Unicode characters for engineers in Python (./unicode-characters-in-python.html)

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Unicode characters are very useful for engineers. A couple commonly used symbols in engineers include Omega and Delta. We can print these in python using unicode characters. From the Python interpreter we can type:

```
>>> print('Omega: \u03A9')
Omega: Ω
>>> print('Delta: \u0394')
Delta: Δ
>>> print('sigma: \u03C3')
sigma: σ
>>> print('mu: \u03BC')
mu: μ
>>> print('epsilon: \u03B5')
epsilon: ε
>>> print('degree: \u00B0')
degree: °
>>> print('6i\u0302 + 4j\u0302-2k\u0302')
6iˆ+ 4jˆ-2kˆ
```

All of these are unicode characters. Python has support for unicode characters built in. You can check if your system supports it by importing the `sys` module and calling the `sys.getdefaultencoding()` function

```
>>> import sys
>>> sys.getdefaulencoding()
'utf-8'
```

If you see `utf-8`, then your system supports unicode characters. To print any character in the Python interpreter, use a `\u` to denote a unicode character and then follow with the character code. For instance, the code for β is 03B2, so to print β the command is `print('\u03B2')`.

There are a couple of special characters that will combine symbols. A useful one in engineering is the hat `^` symbol. This is typically used to denote unit vectors. We can add a hat `^` (also called a circumflex) by putting the unicode escape after the letter you want to add a hat to. For example to add a hat to `i` the command is `print('i\u0302')`.

Below is a list of symbols and greek letters and the corresponding unicode escape to produce the character in python.

Useful unicode symbols in engineering

unicode	character	description
\u0394	Δ	GREEK CAPITAL LETTER DELTA
\u03A9	Ω	GREEK CAPITAL LETTER OMEGA
\u03C0	π	GREEK SMALL LETTER PI
\u03F4	ϴ	GREEK CAPITAL THETA SYMBOL
\u03BB	λ	GREEK SMALL LETTER LAMDA
\u03B8	θ	GREEK SMALL LETTER THETA
\u03B1	°	DEGREE SYMBOL
i\u0302	î	i HAT
j\u0302	ĵ	j HAT
k\u0302	k̂	k HAT
u\u0302	û	u HAT

Greek lower case letters

unicode	character	description
\u03B1	α	GREEK SMALL LETTER ALPHA
\u03B2	β	GREEK SMALL LETTER BETA
\u03B3	γ	GREEK SMALL LETTER GAMMA
\u03B4	δ	GREEK SMALL LETTER DELTA

unicode	character	description
\u03B5	ε	GREEK SMALL LETTER EPSILON
\u03B6	ζ	GREEK SMALL LETTER ZETA
\u03B7	η	GREEK SMALL LETTER ETA
\u03B8	θ	GREEK SMALL LETTER THETA
\u03B9	ι	GREEK SMALL LETTER IOTA
\u03BA	κ	GREEK SMALL LETTER KAPPA
\u03BB	λ	GREEK SMALL LETTER LAMDA
\u03BC	μ	GREEK SMALL LETTER MU
\u03BD	ν	GREEK SMALL LETTER NU
\u03BE	ξ	GREEK SMALL LETTER XI
\u03BF	ο	GREEK SMALL LETTER OMICRON
\u03C0	π	GREEK SMALL LETTER PI
\u03C1	ρ	GREEK SMALL LETTER RHO
\u03C2	ς	GREEK SMALL LETTER FINAL SIGMA
\u03C3	σ	GREEK SMALL LETTER SIGMA
\u03C4	τ	GREEK SMALL LETTER TAU
\u03C5	υ	GREEK SMALL LETTER UPSILON
\u03C6	φ	GREEK SMALL LETTER PHI
\u03C7	χ	GREEK SMALL LETTER CHI
\u03C8	ψ	GREEK SMALL LETTER PSI
\u03C9	ω	GREEK SMALL LETTER OMEGA

Greek upper case letters

unicode	character	description
\u0391	Α	GREEK CAPITAL LETTER ALPHA
\u0392	Β	GREEK CAPITAL LETTER BETA
\u0393	Γ	GREEK CAPITAL LETTER GAMMA
\u0394	Δ	GREEK CAPITAL LETTER DELTA

unicode	character	description
\u0395	Ε	GREEK CAPITAL LETTER EPSILON
\u0396	Ζ	GREEK CAPITAL LETTER ZETA
\u0397	Η	GREEK CAPITAL LETTER ETA
\u0398	Θ	GREEK CAPITAL LETTER THETA
\u0399	Ι	GREEK CAPITAL LETTER IOTA
\u039A	Κ	GREEK CAPITAL LETTER KAPPA
\u039B	Λ	GREEK CAPITAL LETTER LAMDA
\u039C	Μ	GREEK CAPITAL LETTER MU
\u039D	Ν	GREEK CAPITAL LETTER NU
\u039E	Ξ	GREEK CAPITAL LETTER XI
\u039F	Ο	GREEK CAPITAL LETTER OMICRON
\u03A0	Π	GREEK CAPITAL LETTER PI
\u03A1	Ρ	GREEK CAPITAL LETTER RHO
\u03A3	Σ	GREEK CAPITAL LETTER SIGMA
\u03A4	Τ	GREEK CAPITAL LETTER TAU
\u03A5	Υ	GREEK CAPITAL LETTER UPSILON
\u03A6	Φ	GREEK CAPITAL LETTER PHI
\u03A7	Χ	GREEK CAPITAL LETTER CHI
\u03A8	Ψ	GREEK CAPITAL LETTER PSI
\u03A9	Ω	GREEK CAPITAL LETTER OMEGA
\u03F4	ϴ	GREEK CAPITAL THETA SYMBOL

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About Peter Kazarinoff

I teach engineering at a community college in the Pacific Northwest. I am interested in programming and how to help students. Here I mostly blog about Python, and how programing can be incorporated into engineering education.

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