

Lesson 2 - Variables

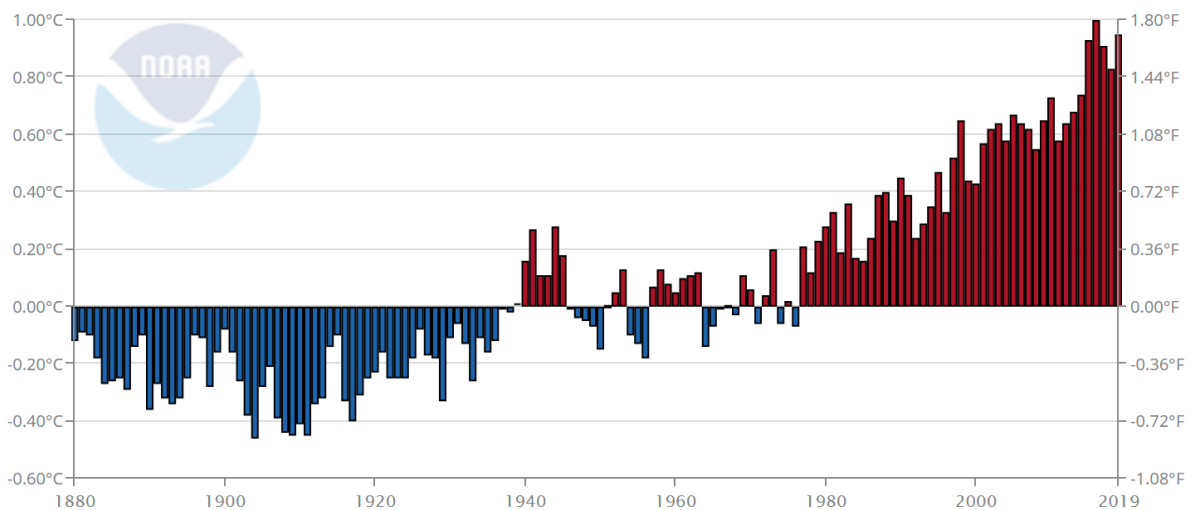
Storing data and values

Climate Change & Global Temperatures

Although the Earth is composed of both land and oceans, oceans make up 71% of the surface of the Earth. Their tremendous heat capacity means that it takes a large amount of heat energy to change the Earth's average surface temperature, even the slightest bit. This slight increase in temperature, an approximate 2 degree increase since the pre-industrial era, indicates significant warming of the Earth's atmosphere due to human activity. However, the pace at which the Earth is warming is of greater concern. Data reveals that temperatures increased by 0.07°C / 0.13°F per decade since 1880, a rate that has now doubled to 0.18°C / 0.32°F per decade since 1981.

Global Land and Ocean

January–December Temperature Anomalies



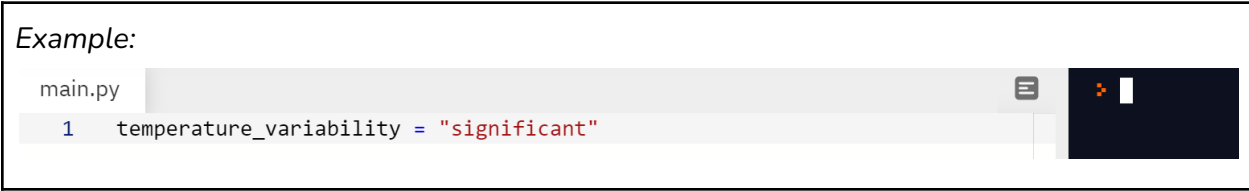
Source:

NOAA National Centers for Environmental information, Climate at a Glance: Global Time Series, published November 2020, retrieved on December 2, 2020 from <https://www.ncdc.noaa.gov/cag/>

Part 1: Create a variable and a string

1. Name the variable `temperature_variability` (underscore is used to separate words instead of spaces)
2. Use quotation marks `""` (single or double) to declare the **string** (collection of letters and characters)
3. Type `temperature_variability = "significant"` to declare the variable is equal to the value "significant".

Example:



```
main.py
1 temperature_variability = "significant"
```

✓ Task 1: Print the variable and string

Part 2: Create a variable with integers and floats

1. Name the variable `average_increase` and input the **integer** (a number without a decimal point) `2`.

```
average_increase = 2
```

2. Create another variable with the name `increase_before_1981` and input the **float** (a number with a decimal point) `0.07` and `increase_after_1981` and input the float `0.18`.

```
increase_before_1981 = 0.07
```

```
increase_after_1981 = 0.18
```

3. When variables are created, information is stored and can be referenced or used in a computer program. Use the variables you just created by asking the computer to print them for you. This can be done by using the **print()** function. For example:

```
print(average_increase)
```

This is a good opportunity to ask yourself how `print(average_increase)` is different from `print("average_increase")`. If you are not sure of the answer, input both examples into the simulator and see what happens!

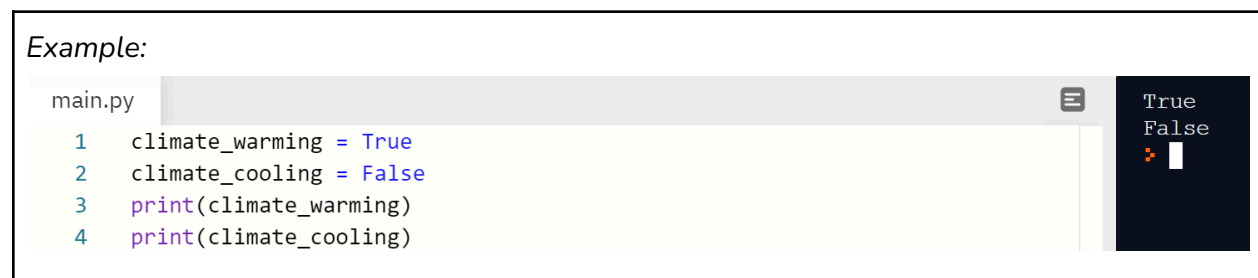
✓ **Task 2:** *Print the integer and the floats introduced in this lesson. Is it possible to add the two variables `increase_before_1981` and `increase_after_1981`? See if you can figure it out on your own. If you are unable to figure it out, check the answer key.*

Part 3: Create a boolean expression

A **boolean** is a value that is true or false.

1. Name the variable `climate_warming` and input the value `true`
2. Name the variable `climate_cooling` and input the value `false`
3. Print the boolean expressions.

Example:



```
main.py
1 climate_warming = True
2 climate_cooling = False
3 print(climate_warming)
4 print(climate_cooling)
```

True
False

Part 4: Classify variables

The **type** function allows you to identify the type of data. It is quite useful in the debugging process (detecting and removing errors).

1. Identify the type of data for the variable `temperature_variability = "significant"` by combining the `print` and `type` functions.
2. Add an extra set of parentheses (`()`):

```
print(type(temperature_variability))
```

Example:



```
main.py
1 temperature_variability = "significant"
2 print(type(temperature_variability))
```

<class 'str'>

✓ **Task 3:** *Identify the data type for all the variables explored in lesson 2: `temperature variability`, `average increase`, `increase before 1981`, `increase after 1981`, `climate warming` and `climate cooling`.*