

# cedargrove\_airqualitytools

A collection of CircuitPython helpers used for the calculation of air quality levels.

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## Implementation Notes

Hardware:

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://github.com/adafruit/circuitpython/releases>

## cedargrove\_airqualitytools.co2\_iaq

### CO2 Concentration Indoor Air Quality

`co2_ppm_to_quality(co2_ppm)`

Calculate the Indoor Air Quality Index (IAQ) as derived from CO2 ppm concentration. Returns a data valid flag, CO2 input concentration value, the RGB warning color integer value, and the corresponding US English description or warning. Input concentration value range is 0 to 6000 ppm. No default.

**Parameters:**

- **co2\_ppm** – The CO2 concentration value in ppm. Range is 0 to 6000 ppm. No default value.

Example:

```
>>> from cedargrove_airqualitytools.co2_iaq import co2_ppm_to_quality
>>> co2_ppm_to_quality(1450)      # Indoor Air Quality calculator
(True, 1450, 16776960, 'POOR')
```

## cedargrove\_airqualitytools.pm25\_aqi

### PM2.5 Particulate Air Quality Index

`pm25_ppm_to_quality(pm25_ppm)`

Calculate the Air Quality Index (AQI) as derived from PM2.5 particulate concentration. Returns a data valid flag, calculated AQI, the RGB warning color integer value, and the corresponding US English description or warning. Input concentration value range is 0 to 500 ppm. No default.

NOTE: The calculated AQI returned by this function should ideally be measured using the 24-hour PM2.5 concentration average. Calculating a AQI without averaging will result in higher AQI values than expected.

**Parameters:**

- **pm25\_ppm** – The CO2 concentration value in ppm. Range is 0 to 6000 ppm. No default value.

Example:

```
>>> from cedargrove_airqualitytools.pm25_aqi import pm25_ppm_to_quality
>>> pm25_ppm_to_quality(150)      # AQI calculator
(True, 200, 16711680, 'UNHEALTHY')
```

## Air Quality Observation and Warning Translator

```
english_to_deutsch.interpret(enable=True, english_phrase="")
```

Translate an English phrase to Deutsch (German).

- Parameters:**
- **enable** – Enable the translator. Defaults to **True**.
  - **english\_phrase** — English phrase to be interpreted. Defaults to blank.

```
english_to_francais.interpret(enable=True, english_phrase="")
```

Translate an English phrase to Français (French).

- Parameters:**
- **enable** – Enable the translator. Defaults to **True**.
  - **english\_phrase** — English phrase to be interpreted. Defaults to blank.

```
english_to_pirate.interpret(enable=True, english_phrase="")
```

Translate an English phrase to Pirate.

- Parameters:**
- **enable** – Enable the translator. Defaults to **True**.
  - **english\_phrase** — English phrase to be interpreted. Defaults to blank.

### Example:

```
>>> from cedargrove_airqualitytools.translate.english_to_deutsch import interpret
>>> interpret(True, "UNHEALTHY") # Translate to Deutsch (German)
'UNGESUND'
>>> interpret(False, "UNHEALTHY") # Turn off translator; revert to English
'UNHEALTHY'
```