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Simulation of Birth-and-Assassination Process
Research Proposal

Background
In the paper, "The 'Birth-And-Assassination' Process", David Aldous introduced a new variant of branching process, which can be applied to discuss the asymptotic stability of a queuing process. Also, the sufficient condition for the process to be stable, meaning all the particles die out eventually, or unstable, meaning the system is persistent, was proved in that paper.
This project intends to simulate data and draw animated graphs to illustrate the dynamics of this branching process.

Methodology
The simulation will mainly be based on JavaScript and HTML. The key part will be a bubble chart visualizing the birth and death of particles. Moreover, to make the project richer and more interesting, an animated bar chart showing the quantity of particles of each generation is expected. Examples of screen shorts and animation links of these two charts can be found below. More graphs may be included once I figure them out.

Bubble Chart: https://shichangzh.github.io/BubbleChart/
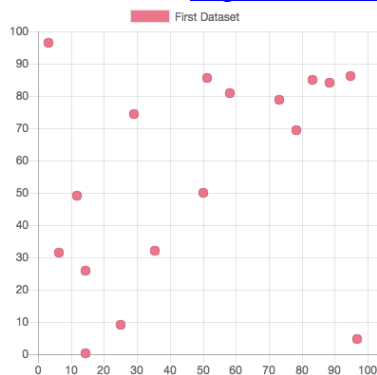
Bar Chart: https://shichangzh.github.io/BarChart/
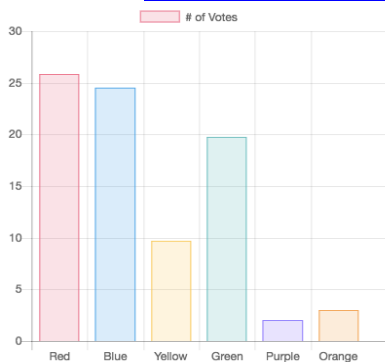
These are just crude examples to provide an intuition of what the animation would look like. I merely used random numbers to make the pictures move. However, the actual project should be more exquisite, and look good together with the Queen song :).

Besides animations, there will be a rigorous final write-up. What will be included in the write-up are simulations under different initial conditions, and also the theorem proved in the paper can be checked and visualized through the simulation process.