



Moody's Mega Math Challenge 2010

A contest for high school students

SIAM
Society for Industrial and Applied Mathematics
3600 Market Street, 6th Floor
Philadelphia, PA 19104 USA
M3Challenge@siam.org
M3Challenge.siam.org



Making Sense of the 2010 Census

to count or not to count, that is the question...

The U.S. Constitution requires apportionment of the U.S. House of Representatives every ten years by population of the respective states, as determined by a census (*Enumeration*, as stated in the Constitution). Congress is responsible for choosing the methodology for conducting the census and for selecting an apportionment method. Each state defines its own Congressional districts.

In many places, there was a significant undercount in the 2000 census figures. Because of the political ramifications of the final count, there is considerable interest in the adjustment for the undercount and its effect upon apportionment.

As the 2010 census begins, Congressional leaders have asked your team to provide mathematically-based recommendations for adjusting the population figures for the census, selecting an apportionment method, and offering suggestions to the states for redistricting.

Your report should answer the following questions:

1. Should the census figures be adjusted for the undercount? If so, how? If this solution introduces errors of its own, estimate how large they are, compared to the undercounts.
2. What method should Congress select for apportioning the House of Representatives? Why is this method superior to others for dealing with this issue?
3. What recommendations should be made to the states to ensure that Congressional districts are fairly drawn? Justify these recommendations.

Your one-page summary should be clear, concise, and free of technical jargon. Justify your conclusions by citing data from the 2000 census, wherever possible. Reference all sources and data that are used to make your decision. The judges will award the highest scores to creative solutions based on well analyzed mathematical models.

The following web sites might be helpful:

<http://www.census.gov/prod/2001pubs/c2kbr01-7.pdf>

<http://www.census.gov/dmd/www/pdf/Report21.PDF>

<http://www.census.gov/prod/cen2000/doc/sf1.pdf>

<http://www.census.gov/pred/www/rpts/L2.pdf>

