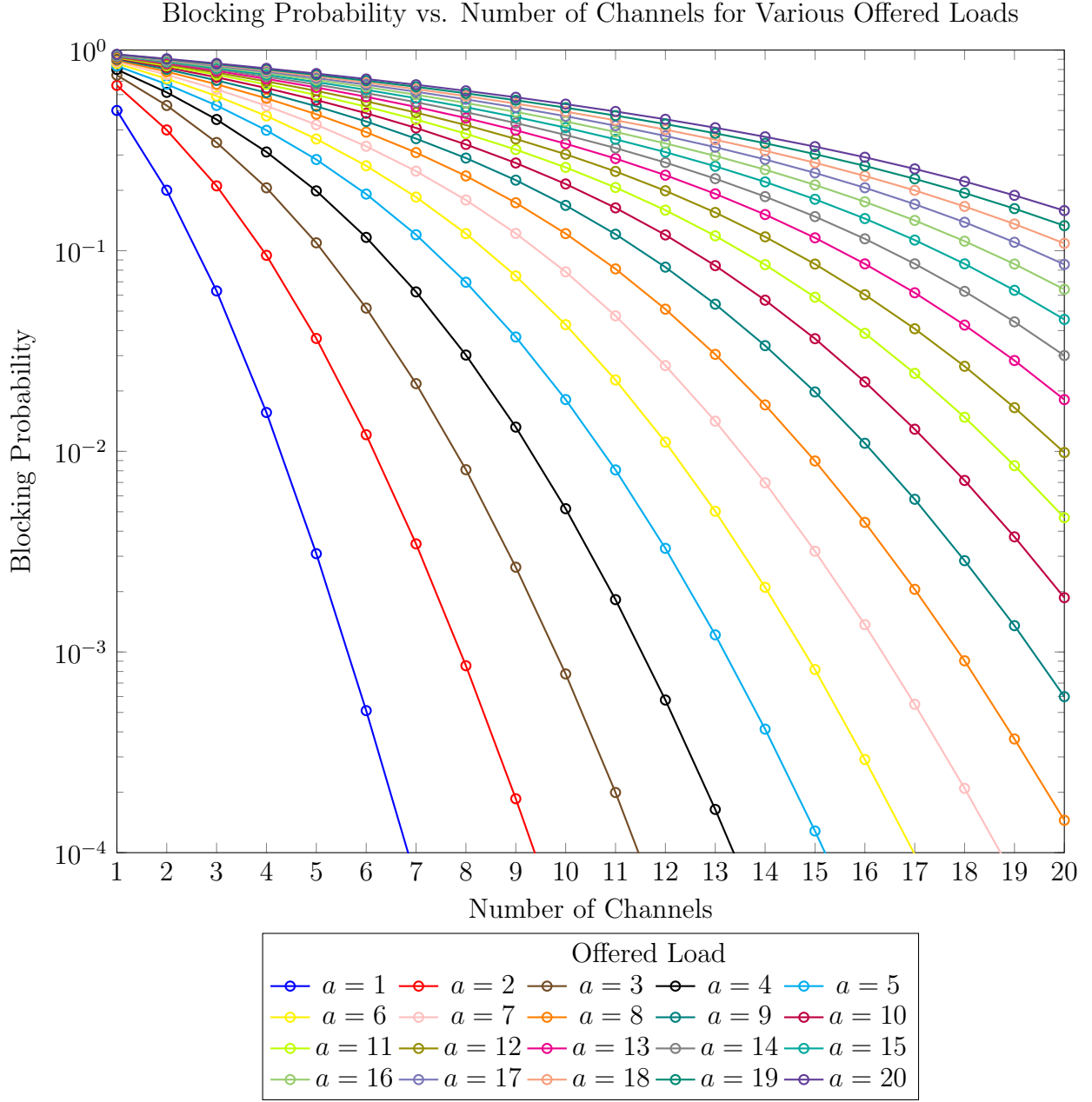


Figure 1: Experiment 2: Simulation

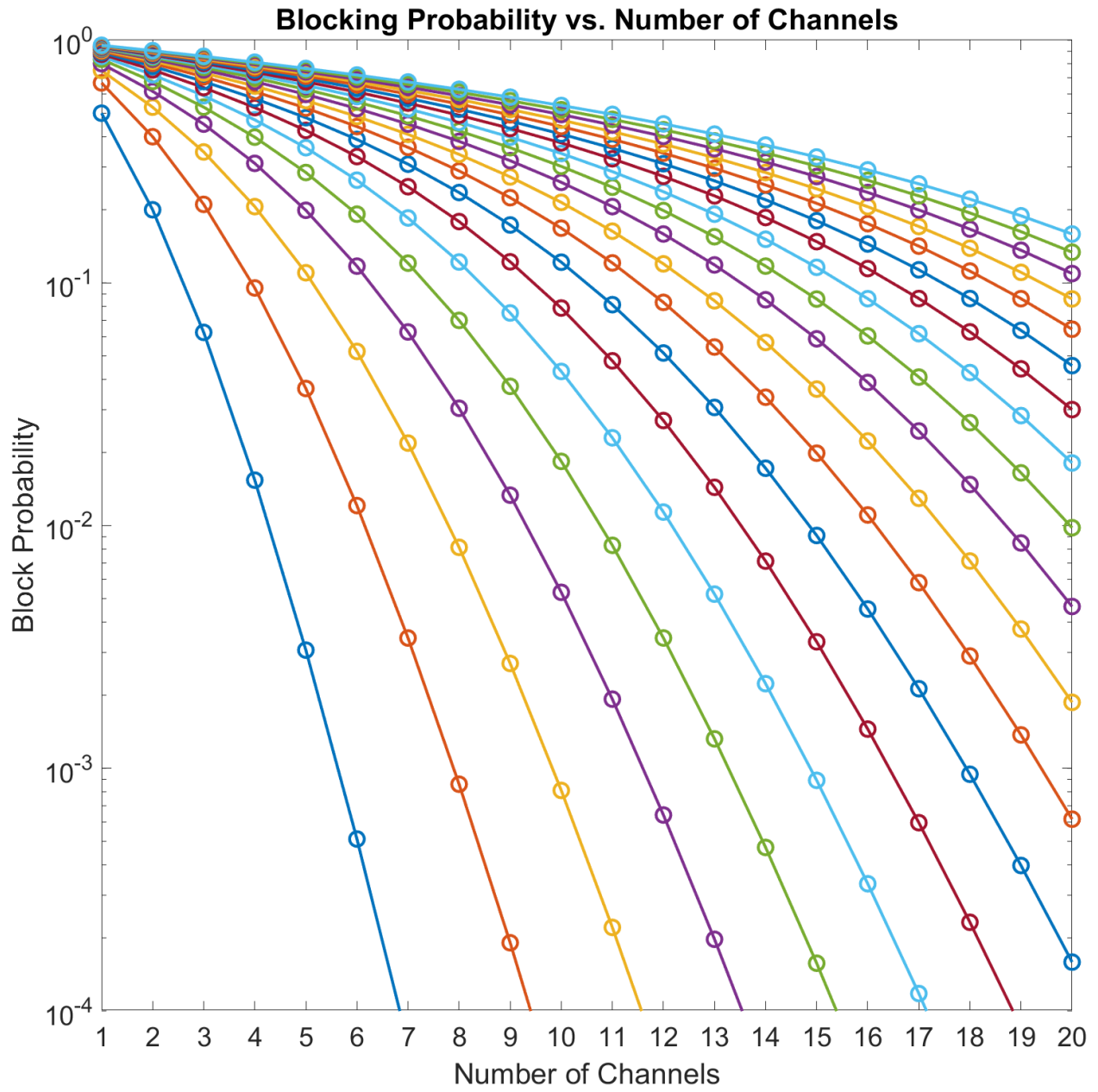


Figure 2: Experiment 2: MATLAB