si-prefix Documentation

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CHAPTER 1

si_prefix

Functions for formatting numbers according to SI standards.

Example usage:

```
from si_prefix import si_format

print si_format(.5)
# 500.0 m  (default precision is 1)

print si_format(.01331, precision=2)
# 13.31 m

print si_format(1331, precision=2)
# 1.33 k

print si_format(1331, precision=0)
# 1 k
```

CHAPTER 2

Changelog

- **1.0:** use unicode strings and use µ (i.e., `\N{MICRO SIGN}`) to denote micro (not u).
  - **Note: switching to unicode strings is an API-breaking change and may break code expecting a ‘‘str‘‘ return type.**
  - See issue #4 for more details.
- **0.5:** change license to 3-clause BSD
- **0.4.1:** add space before unit prefix
- **0.4:** add Python 3 support, `si_parse` function
- **0.2:** bug fixes
- **0.1:** initial release

CHAPTER 3

Credits

Written by Christian Fobel christian@fobel.net

Ported from C version written by Jukka "Yucca" Korpela
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3.1 Contributors

Python 3 support: olehermanse

3.2 License

This project is licensed under the terms of the BSD 3-clause license

3.3 API

`si_prefix.`**`CRE_SI_NUMBER = <_sre.SRE_Pattern object at 0x2e00e50>`**

Changed in version 1.0: Use unicode string for SI unit to support micro (i.e., µ) character.

See also:

Issue #4.

`si_prefix.`**`SI_PREFIX_UNITS = u'yzafpn\xb5m kMGTPEZY'`**

Changed in version 1.0: Define as unicode string and use µ (i.e., `\N{MICRO SIGN}`, `\x0b5`) to denote micro (not u).

See also:

Issue #4.

Forum post discussing unicode using µ as an example.

The International System of Units (SI) report from the Bureau International des Poids et Mesures

`si_prefix.prefix(expof10)`

Parameters **expof10** – Exponent of a power of 10 associated with a SI unit character.

Returns One of the characters in "yzafpnum kMGTPEZY".

Return type str

`si_prefix.si_format(value, precision=1, format_str=u'{value} {prefix}', exp_format_str=u'{value}e{expof10}')`

Format value to string with SI prefix, using the specified precision.

Parameters

- **value** (*int, float*) – Input value.
- **precision** (*int*) – Number of digits after decimal place to include.
- **format_str** (*str or unicode*) – Format string where `{prefix}` and `{value}` represent the SI prefix and the value (scaled according to the prefix), respectively. The default format matches the SI prefix style format.
- **exp_str** (*str or unicode*) – Format string where `{expof10}` and `{value}` represent the exponent of 10 and the value (scaled according to the exponent of 10), respectively. This format is used if the absolute exponent of 10 value is greater than 24.

Returns `value` formatted according to the SI prefix style.

Return type unicode

Examples

For example, with *precision=2*:

```
1e-27 --> 1.00e-27
1.764e-24 --> 1.76 y
7.4088e-23 --> 74.09 y
3.1117e-21 --> 3.11 z
1.30691e-19 --> 130.69 z
5.48903e-18 --> 5.49 a
2.30539e-16 --> 230.54 a
9.68265e-15 --> 9.68 f
4.06671e-13 --> 406.67 f
1.70802e-11 --> 17.08 p
7.17368e-10 --> 717.37 p
3.01295e-08 --> 30.13 n
1.26544e-06 --> 1.27 u
5.31484e-05 --> 53.15 u
0.00223223 --> 2.23 m
0.0937537 --> 93.75 m
3.93766 --> 3.94
165.382 --> 165.38
6946.03 --> 6.95 k
291733 --> 291.73 k
```

```
1.22528e+07 --> 12.25 M
5.14617e+08 --> 514.62 M
2.16139e+10 --> 21.61 G
9.07785e+11 --> 907.78 G
3.8127e+13 --> 38.13 T
1.60133e+15 --> 1.60 P
6.7256e+16 --> 67.26 P
2.82475e+18 --> 2.82 E
1.1864e+20 --> 118.64 E
4.98286e+21 --> 4.98 Z
2.0928e+23 --> 209.28 Z
8.78977e+24 --> 8.79 Y
3.6917e+26 --> 369.17 Y
1.55051e+28 --> 15.51e+27
6.51216e+29 --> 651.22e+27
```

Changed in version 1.0: Use unicode string for `format_str` and SI value format string to support micro (i.e., µ) characte, and change return type to unicode string.

See also:

Issue #4.

`si_prefix.`**`si_parse`**(*value*)

Parse a value expressed using SI prefix units to a floating point number.

Parameters **`value`** (*`str or unicode`*) – Value expressed using SI prefix units (as returned by *`si_format()`* function).

Changed in version 1.0: Use unicode string for SI unit to support micro (i.e., µ) character.

See also:

Issue #4.

`si_prefix.`**`si_prefix_expof10`**(*si_unit*)

Parameters **`si_unit`** (*`str`*) – SI unit character, i.e., one of "yzafpnµm kMGTPEZY".

Returns Exponent of the power of ten associated with *si_unit*, e.g., 3 for *si_unit=k* and -6 for *si_unit=µ*.

Return type int

`si_prefix.`**`si_prefix_scale`**(*si_unit*)

Parameters **`si_unit`** (*`str`*) – SI unit character, i.e., one of "yzafpnµm kMGTPEZY".

Returns Multiple associated with *si_unit*, e.g., 1000 for *si_unit=k*.

Return type int

`si_prefix.`**`split`**(*value*, *precision=1*)

Split *value* into value and "exponent-of-10", where "exponent-of-10" is a multiple of 3. This corresponds to SI prefixes.

Returns tuple, where the second value is the "exponent-of-10" and the first value is *value* divided by the "exponent-of-10".

Parameters

- **`value`** (*`int, float`*) – Input value.
- **`precision`** (*`int`*) – Number of digits after decimal place to include.

Returns The second value is the "exponent-of-10" and the first value is *value* divided by the "exponent-of-10".

Return type tuple

Examples

```
si_prefix.split(0.04781)   ->  (47.8, -3)
si_prefix.split(4781.123)  ->  (4.8, 3)
```

See `si_format()` for more examples.

CHAPTER 4

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