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Math 433: Mathematical Modeling

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[Loretta Pettway Bennett and Gee's Bend Quilters](#)

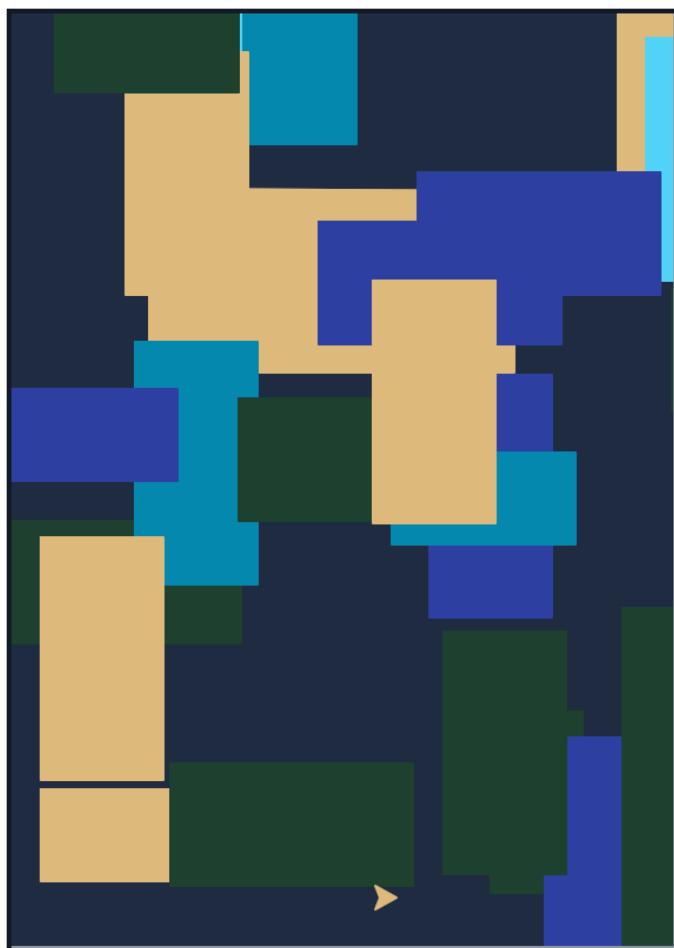
The Gee's Bend quilters are an intergenerational collective of Black women in Alabama who have made textile art since the early twentieth century. The quilts made by Gee's Bend artists are often improvisational – known as “my way” quilts – that feature irregular patterns, highly stylized forms, and unique colorways. Our artist of choice is Loretta Pettway Bennett. Loretta Pettway Bennett (1960–) was first introduced to sewing at the age of five by her mother and grandmother. In reference to sewing, an activity passed down through the women in her family, Pettway Bennett has remarked, “I believe the seed of quiltmaking was planted into my genes.” Growing up, she first pieced together quilts through leftover scrap fabric. She later was introduced to different quilting techniques such as tacking and applique. Having traveled with her husband through his deployments with the Army, she cites much of her artistic inspiration as coming from the different places she’s visited. In Blankenheim, Germany, she saw, “white and black-trimmed houses [...] decorated with flower boxes of red geraniums and pansies.” In El Paso, Texas, she noticed arrays of “red and green chili peppers” and “clothing and cars [in] bright yellow, orange, pink, and purple colors.” In White Sands, New Mexico, she took stock of “the most beautiful, breathtaking mounds of nothing but white sand.” With an appreciation for vivid colors and crisp, geometric patterns, collected over a lifetime of relocations, Loretta Pettway Bennett carries on a tradition of quiltmaking that has been integral to her own experiences of family and migration.

Inspired by the quilts of Loretta Pettway Bennett, we wanted to create art modeled from her work. We first used an HTML color picker to extract the HTML color codes from three of her quilts – “Blues,” “Blocks and Strips,” and “Sandy Hill Lazy Gal.” These color codes became the palettes we used in our project. For “Blues” and “Blocks and Strips,” we used the Python “turtle” module to write an algorithm that randomly draws a set number of rectangles of various random sizes and colors within a bounded area. These colors are randomly chosen from the relevant color palette. For “Blocks and Strips,” we ran this algorithm twice to create two “mini quilts” on the top and bottom halves of the area. These halves are connected by a horizontal gray line across the middle – coded as a skinny, rectangle – to be a truer approximation of the original quilt. For “Sandy Hill Lazy Gal,” we wrote a different algorithm that still uses rectangles randomly colored from the palette but in a more structured manner. We can think of the quilt as being divided into three vertical sections from the left. In the first vertical section, the algorithm draws five columns of a preset width and height; it then divides each column space horizontally at a random height. Each column is thus composed of two randomly colored rectangles of different heights stacked on top of each other. For the second section of the quilt, the algorithm

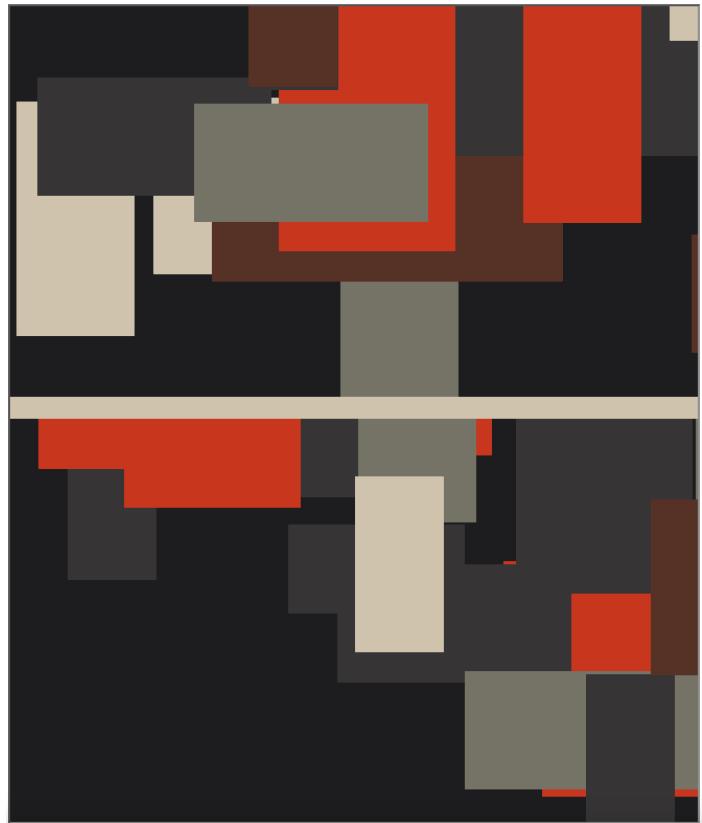
essentially does the same thing in miniature, alternating between columns and rows. It draws the following shapes in succession from bottom to top: four shorter rows of the same height, where each row is composed of two randomly colored and sized rectangles; four similar columns on top of the rows; a blank square on top of the columns; and finally, four more similar horizontal rows to fill the second vertical section of the quilt. The last section of the quilt is filled with seven columns in the exact same manner as the first five columns. Some limitations of our methods include that randomly generated rectangles can overlap each other, which would not be the case in a real quilt, and that the rectangles of the same color sometimes end up next to each other due to the random color selection process, which also would not happen in the actual artwork. Some geometric simplifications were also made to the “Sandy Hill Lazy Gal” quilt to make it more codeable. However, it is our opinion that these limitations and the difficulties we had in emulating Mrs. Bennett’s quilts only serve to further speak to how talented of an artist she is. Her work is complex, unique and not easily reproduced.

If you are interested in learning more about our code, a pdf version of it is available [here](#).

Blues Quilt



Blocks and Strips Quilt



Sandy Hill Lazy Gal Quilt

