Executive Summary

The Purpose
The design goal of the project is to make a more secure pet door. Most pet doors on the market do a good job allowing the owners pet to go outside on their own while minimizing the weather coming through the door. However, this simple design also comes with its downsides. There is no security provided with these doors, basically allowing a free entrance for wild animals or even neighbors pets. The purpose of the project is to find a solution for a more secure door while maintaining a cheap price and a good experience for the pet.

The Approach
The first thing the team did was look at the project requirements and think about our own requirements. Ultimately, the door should be able to recognize the pet trying to use the door, allow the owner to lock the door, allow the owner to look at what times the door was used, while maintain a normal door size and quiet noise levels. With these goals in mind, we first thought of using a Bluetooth system to allow the owner to wirelessly lock and unlock the door and have the pet use a device on its collar to recognize the door. After much thought and planning, we realized the Bluetooth on the pet collar wouldn’t work as intended and decided to swap to a RFID module. The RFID is more affordable and allows multiple devices to be recognized, meaning multiple pets would be able to access the door with no issue. Doing this also allows the owner to see which pet went through the door at what time. To help keep noise down for the door, we decided to keep the overall voltage low, meaning we wouldn’t have any noisy generators or devices. This does make it harder to distribute power and find devices that meets the power requirements, one device that we encountered this issue with was the solenoid. The solenoid would serve as a way for the door to lock. Lastly we were originally going to have a flap door but realized there wouldn’t be much security, ultimately changed to a rigid plank for the door. We were also required to design a PCB for the project and decided to make it simple to allow the smaller electronics to be connected nicely to the Arduino and RFID module. The team met weekly to update our findings and decisions on the project. We enjoyed meeting and discussing the possibilities for the project.

Lessons Learned
As for what we learned on the technical side. We learned how to use a RFID sensor and how to code it with an Arduino. We also learned how to design a PCB and what to consider when making a PCB. While we learned a lot of the technicalities into the project, the biggest lesson learned by the team was being able to communicate and figure out how our individual pieces to the project can be put together to make the full product. Projects done alone are easy in the sense of having a big picture in your control, however this does limit the project to being small. With a team for a project, we can make a bigger project but had to learn how to envision the big picture as a team. With this, we learned our communication skills and how to share individual thoughts on the project.