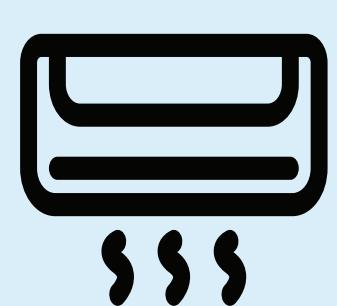


B.A.R.N

Book A Room Now!

Background

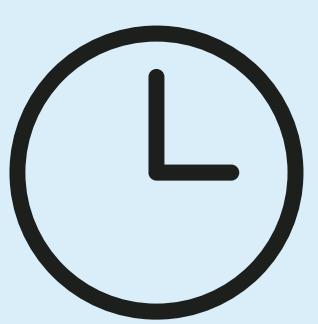


The air conditioning in our school is controlled by a timer, which is controlled based on the schedules of staff and students.

Staff and students are unable to tell if a room is occupied or not unless there is already a pre-booking, or if they go to the room themselves.



Problems



The current system is inflexible as students often use the classroom beyond school hours. Furthermore, staff are unable to change lesson timings because the air con will be off.

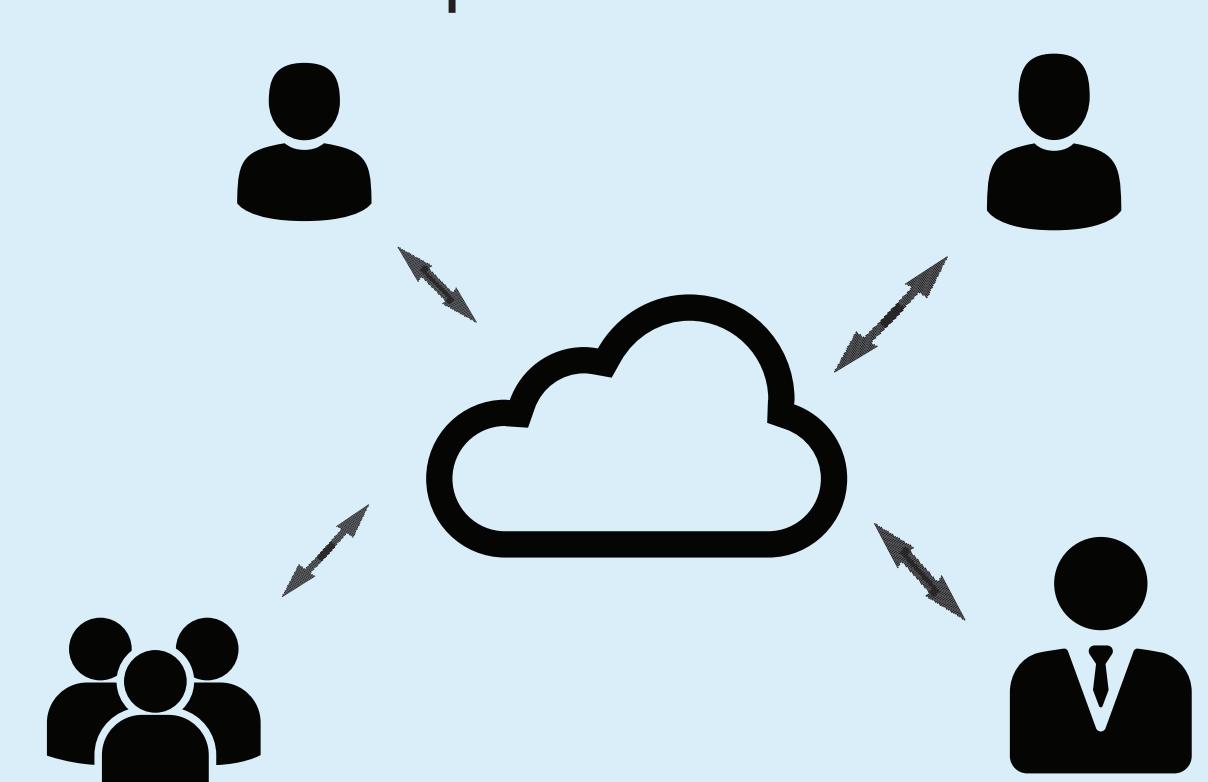
The air conditioning in certain locations such as the library, SAC, auditorium is often left on for longer than necessary, resulting in an inefficient use of electricity

Solution



By implementing a motion sensor along with Firebase to store data in the cloud, we intend to make an app for SUTD staff and students to allow them to check for the availability of rooms.

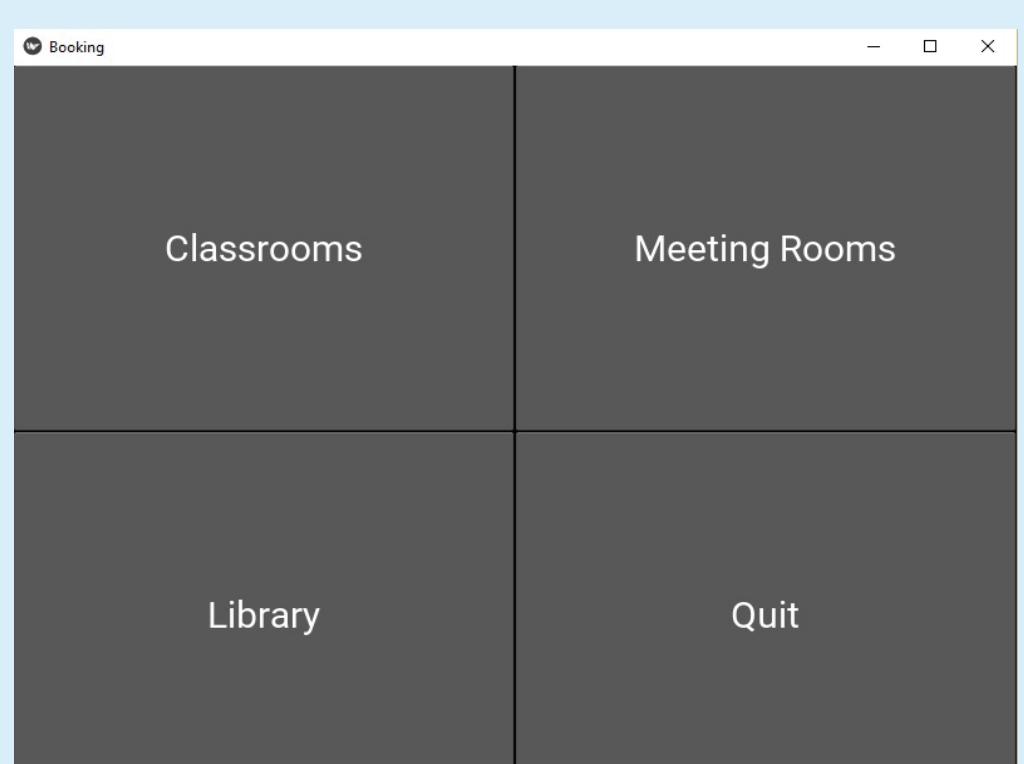
Also, we intend to tweak the air conditioning system to read data from Firebase, so that it will turn on and off according to the occupancy in the respective rooms.



Benefits of our system

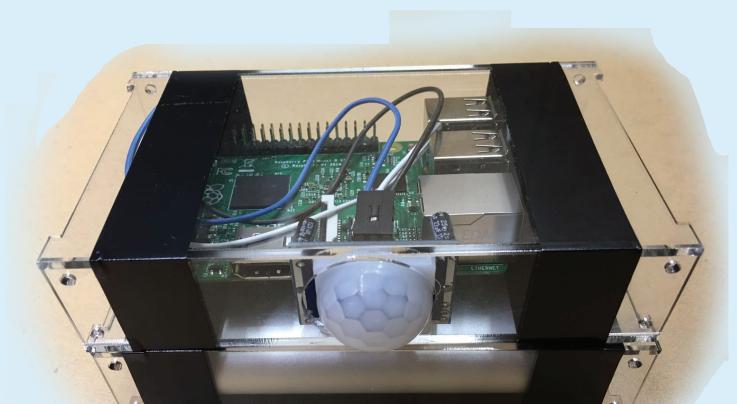
- ☛ Check availability on the go
- ⚡ Saves electricity by using only when needed
- 🕒 Automated system

Our app

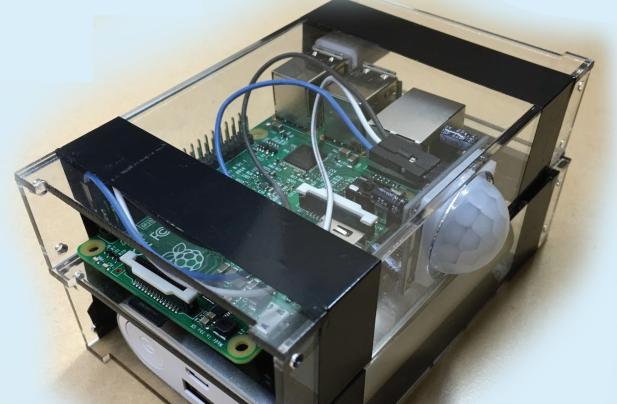


Our app aims to connect the user to the system, allowing them to view the availability of rooms, which is updated through Firebase as our cloud data storage.

Actual prototype

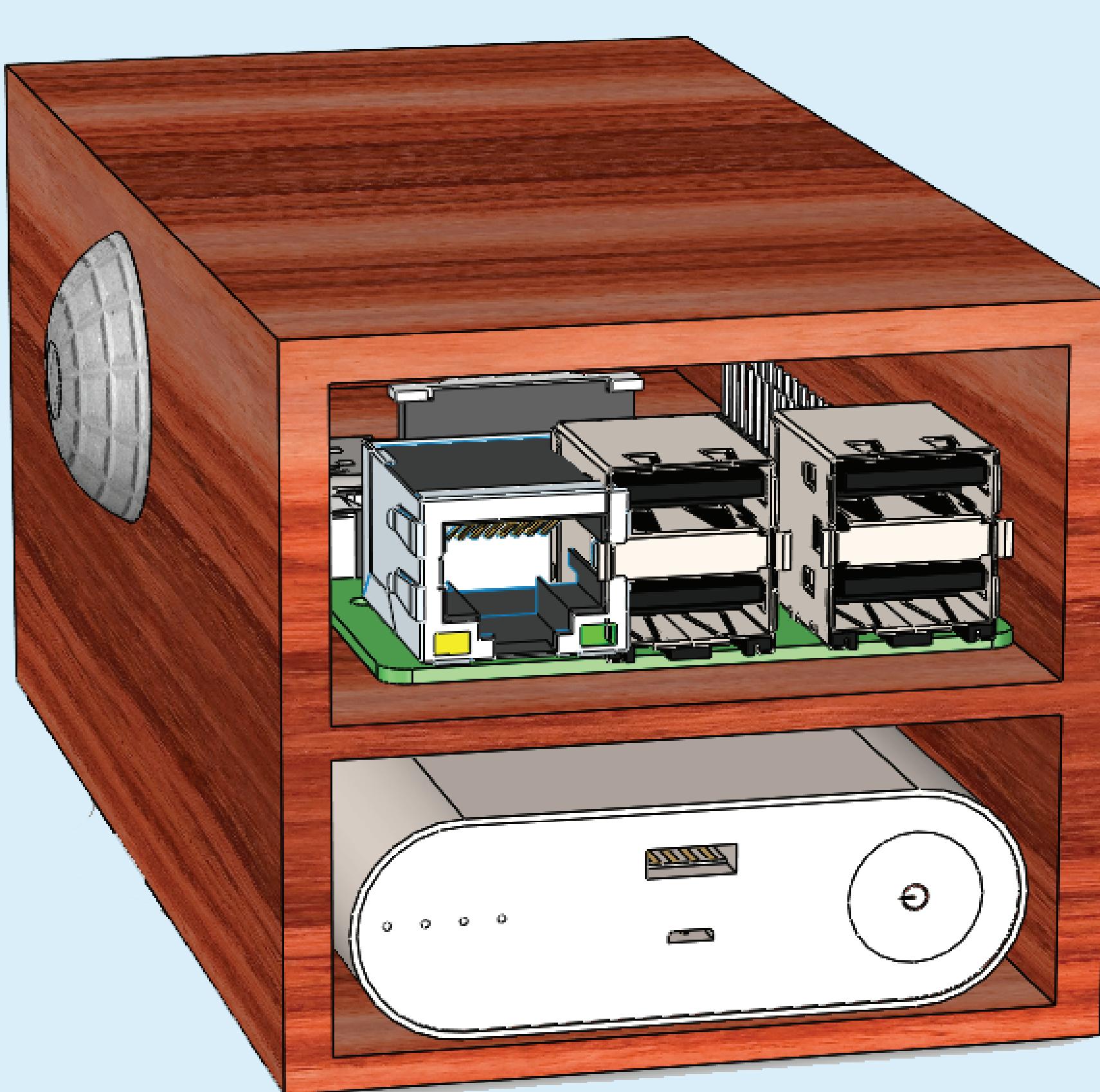


Front view



Side view

Our Product

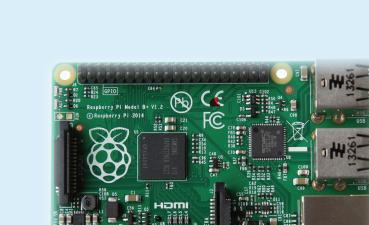


Components



PIR Motion sensor

Detects presence of people coming in and out of the room



Raspberry pi

Serves as the platform for our components



Webcam

Serves as a second layer of check to detect presence of people in the room



Power bank

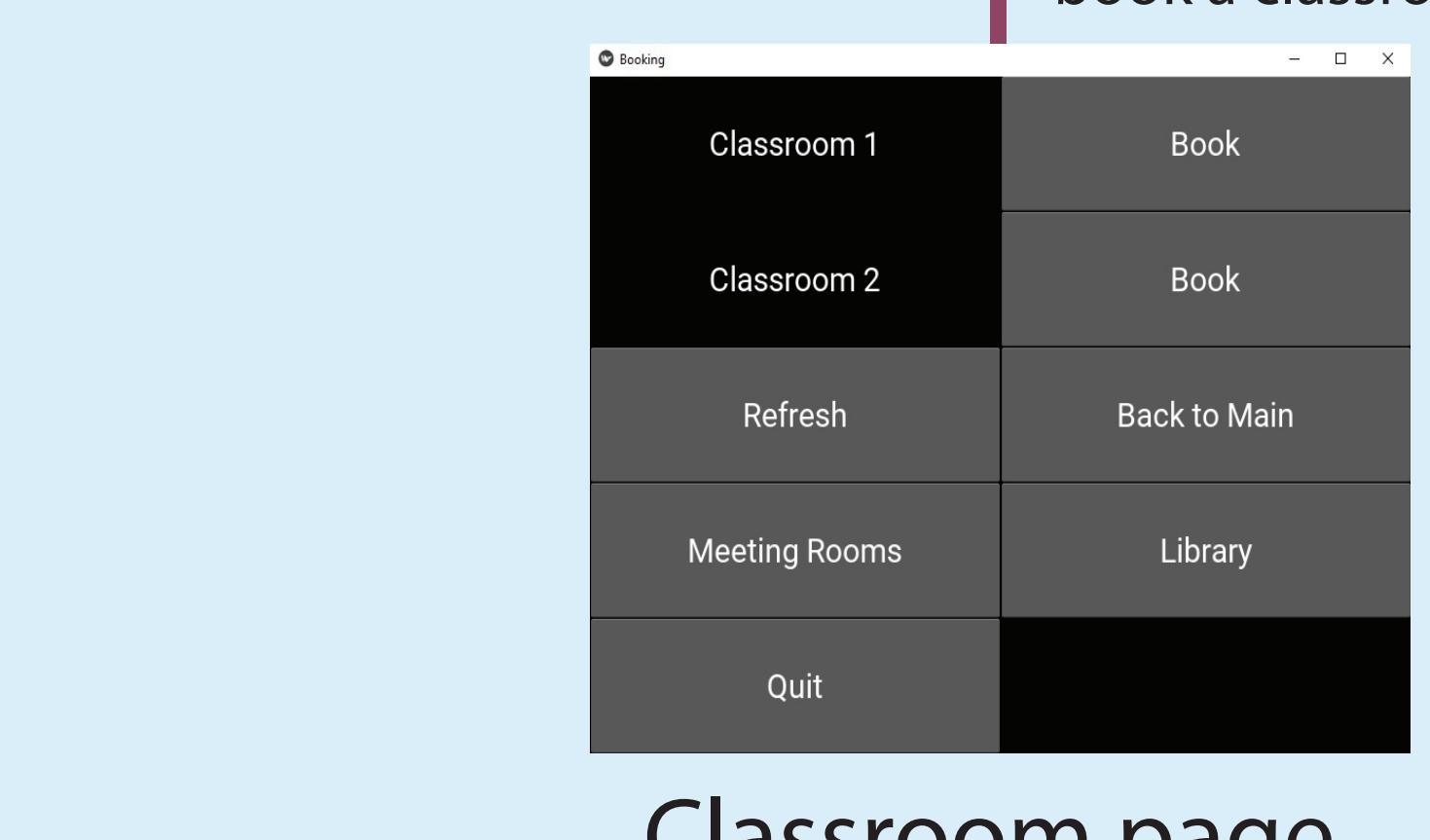
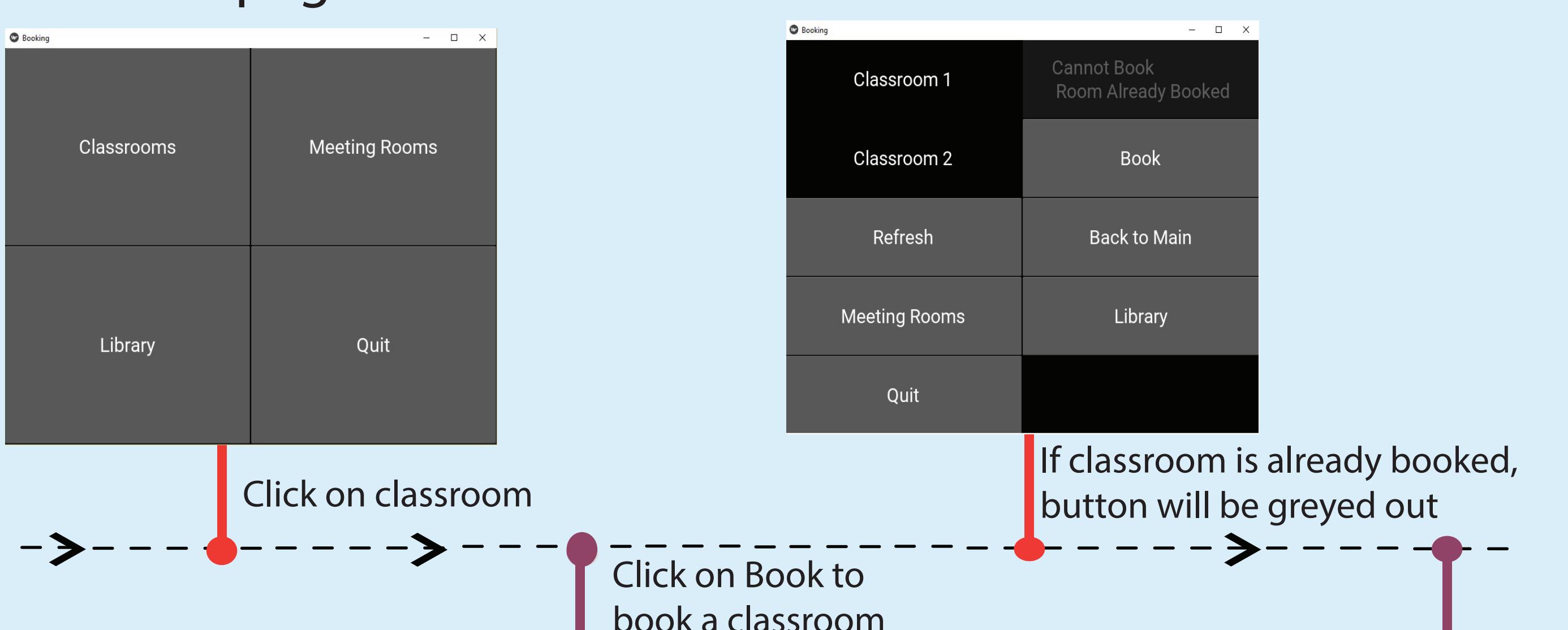
Acts as power source

Credits

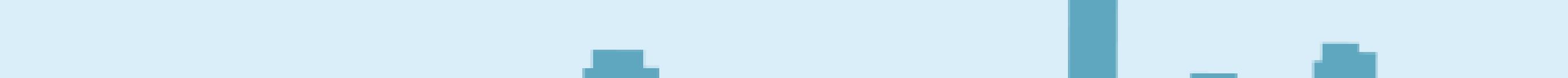
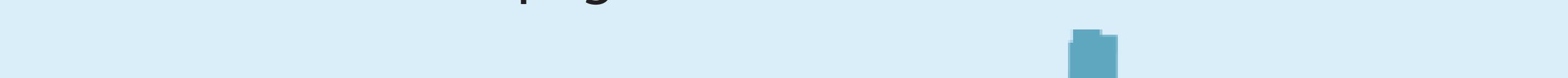
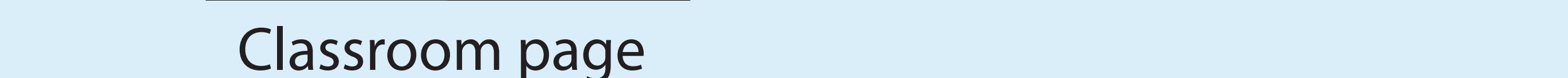
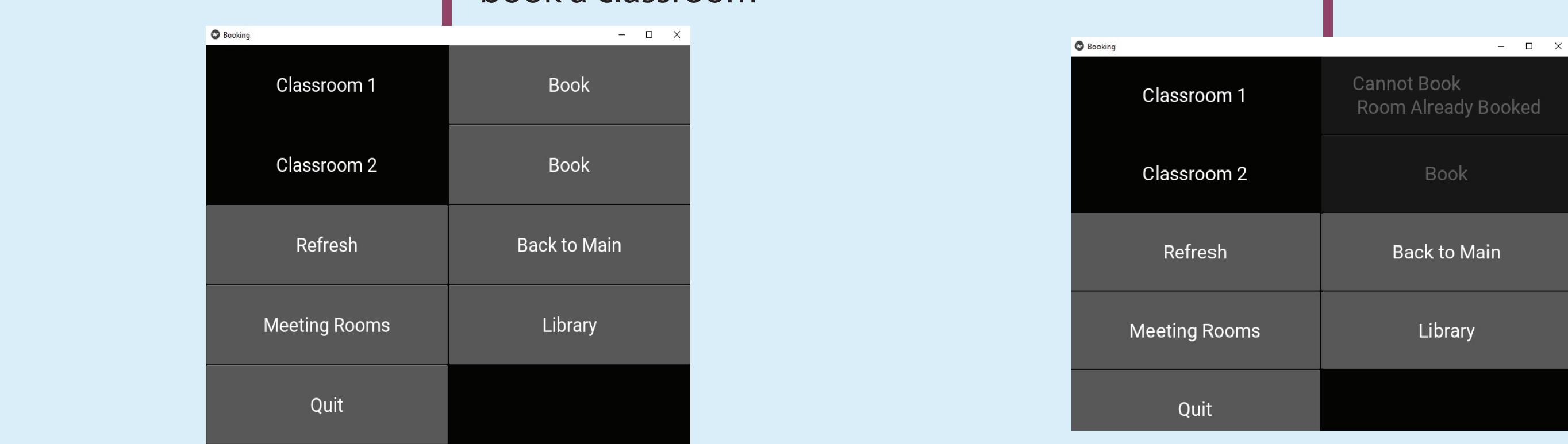
<https://pythonprogramming.net/haar-cascade-face-eye-detection-python-opencv-tutorial/> (Face recognition code)

Booking a classroom

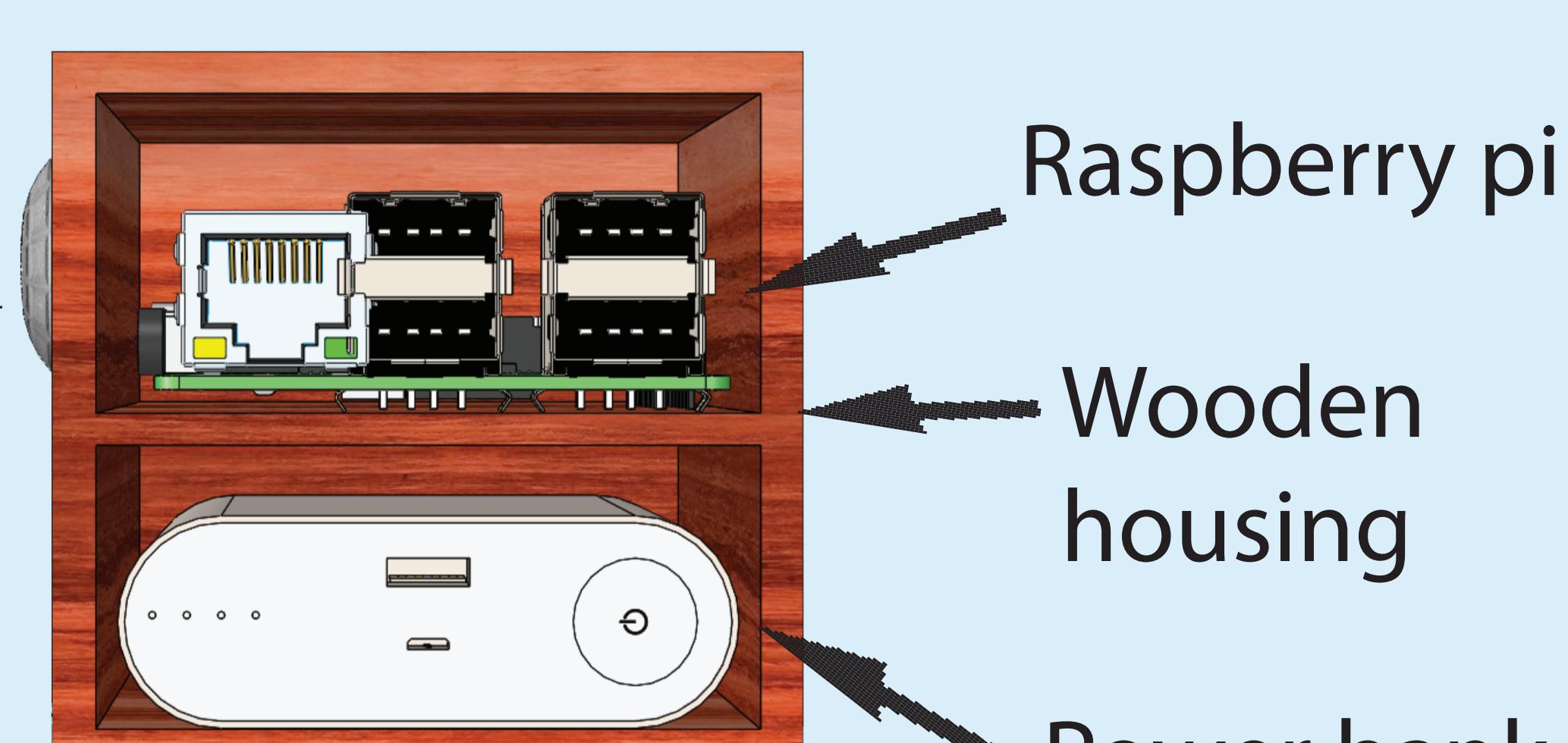
Main page



Classroom page



Schematics



Usage of Firebase

We make use of Firebase as our cloud services provider. By implementing Firebase into our Python code for our app, we can integrate the interaction of the user with the data in the cloud to provide a seamless experience in booking facilities

