color_index_to_rgb

A collection of CircuitPython methods for converting a normalized spectral index to RGB color values. Included in the collection are spectral conversion methods for visible light, grayscale, and iron temperature color.

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Implementation Notes

Hardware:

Software and Dependencies:

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

helper_class grayscale_spectrum(*index=0.0, gamma=0.8*)

Translates the normalized index value into a 24-bit RGB integer with gamma adjustment. The spectral index is a floating point value in the range of 0.0 to 1.0 (inclusive); default is 0.0. The gamma value can be from 0.0 to 1.0 (inclusive); default is 0.8, tuned for TFT displays. If the index or gamma value is outside of the specified range, the 24-bit RGB output will be limited to the minimum (0x0) or maximum (0xFFFFFF) value.

Parameters:

- **index** – The normalized spectral input value. Can be a positive floating point value in the range of 0.0 to 1.0. Default value of 0.0.
- **gamma** — The normalized gamma input value. Can be a positive floating point value in the range of 0.0 to 1.0. Default value of 0.8 for TFT displays.

Example:

```
>>> from cedargrove_unit_converter.index_to_rgb.grayscale_spectrum import index_to_rgb
>>> hex(index_to_rgb(0.5, 1.0))
'0x8c8c8c'
```

helper_class iron_spectrum(*index=0.0, gamma=0.5*)

Translates the normalized index value into a 24-bit RGB integer with gamma adjustment. The spectral index is a floating point value in the range of 0.0 to 1.0 (inclusive); default is 0.0. The gamma value can be from 0.0 to 1.0 (inclusive); default is 0.5, tuned for TFT displays. If the index or gamma value is outside of the specified range, the 24-bit RGB output will be limited to the minimum (0x0) or maximum (0xFFFFFF) value.

Parameters:

- **index** – The normalized spectral input value. Can be a positive floating point value in the range of 0.0 to 1.0. Default value of 0.0.
- **gamma** — The normalized gamma input value. Can be a positive floating point value in the range of 0.0 to 1.0. Default value of 0.5 for TFT displays.

Example:

```
>>> from cedargrove_unit_converter.index_to_rgb.iron_spectrum import index_to_rgb
>>> hex(index_to_rgb(0.5, 1.0))
'0xff0000'
```

helper_class visible_spectrum(*index=0.0, gamma=0.5*)

Translates the normalized index value into a 24-bit RGB integer with gamma adjustment. The spectral index is a floating point value in the range of 0.0 to 1.0 (inclusive); default is 0.0. The gamma value can be from 0.0 to 1.0 (inclusive); default is 0.5, tuned for TFT displays. If the index or gamma value is outside of the specified range, the 24-bit RGB output will be limited to the minimum (0x0) or maximum (0xFFFFFF) value.

Parameters:

- **index** – The normalized spectral input value. Can be a positive floating point value in the range of 0.0 to 1.0. Default value of 0.0.
- **gamma** — The normalized gamma input value. Can be a positive floating point value in the range of 0.0 to 1.0. Default value of 0.5 for TFT displays.

Example:

```
>>> from cedargrove_unit_converter.index_to_rgb.visible_spectrum import index_to_rgb
>>> hex(index_to_rgb(0.5, 1.0))
'0x6dff00'
```