For the two-sample hypothesis test I chose to take a closer look at underlying distribution for different random number generators. Without having information about the underlying distribution we are going to say something about the difference in distributions and thus follows our research question:Are both samples drawn from the same underlying distribution? In terms of $H$:

$$H_0 : P_0 = P_1, H_1 : P_0 \neq P_1$$

where $P_i$ is the distribution of sample $i$. We are required to use at least one non-parametric technique to get some information about our distributions. That is why we perform a Two-sample Kolmogorov-Smirnov test [1] to determine if the two underlying distributions differ. The test uses the two empirical distribution functions of both samples and a supremum function. This supremum function takes as input the difference between the two empirical distirbution functions and returns the least upper bound of this data. The other technique that is used is the two-sample $t$-test [2] to compare the means of both distributions.

# Bibliography

[1] *Kolmogorov-Smirnov test.* https://ocw.mit.edu/courses/mathematics/18-443-statistics-for-applications-fall-2006/lecture-notes/lecture14.pdf. Accessed: 12-11-2017.

[2] *Two-Sample T-Test.* https://ncss-wpengine.netdna-ssl.com/wp-content/themes/ncss/pdf/Procedures/NCSS/Two-Sample_T-Test.pdf. Accessed: 12-11-2017.