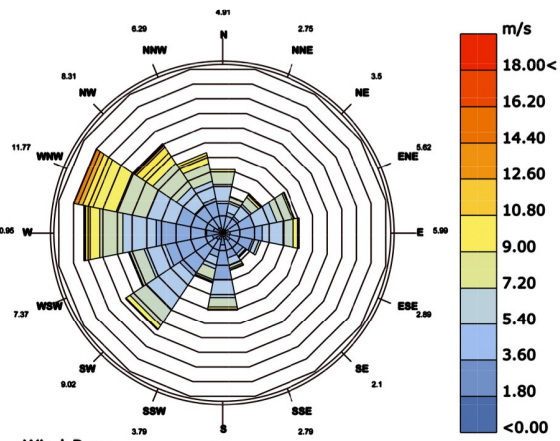


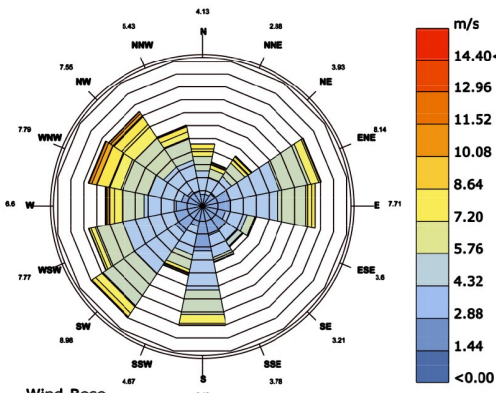


# Dream Room Strategy from Climate Data

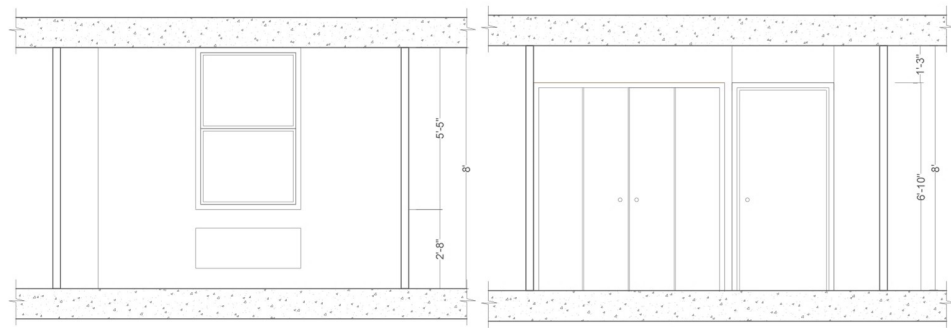
Philadelphia County\_Pennsylvania  
Longitude: -75.2311, Latitude: 39.8683



Wind-Rose  
Philadelphia International Ap\_PA\_USA  
1 SEP 1:00 - 31 MAR 24:00  
Hourly Data: Wind Speed (m/s)  
Calm for 3.34% of the time = 170 hours.  
Each closed polyline shows frequency of 1.2%. = 59 hours.



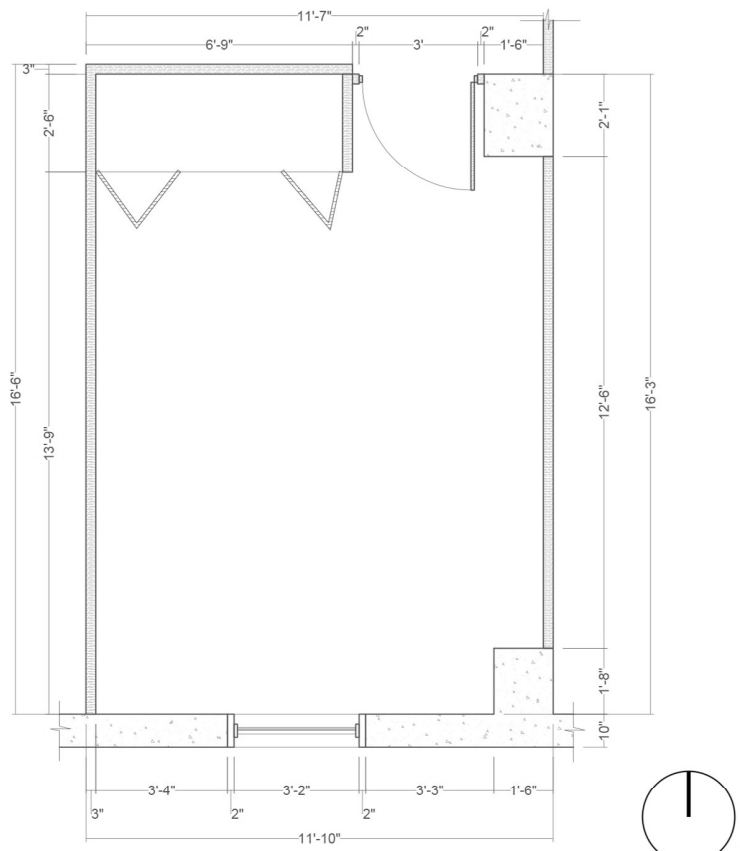
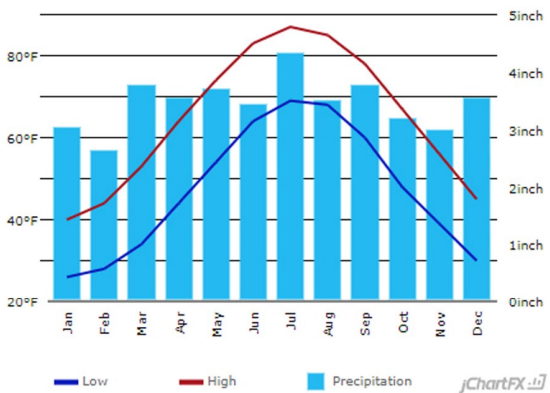
Wind-Rose  
Philadelphia International Ap\_PA\_USA  
1 MAR 1:00 - 30 SEP 24:00  
Hourly Data: Wind Speed (m/s)  
Calm for 2.65% of the time = 136 hours.  
Each closed polyline shows frequency of 0.9%. = 46 hours.

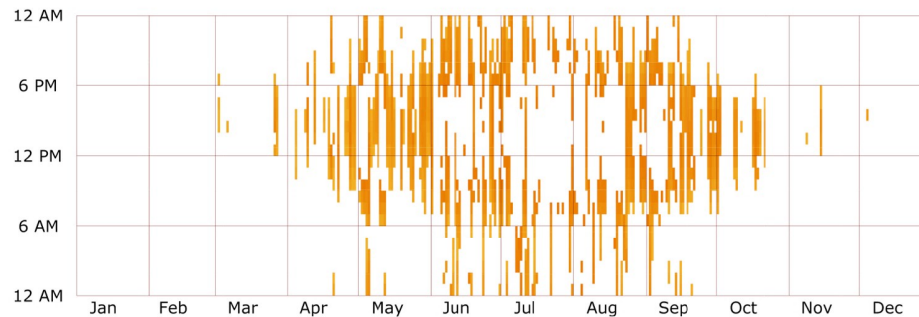
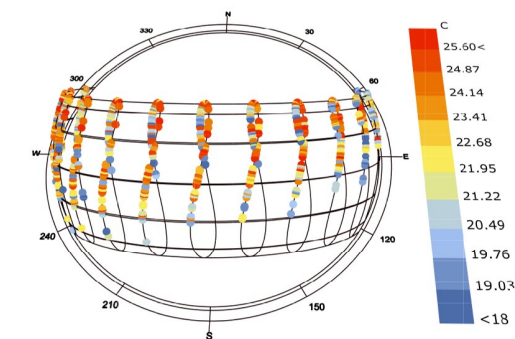


Strategy 1: From the wind rose chart it can be seen that in winter the WWWW, NW and W side has the highest velocity and frequency. Therefore this side can be closed for direct wind. But the summer has additional wind rose from WSW SW and S. Therefore, Making opening in these sides would let the summer breeze in.

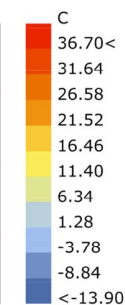
But since from percipitation data the summer rain rate is quite high so it should have some form of control.

Philadelphia Climate Graph - Pennsylvania Climate Chart

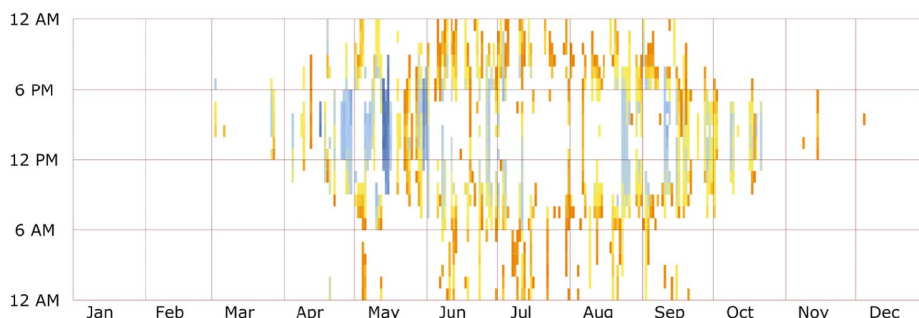
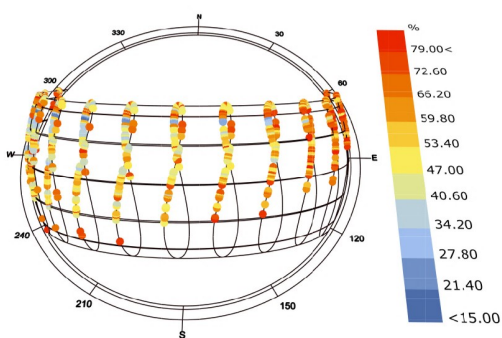




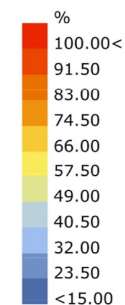
Dry Bulb Temperature (C) - Hourly  
Philadelphia International Ap\_PA\_USA  
1 JAN 1:00 - 31 DEC 24:00



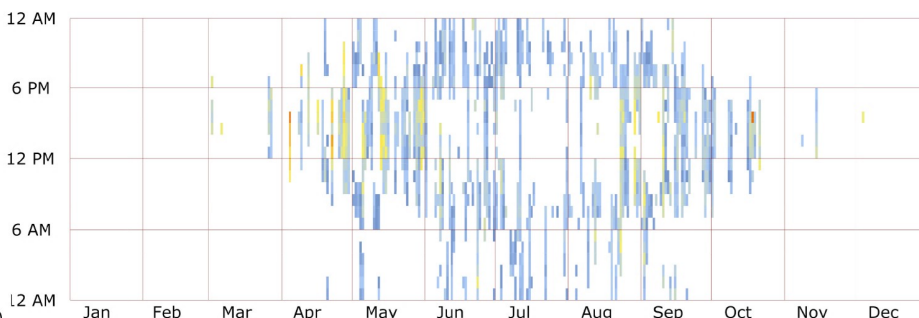
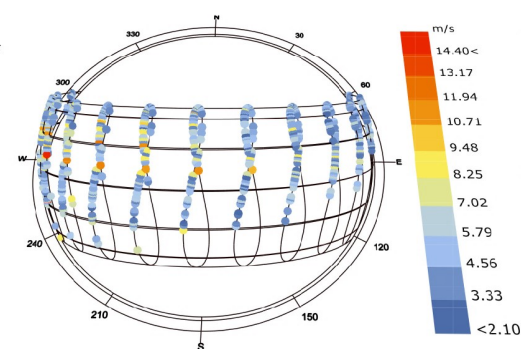
Strategy 2: Due to the sun path position, openings in the south would receive direct sunlight but it is the rooms only aperture to outside so the window must be in the south. Again, the pattern of the comfortable times and sun positions to cover shows that some form of offsetted horizontal shading device may cover most of the direct sunlight.



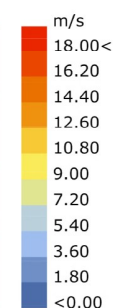
Relative Humidity (%) - Hourly  
Philadelphia International Ap\_PA\_USA  
1 JAN 1:00 - 31 DEC 24:00



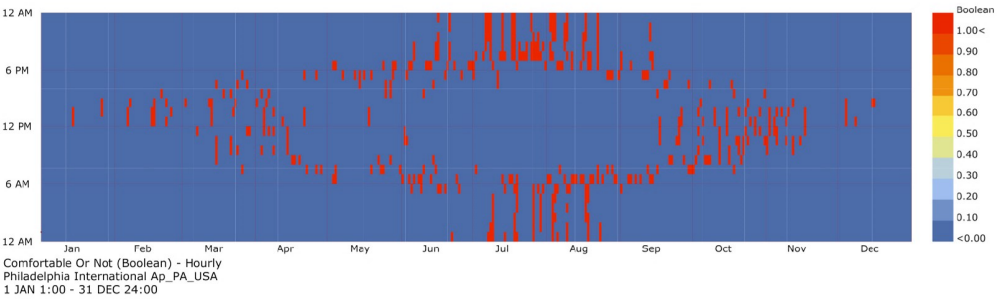
Strategy 3: The humidity is quite high during summer but adding proper wind change rate is making the place comfortable. Therefore, necessary wind passing system through opening would ensure comfort level most of the summer



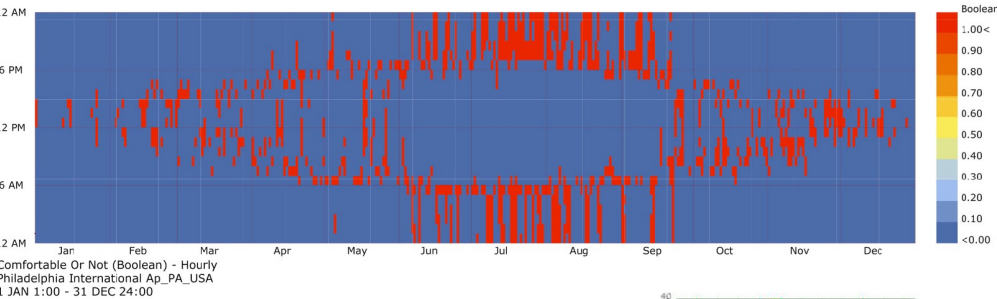
Wind Speed (m/s) - Hourly  
Philadelphia International Ap\_PA\_USA  
1 JAN 1:00 - 31 DEC 24:00



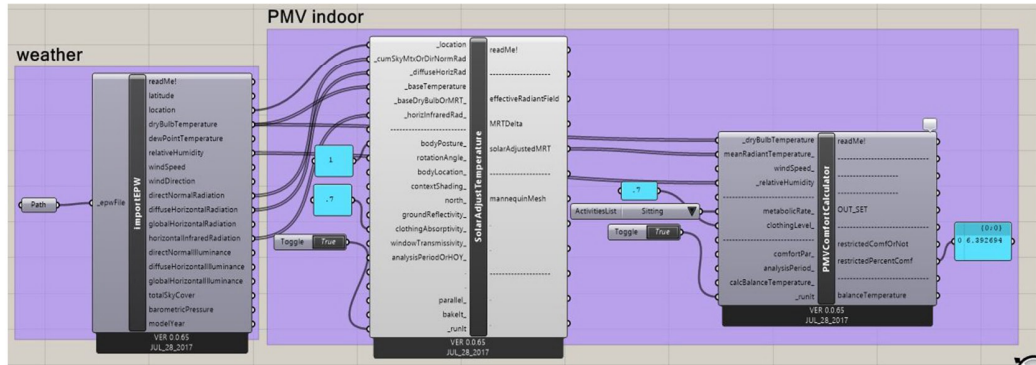
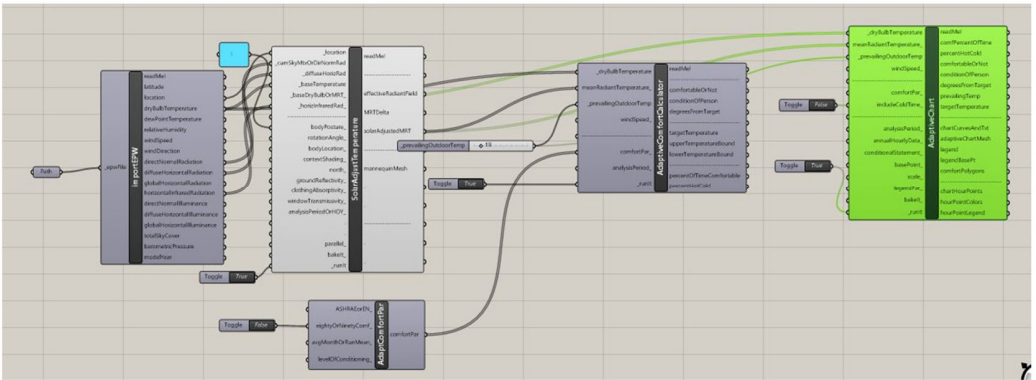
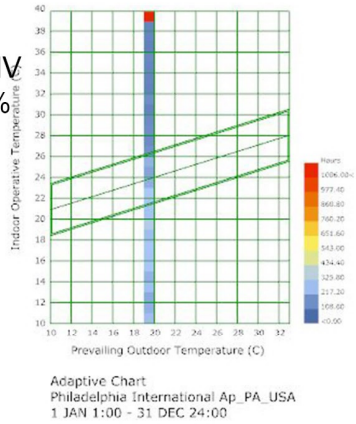
PMV Comfort Indoor



Adaptive Comfort Indoor



Percentage of comfortable time according to PMV method is 4.89% and Adaptive method is 11.89%. Therefore, some passive strategy should be applied to make it comfortable for more time



Outdoor Comfort

