The Value of Computational Thinking in Statistics Education

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Abstract:

In a seminal paper, Nolan and Temple Lang (2010) argued for the fundamental role of computing in the statistics curriculum. In the intervening decade the statistics education community has acknowledged that computational skills are as important to statistics and data science practice as mathematics. There remains a notable gap, however, between our intentions and our actions.

To understand that gap, together with Nick Horton, we assembled a collection of papers for a special issue of the Journal of Statistics and Data Science Education (2021) focused on what has changed over the last ten years with respect to computing in the statistics curriculum. Broadly, the collection of papers (1) suggest creative structures to integrate computing, (2) describe novel data science skills and habits, and (3) propose ways to teach computational thinking.

In this talk, I describe the special issue with particular focus on the last of the three aspects: the role of computational thinking: The computer as part of the thinking process and not only a tool for implementing mathematical theory.

Keywords:
algorithmic thinking; multivariable thinking; modern curriculum; data visualization; integrating computing