

MathWorks Math Modeling Challenge (M3 Challenge) 2025

A Tale of Two Crises: The Housing Shortage and Homelessness

Heat waves are not only occurring more frequently, but they are growing more intense, lasting longer, and spreading across broader periods of the year—an alarming trend that has persisted for more than 50 years. Despite advancements in technology, the high energy demand during heat waves can put significant strain on the electrical grid, often resulting in widespread loss of electricity. Without electric power, homes and businesses lose the ability to stay cool, while critical infrastructure—like communication networks, hospitals, and transportation systems—struggle to function. These issues were all part of this year’s MathWorks Math Modeling Challenge. Over a long weekend in late February / early March, 794 teams composed of more than 3,600 students worked on solution papers of up to 20 pages, competing for \$100,000 in scholarships in [MathWorks Math Modeling Challenge \(M3C\), a program of SIAM](#).¹

M3 Challenge is a unique, internet-based math competition that provides a transformative, real-world experience for high school students in the United States and sixth form students in the United Kingdom, giving them the opportunity to demonstrate how the math they learn in class can be used to solve real problems. Now in its 20th year, M3 Challenge has awarded more than \$2 million in scholarships since its launch in 2006.

A program of Society for Industrial and Applied Mathematics (SIAM) and sponsored by leading software developer MathWorks, M3 Challenge seeks to make math relatable to everyday life and to inspire students to study and pursue careers in applied math, computational and data sciences, and technical computing. Free of any entrance or participation fees, M3 Challenge has drawn the participation of more than 65,000 students (one third female), 4,000+ high schools, 6,000+ teachers, and 400+ Ph.D.-level judges.

Working in teams of three to five members under a 14-hour time constraint, participants use the mathematical modeling process, as well as other skills and experiences, to understand and define a particular problem, gather data and information, document their assumptions, and devise a math model to make predictions and provide insight for decisions about the issue before submitting their solution via online upload. The specific real-world problem that is posed each year is unknown to participants until they log in during Challenge weekend. Teams may opt to use technical computing to advance a model or better reveal its implications, and extra credit awards exist for outstanding work in that area.

After four rounds of rigorous judging by more than 120 professional applied mathematicians over the eight weeks immediately following Challenge weekend, six finalist teams and three technical computing awardees are selected to present their solutions to a panel of mathematical experts⁷ in

¹ Please see the 2025 M3 Challenge [problem statement](#) for what teams downloaded on Challenge weekend.

New York City on the last Monday in April. The 2025 presentations are [viewable on YouTube](#). 37 teams were recognized with scholarship prizes starting at \$1,000; the Champion team received \$20,000.

The following is the Champion team's paper from the MathWorks Math Modeling Challenge 2025 with some reviewer suggestions incorporated.

Complete information about MathWorks Math Modeling Challenge, including an archive with problems, solutions, and judge perspectives from each Challenge year, is available at <http://m3challenge.siam.org>.