THERMAL COMFORT ANALYSIS

161003-Week 3

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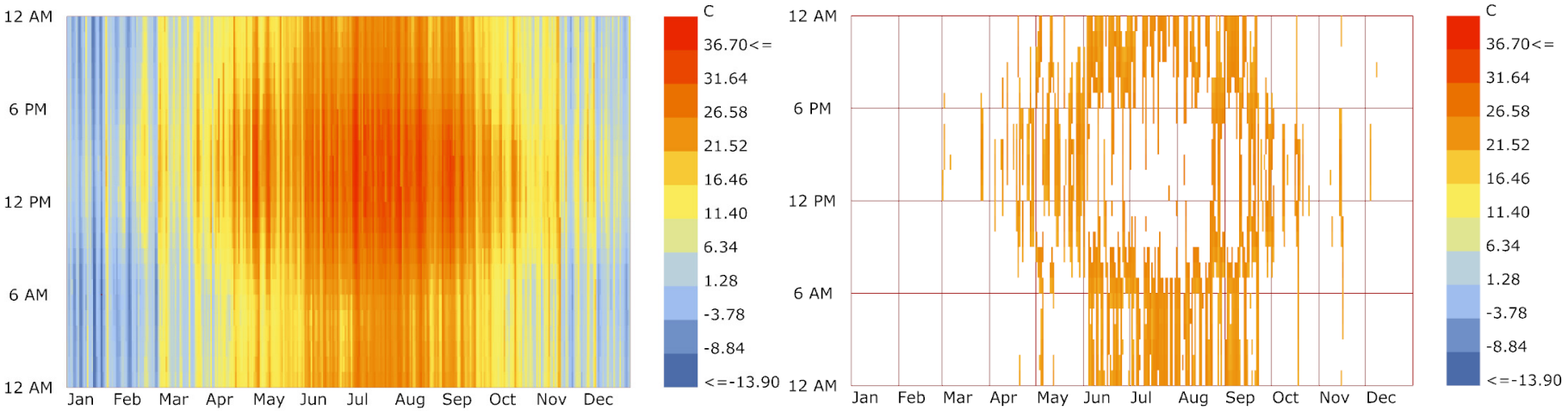
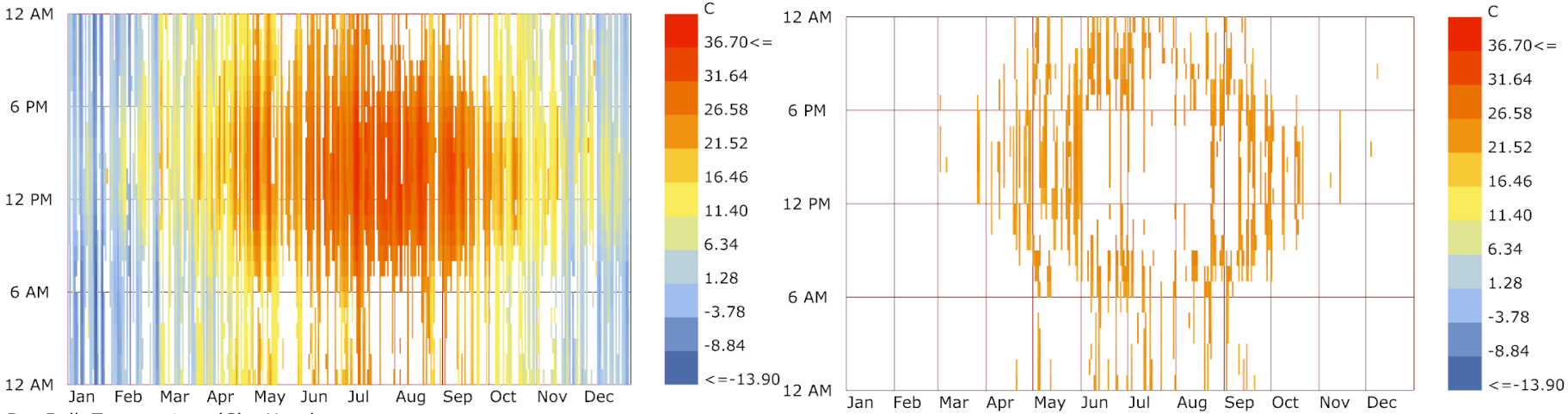
Arch 753 Building Performance Simulation
Instructor: Mostapha S. Roudsari
University of Pennsylvania
School of Design

TEMPERATURE ANALYSIS



Dry Bulb Temperature (C) - Hourly
Philadelphia International Ap_PA_USA
1 JAN 1:00 - 31 DEC 24:00



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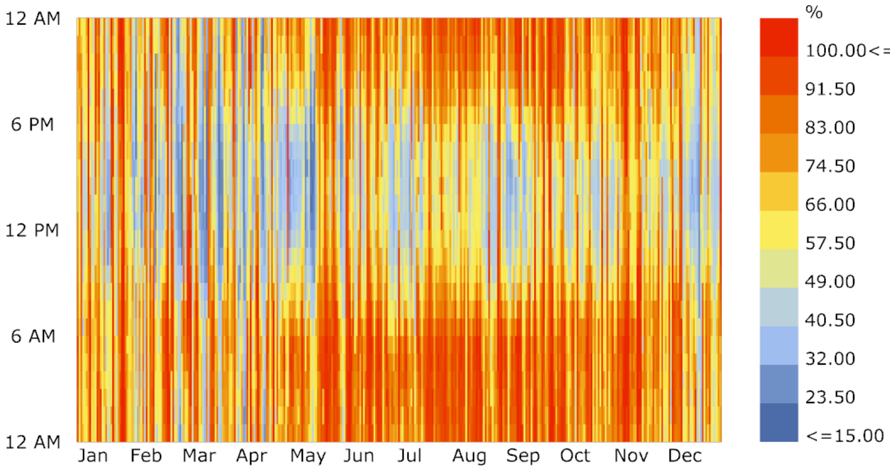
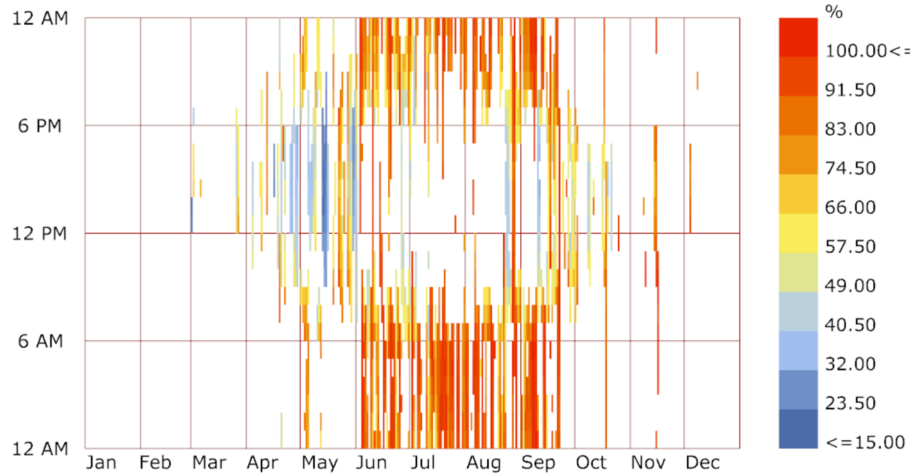
HUMIDITY ANALYSIS



Relative Humidity (%) - Hourly
Philadelphia International Ap_PA_USA
1 JAN 1:00 - 31 DEC 24:00



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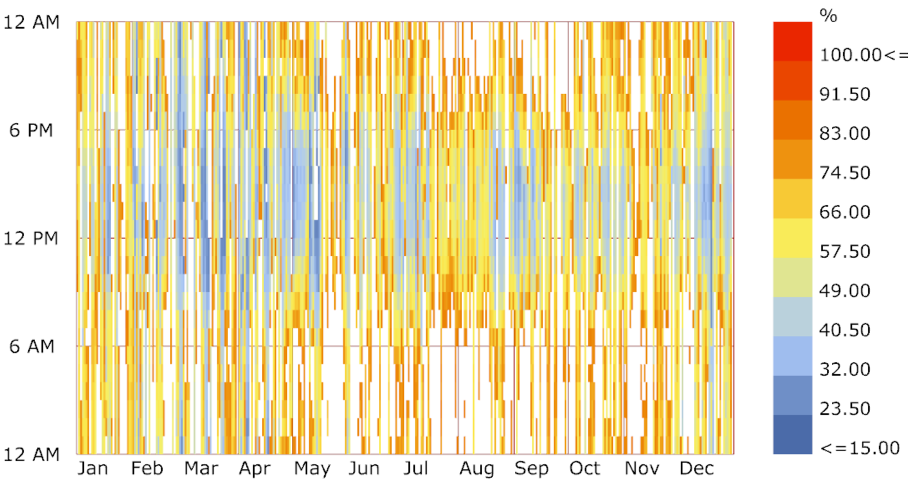

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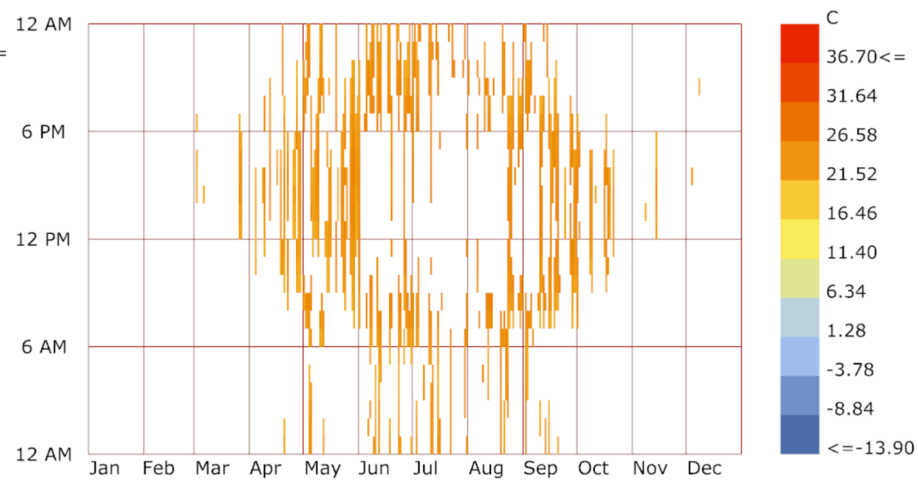

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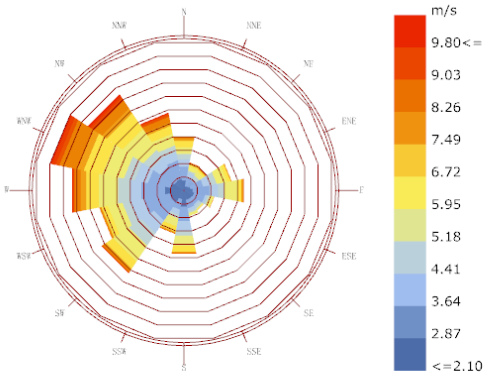
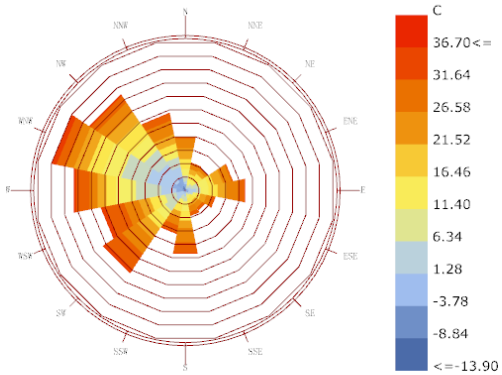
WIND-ROSE ANALYSIS



Wind-Rose
Philadelphia International Ap_PA_USA
1 JAN 1:00 - 31 DEC 24:00
Hourly Data: Wind Speed (m/s)
Calm for 0.00% of the time = 0 hours.
Each closed polyline shows frequency of 0.8%. = 69 hours.
... ...
Conditional Selection Applied:
20 < Relative Humidity < 80
and 2 < Wind Speed < 10
5288.0 hours of total 8760.0 hours (60.37%).



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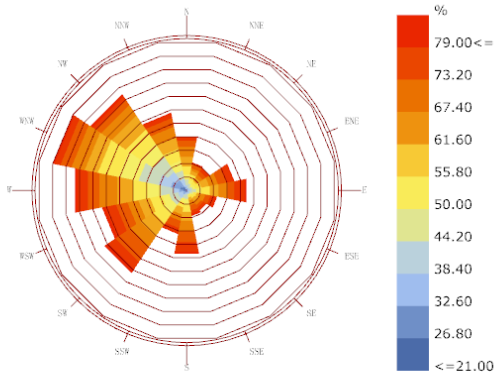

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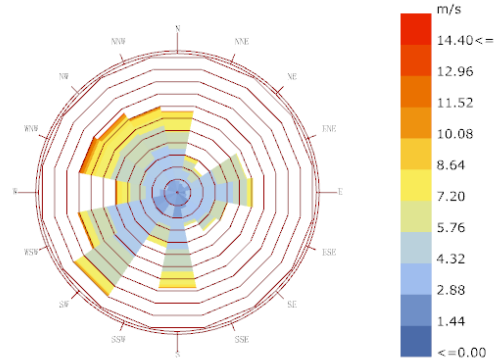

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Hourly Data: Wind Speed (m/s)
Calm for 0.15% of the time = 13 hours.
Each closed polyline shows frequency of 0.1%. = 10 hours.
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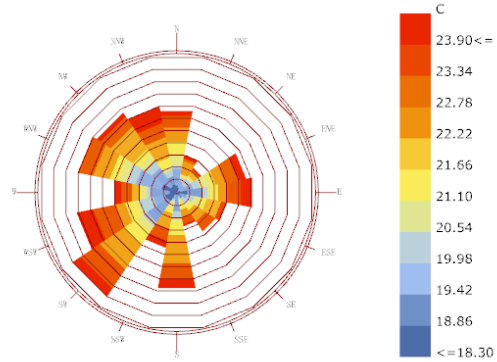
Conditional Selection Applied:
20 < Relative Humidity < 80
and 18 < Dry Bulb Temperature < 24
963.0 hours of total 8760.0 hours (10.99%).



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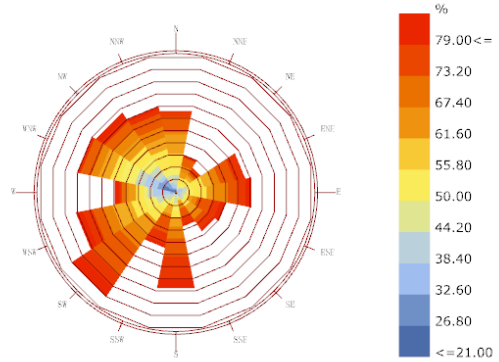

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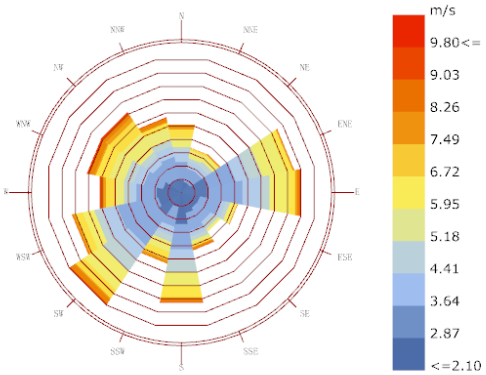
WIND-ROSE ANALYSIS



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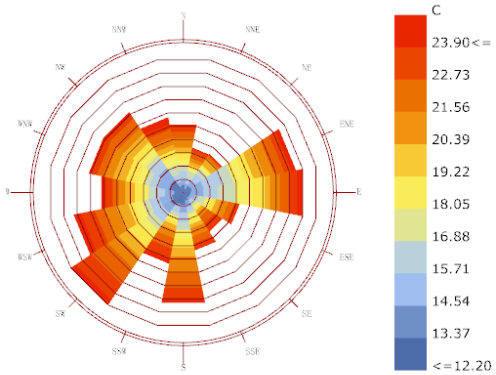
Calm for 0.00% of the time = 0 hours.
Each closed polyline shows frequency of 0.4%. = 30 hours.
... ...
Conditional Selection Applied:
12 < Dry Bulb Temperature < 24
and 2 < Wind Speed < 10
3084.0 hours of total 8760.0 hours (35.21%).



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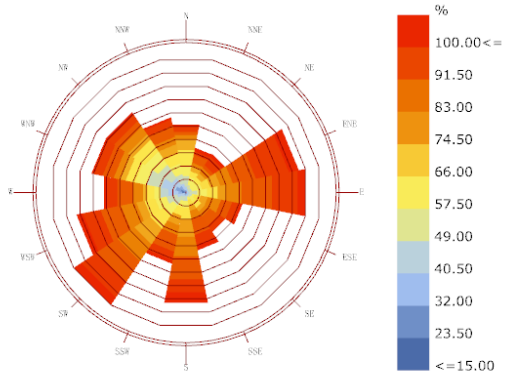

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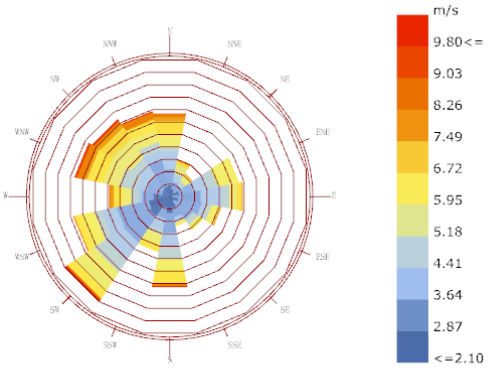

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Conditional Selection Applied:
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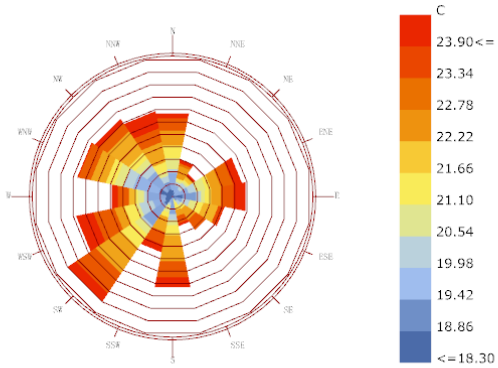
897.0 hours of total 8760.0 hours (10.24%).



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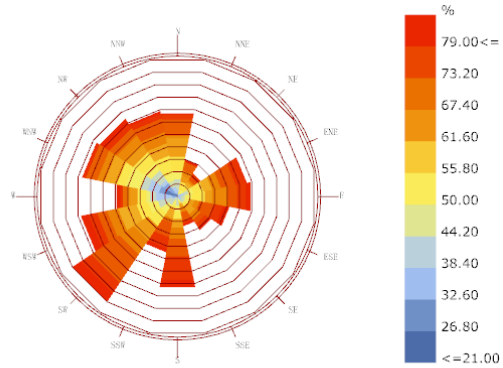

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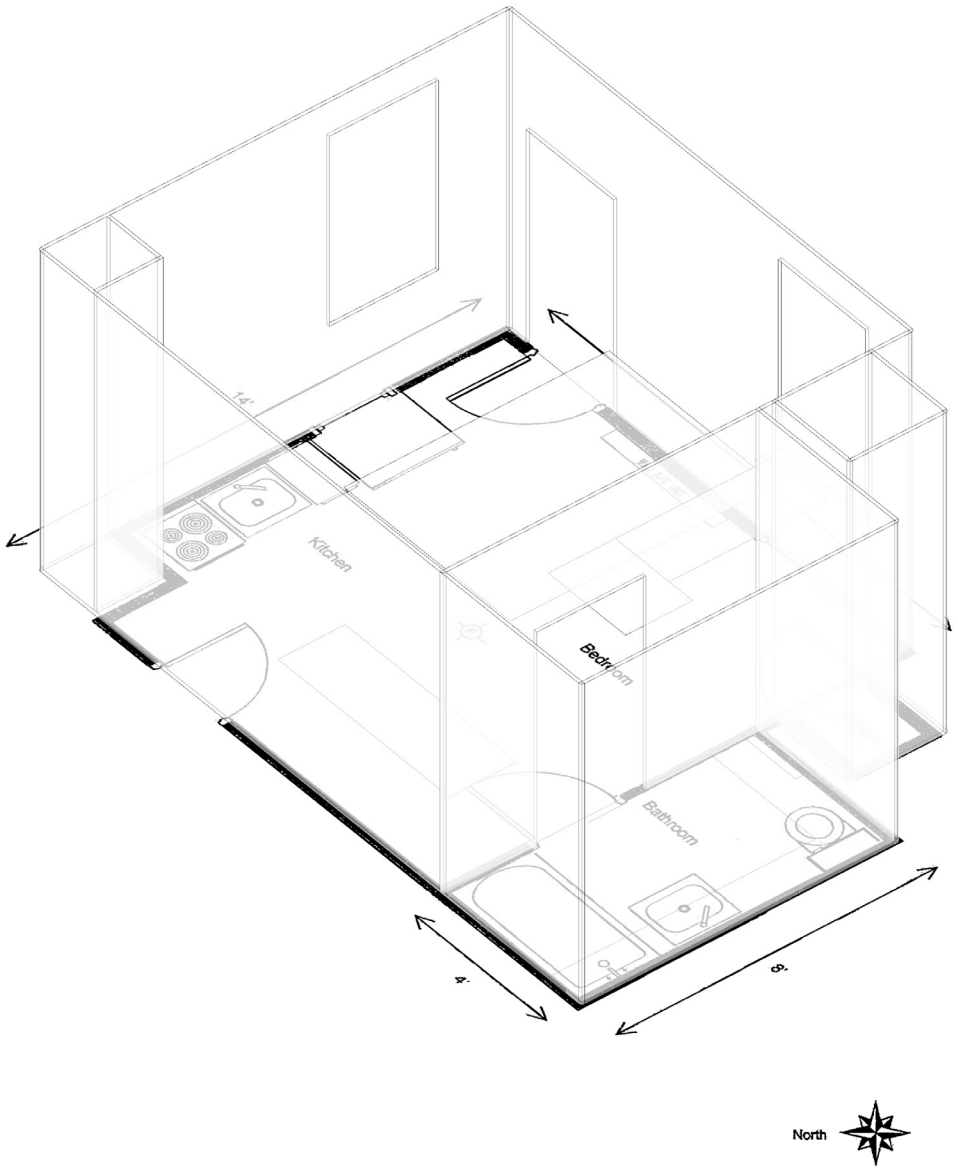
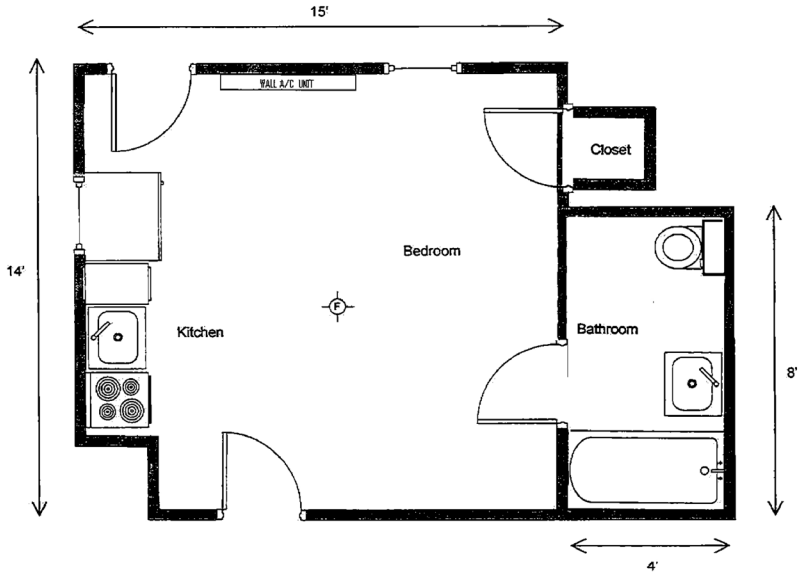
MY APARTMENT





THERMAL COMFORT FACTORS

Different Temperature Tendency

The temperature tendency is important to decide the thermal comfort. For some people they tend to live in a chill environment and others tend to live in a warm temperature. Also, it is sensitive for people to feel cold during the summer. I will feel cold when it's 23°C outside in summer but 16°C is warm for me in winter.

Different Clothes

When it's 23°C, if I wear a sweater and coat, I will feel it's very hot outside. However if I'm naked or wearing a t-shirt, I will feel chill.

Different Weather

If it's 23°C outside and sunny, I will feel warm because of the radiation. However if it is cloudy or I'm inside of my house without any radiation, I will feel cold. When it's windy or rainy I will still feel cold. Weather can impressively influence the sense of thermal comfort.

Different Activities

For the same 28°C, I will feel a little bit hot when I am sleeping but definitely cool when I just finished a basketball game.

Different Humidity

If it's 28°C outside and dry, I will feel cool. However if it is rainy, I will feel very uncomfortable because of the moisture.