



# Global & Local Temperatures

Patterns in Historical Data

## Pre-Questions

1. What is temperature? How does it relate to weather and climate?
2. Average temperature is the combination of the high and low temperatures on a given day for this data set. What conditions might cause average temperature to increase or decrease?

## PART 1: Local Temperature Changes & Climate

3. How many years of temperature data are present? What does each peak and each low point show?
4. If the 1<sup>st</sup> year is 1975, in which year did Orlando experience its *lowest average temperature*? In which was its *highest average temperature*?
5. In what way does the graph show weather? How does it show climate?

## PART 2: Global Temperature Changes & Climate

6. The graph shows the percentage change in temperature from one year to the next. What does the trend imply about the way temperature has been changing from year to year? What does this imply about climate?
7. A trend is a general shift in something that is consistent over the long term but can have fluctuations within itself. Is the trend for average land temperature and land and ocean temperature the same? Explain.
8. Why might the Land and Ocean temperature shifts generally trend under the land temperature alone? What property of water is involved?

## PART 3: Unstructured Coding

9. The data from part one includes precipitation, rewrite the code to see if precipitation show a pattern like temperature highs and lows each year?
10. Were there any years that were exceptionally dry? Is there any correlation with temperature?
11. The data from part one can be coded to display much wider which will make it easier to read and interpret. Make the width of the graph 400
12. Is it possible to change the color of your graphs? How? What colors?

## CODING INSTRUCTIONS

### PART 1: Local Temperature Changes & Climate

Changing the highlighted sections of your code will alter the resulting graph. Use the coding block to answer questions 3-5.

```
ax = data3.plot('date', 'avg', title="Average Temperature",
ax.set(xlabel="Date", ylabel="Average Temperature")

# Get current size
fig_size = plt.rcParams["figure.figsize"]

# Prints: [8.0, 6.0]
print( "Current size:", fig_size)

# Set figure width to 20 and height to 6.5
fig_size[0] = 20
fig_size[1] = 6.5
plt.rcParams["figure.figsize"] = fig_size

plt.show()
```

### PART 2: Global Temperature Changes & Climate

Run each of the code blocks to produce the graphs. The third graph will have no labels. Use what you learned in earlier code to add code to the highlighted section to put labels on your final graph. Use the final double line graph to answer questions 6-8.

```
# Wow, this needs a title and axis labels!
fig = plt.figure(figsize=(10, 5))
plt.plot(x1, y1, label="Land and Ocean")
plt.plot(x2, y2, label="Land only")

plt.legend()
plt.show()
```