1. The two generic functions can be found at line 65 and line 91. Other changes include line 109 – line 123, where I created struct for Batch1 and Batch2; line 166, where I initialized a vector to store the option values; line 199, where I push the current option value into the option value vector; and line 204 – line 215, where I calculate and print the current standard deviation and standard error every 5000 iterations.
2. In general, I found that the standard deviation does not change much as we increase NT or NSIM, while standard error decreases as NSIM increases. I think this is good indication of a relatively precise measurement. If we look at the formula of standard deviation, we will notice that as NSIM increases, both the denominator and nominator increases. Therefore, we should expect the standard deviation to remain at a certain level when we increase NSIM. Standard error, on the other hand, is expected to decrease overtime since M increases and standard deviation remains at the same level. My result matches this statistical expectation, which is good news. It indicates that our confidence of saying the data’s spread is stable increases as NSIM increases. We observe that for Batch1 Call, the standard deviation remains around 4.9 and standard error approaches to 0 as we continue to increase NSIM. Batch1 Put’s standard deviation remains around 8.4, and standard error decrease to nearly 0 as we continue to increase NSIM. Batch2 Call’s standard deviation remains around 15.4, and standard error approaches to 0 as NSIM increases. Batch2 Put’s standard deviation remains around 13.1, and standard error decreases to nearly 0 as NSIM continue to increase.

To sum up, NSIM and NT are independent from SD, while SE continue to decrease as NSIM increases. This indicates that our confidence interval of measurement precision increases as our sample size increases.