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We believe that the algorithm works perfectly. Our way of managing the system is the best way of doing it in our opinion, and our code executes the algorithm exactly how we expected it to. In short, our algorithm prioritizes whole locations at a time instead of individual applications. The locations are arranged in increasing order of the percent of applications that they have turned on currently. We assume that the people at the locations with less than $1/3$ of the appliances turned are not home. That being said, we try to contain our meddling to just these locations if possible. If not, we use the same approach on the rest of the locations, and if that still is not enough, we then brown out entire locations at a time using the same prioritization. Within each location, the smart appliances are arranged in decreasing order of current watts being used. The highest watt consuming smart appliance that is turned on will be turned off at the given location before moving to the next location.

In terms of doing what we wanted it to do, our algorithm is perfect. Of course, it is up for debate whether our process was best, but it is the best one that we thought of. Our algorithm is designed to continue turning off appliances, even in the worst case scenario. What we mean by this is that, if need be, we will brown out all of the locations, so if the warning wattage level is not reached, it is not the fault of the algorithm. Rather it is a problem with someone inputting a wattage that is unachievable, due to the fact that some appliances still consume some amount of wattage even when they are turned off. You could say that our algorithm uses a “wide” approach: it tries to affect a small amount of appliances across a large number of locations instead of turning off a lot of appliances at any one location. We think that this is a better approach, since the effects at each location will hardly be noticeable this way. We believe that if we interacted with many locations in a way that none of them even know about it, it is like we did nothing at all. This is better than affecting a small number of locations, but being very noticeable at each one.

As mentioned before, our design is the best one that we could think of, so there is not much we would change as far as the logic goes. One thing we think we could optimize is the “threshold” percent of appliances turned on that we use to determine whether someone is home. The number we used is $1/3$, but that is just an approximation. Our original approximation was $1/4$, but we decided that it was too low. After all, if a family is spread out across all the rooms in the house, or if it is summer and there are multiple air conditioners on at a house, that number could easily come close to $1/2$. We decided that $1/3$ would work since it is in between the other two approximations. If we were to do this in the future, we would hope to have more information about each individual household or about the time of year to better optimize the percentage that we use.