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The goal of this bakeoff was to decrease the average time taken to press each button in the processing application that we were given. The grid for the game consists of 16 squares, 15 of which are gray, and one of which is cyan - the "target square". The goal of the game is then to hit the target square as fast as possible (each square becomes the target square once during each game, and only after all 16 target squares are clicked is the game over). In order to decrease the average time taken, we decided to play around with changing the colors of the target square and the cursor (which is an ellipse), and adding or changing things to the grid itself.

Regarding the colors, we decided to play around with both changing the color of the ellipse as well as the target square. Initially, we decided to change the color of the ellipse (cursor) to go from red in it's usual state to green once it's hovered over the target square that needs to be clicked. Another idea, however, was to cause the ellipse to go from red to black and transparent (increasing the opacity of the color), so that the user would be able to tell when the ellipse was in the square as they could see behind the ellipse itself.

The next idea was to experiment with different flashy colors of the target square, like a bright yellow square or lighter border colors. We first decided to change the color of the target square from cyan to yellow, as we believed that yellow was a color that would be more visible against a black background. Then, however, we decided that we may want to change the color of the target square when the user is hovered over the target square. To that extent, we decided to change the color of the square to green, but to keep the yellow border.

Another idea that we experimented with was adding or changing things in the grid itself. To that extent, we experimented with changing the size of the ellipse when the user hovered over the target square (as it would be another visual cue that the user would be able to correctly click the square). We also decided to add a line from the ellipse to the target square itself, as the user would then be able to see the quickest path that they could take from where they were to the correct square.

Because we had so many ideas, we decided to run a series of experiments in order to figure out which combination of these would be the best. The results can be seen in the attached spreadsheet. There were 5 different combinations of ideas that we decided to test, and the way we tested this was by having members of our group run each combination 3 times, and take the average of those three times. What we found was that the combination that had the fastest overall average time (and the smallest standard deviation) was **having the target square change color and having a red line.** This was surprising because of the members who ran the experiments, this was not any of our fastest average. However, because the bakeoff will be held by using many different

people try out our version of the game, we felt as though this combination would perform the best, leading us to make this our final version.

	Square Changes Color and Red Line Exists	Square Changes Color	Red Line only	Ellipse Changes color and red Line	Eliipse Changes Color	
Nikki	3 trials - 0.61s, 0.64s, 0.64s	3 Trials - 0.60s, 0.59s, 0.61s	3 trials - 0.64s, 0.61s, 0.68s	3 trials - 0.60s, 0.60s, 0.68s	3 trials - 0.64s, 0.64s, 0.63s	
Nikki's Average	0.63	0.6	0.643333333333333	0.626666666666667	0.636666666666667	Fastest: C1
Senna	3 trials: - 0.71s, 0.76s, 0.69s	3 Trials - 0.68s, 0.71s, 0.73s	3 trials - 0.73s, 0.71s, 0.78s	3 trials: - 0.74s, 0.86s, 0.71s	3 trials - 0.83s, 0.79s, 0.73s	
Senna's Average	0.72	0.71	0.74	0.77	0.78	Fastest: C1
Alex	3 trials - 0.58s, 0.62s, 0.65	3 trials - 0.60, 0.66, 0.67	3 trials - 0.65, 0.68, 0.7	3 trials - 0.61, 0.63, 0.67	3 trials - 0.62, 0.62, 0.65	
Alex's Average	0.6166	0.6433	0.6766	0.63666	0.63	Fastest: F1
Shelby	3 trials - 0.76s, 0.72, 0.72	3 trials - 0.74, 0.75, 0.82	3 trials - 0.89, 0.71, 0.75	3 trials - 0.69, 0.83, 0.77	3 trials - 0.75, 0.78, 0.65	
Shelby's Average	0.73	0.77	0.78	0.76	0.73	Fastest: F1
Average Column-Wise	0.67415	0.680825	0.709983333333333	0.698331666666667	0.694166666666667	
Standard Deviation	0.059111955925458	0.0747086953886	0.061535906410629	0.077198013863341	0.073200637519992	