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Addressing discrete mathematics problems in the classroom

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The TI-Nspire CX CAS calculator is mandatory in all mathematics courses at École de technologie supérieure. Every student has a handheld device in the classroom and can use it in real time. Making students work actively in the classroom is an effective way for improving their knowledge and understanding of the concepts.

The compulsory course Logic and Discrete Mathematics (MAT210) is given to software engineering students. Using a CAS in this course enables the teacher and the students to explore more complex examples. For instance, students can manipulate large prime numbers in the study of the RSA cryptographic system, or solve recurrence relations related to counting problems. We study, among other topics in this course, the complexity of algorithms.

In this talk, we will present our approach to handle this notion. Using Nspire, students are guided in the implementation of several algorithms to solve the same problem. In order to measure the time complexity (using the big-O notation), they run the algorithms on samples of different size and plot the results. This leads to a better understanding of the big-O notation, which is then confirmed algebraically using the handheld device.

References

[1] K. ROSEN, *Discrete Mathematics and Its Applications*. McGraw-Hill, New York, 2012.

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