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# **pybase64 Documentation**

***Release 1.1.0***

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Fast Base64 implementation for Python.



## GETTING STARTED

pybase64 is a wrapper on [libbase64](#).

It aims to provide a fast base64 implementation for base64 encoding/decoding.

### 1.1 Installation

```
pip install pybase64
```

### 1.2 Usage

pybase64 uses the same API as Python [base64](#) “modern interface” (introduced in Python 2.4) for an easy integration.

To get the fastest decoding, it is recommended to use the `b64decode()` and `validate=True` when possible.

```
import pybase64

print(pybase64.b64encode(b'>>>foo???' , altchars='_:'))
# b'Pj4_Zm9vPz8:'
print(pybase64.b64decode(b'Pj4_Zm9vPz8:', altchars='_:', validate=True))
# b'>>>foo???'

# Standard encoding helpers
print(pybase64.standard_b64encode(b'>>>foo???'))
# b'Pj4+Zm9vPz8/'
print(pybase64.standard_b64decode(b'Pj4+Zm9vPz8/'))
# b'>>>foo???'

# URL safe encoding helpers
print(pybase64.urlsafe_b64encode(b'>>>foo???'))
# b'Pj4-Zm9vPz8_'
print(pybase64.urlsafe_b64decode(b'Pj4-Zm9vPz8_'))
# b'>>>foo???'
```

Check [API Reference](#) for more details.

A command-line tool is also provided. It has encode, decode and benchmark subcommands.

```
usage: pybase64 [-h] [-V] {benchmark,encode,decode} ...

pybase64 command-line tool.

positional arguments:
  {benchmark,encode,decode}
                        tool help
  benchmark             -h for usage
  encode                -h for usage
  decode               -h for usage

optional arguments:
  -h, --help            show this help message and exit
  -V, --version         show program's version number and exit
```

## 1.3 Benchmark

Running Python 3.7.2, Apple LLVM version 10.0.0 (clang-1000.11.45.5), Mac OS X 10.14.2 on an Intel Core i7-4870HQ @ 2.50GHz

```
pybase64 0.5.0 (C extension active - AVX2)
bench: altchars=None, validate=False
pybase64.__pybase64.encodebytes: 1734.776 MB/s (13,271,472 bytes -> 17,928,129 bytes)
pybase64.__pybase64.b64encode: 4039.539 MB/s (13,271,472 bytes -> 17,695,296 bytes)
pybase64.__pybase64.b64decode: 1854.423 MB/s (17,695,296 bytes -> 13,271,472 bytes)
base64.encodebytes: 78.352 MB/s (13,271,472 bytes -> 17,928,129 bytes)
base64.b64encode: 539.840 MB/s (13,271,472 bytes -> 17,695,296 bytes)
base64.b64decode: 287.826 MB/s (17,695,296 bytes -> 13,271,472 bytes)
bench: altchars=None, validate=True
pybase64.__pybase64.b64encode: 4156.607 MB/s (13,271,472 bytes -> 17,695,296 bytes)
pybase64.__pybase64.b64decode: 4107.997 MB/s (17,695,296 bytes -> 13,271,472 bytes)
base64.b64encode: 559.342 MB/s (13,271,472 bytes -> 17,695,296 bytes)
base64.b64decode: 143.674 MB/s (17,695,296 bytes -> 13,271,472 bytes)
bench: altchars=b'-'_, validate=False
pybase64.__pybase64.b64encode: 2786.776 MB/s (13,271,472 bytes -> 17,695,296 bytes)
pybase64.__pybase64.b64decode: 1124.136 MB/s (17,695,296 bytes -> 13,271,472 bytes)
base64.b64encode: 322.427 MB/s (13,271,472 bytes -> 17,695,296 bytes)
base64.b64decode: 205.195 MB/s (17,695,296 bytes -> 13,271,472 bytes)
bench: altchars=b'-'_, validate=True
pybase64.__pybase64.b64encode: 2806.271 MB/s (13,271,472 bytes -> 17,695,296 bytes)
pybase64.__pybase64.b64decode: 2740.456 MB/s (17,695,296 bytes -> 13,271,472 bytes)
base64.b64encode: 314.709 MB/s (13,271,472 bytes -> 17,695,296 bytes)
base64.b64decode: 121.803 MB/s (17,695,296 bytes -> 13,271,472 bytes)
```



## API REFERENCE

### 2.1 Main API Reference

`pybase64.b64encode(s, altchars=None)`

Encode bytes using the standard Base64 alphabet.

Argument `s` is a `bytes-like object` to encode.

Optional `altchars` must be a byte string of length 2 which specifies an alternative alphabet for the '+' and '/' characters. This allows an application to e.g. generate url or filesystem safe Base64 strings.

The result is returned as a `bytes` object.

`pybase64.b64encode_as_string(s, altchars=None)`

Encode bytes using the standard Base64 alphabet.

Argument `s` is a `bytes-like object` to encode.

Optional `altchars` must be a byte string of length 2 which specifies an alternative alphabet for the '+' and '/' characters. This allows an application to e.g. generate url or filesystem safe Base64 strings.

The result is returned as a `str` object.

`pybase64.b64decode(s, altchars=None, validate=False)`

Decode bytes encoded with the standard Base64 alphabet.

Argument `s` is a `bytes-like object` or ASCII string to decode.

Optional `altchars` must be a `bytes-like object` or ASCII string of length 2 which specifies the alternative alphabet used instead of the '+' and '/' characters.

If `validate` is `False` (the default), characters that are neither in the normal base-64 alphabet nor the alternative alphabet are discarded prior to the padding check. If `validate` is `True`, these non-alphabet characters in the input result in a `binascii.Error`.

The result is returned as a `bytes` object.

A `binascii.Error` is raised if `s` is incorrectly padded.

`pybase64.b64decode_as_bytearray(s, altchars=None, validate=False)`

Decode bytes encoded with the standard Base64 alphabet.

Argument `s` is a `bytes-like object` or ASCII string to decode.

Optional `altchars` must be a `bytes-like object` or ASCII string of length 2 which specifies the alternative alphabet used instead of the '+' and '/' characters.

If `validate` is `False` (the default), characters that are neither in the normal base-64 alphabet nor the alternative alphabet are discarded prior to the padding check. If `validate` is `True`, these non-alphabet characters in the input result in a `binascii.Error`.

The result is returned as a `bytearray` object.

A `binascii.Error` is raised if `s` is incorrectly padded.

## 2.2 Helpers API Reference

`pybase64.standard_b64encode(s)`

Encode bytes using the standard Base64 alphabet.

Argument `s` is a `bytes-like object` to encode.

The result is returned as a `bytes` object.

`pybase64.standard_b64decode(s)`

Decode bytes encoded with the standard Base64 alphabet.

Argument `s` is a `bytes-like object` or ASCII string to decode.

The result is returned as a `bytes` object.

A `binascii.Error` is raised if the input is incorrectly padded.

Characters that are not in the standard alphabet are discarded prior to the padding check.

`pybase64.urlsafe_b64encode(s)`

Encode bytes using the URL- and filesystem-safe Base64 alphabet.

Argument `s` is a `bytes-like object` to encode.

The result is returned as a `bytes` object.

The alphabet uses `'-'` instead of `'+'` and `'_'` instead of `'/'`.

`pybase64.urlsafe_b64decode(s)`

Decode bytes using the URL- and filesystem-safe Base64 alphabet.

Argument `s` is a `bytes-like object` or ASCII string to decode.

The result is returned as a `bytes` object.

A `binascii.Error` is raised if the input is incorrectly padded.

Characters that are not in the URL-safe base-64 alphabet, and are not a plus `'+'` or slash `'/'`, are discarded prior to the padding check.

The alphabet uses `'-'` instead of `'+'` and `'_'` instead of `'/'`.

## 2.3 Legacy API Reference

`pybase64.encodebytes(s)`

Encode bytes into a bytes object with newlines (`b' \n'`) inserted after every 76 bytes of output, and ensuring that there is a trailing newline, as per [RFC 2045](#) (MIME).

Argument `s` is a `bytes-like object` to encode.

The result is returned as a `bytes` object.

## 2.4 Information API Reference

`pybase64.get_version()`

Returns pybase64 version as a `str` object.

The result reports if the C extension is used or not. e.g. *1.0.0 (C extension active - AVX2)*

`pybase64.get_license_text()`

Returns pybase64 license information as a `str` object.

The result includes libbase64 license information as well.



## CHANGELOG

### 3.1 1.1.0

- Add `b64encode_as_string`, same as `b64encode` but returns a `str` object instead of a `bytes` object
- Add `b64decode_as_bytearray`, same as `b64decode` but returns a `bytearray` object instead of a `bytes` object
- Speed-Up decoding from UCS1 strings

### 3.2 1.0.2

- Update `base64` library
- Publish python 3.9 wheels

### 3.3 1.0.1

- Publish python 3.8 wheels

### 3.4 1.0.0

- Drop python 3.4 support
- Drop python 2.7 support

### 3.5 0.5.0

- Publish python 3.7 wheels
- Drop python 3.3 support

## 3.6 0.4.0

- Speed-up decoding when `validate==False`

## 3.7 0.3.1

- Fix deployment issues

## 3.8 0.3.0

- Add `encodebytes` function

## 3.9 0.2.1

- Fixed invalid results on Windows

## 3.10 0.2.0

- Added documentation
- Added subcommands to the main script:
  - `help`
  - `version`
  - `encode`
  - `decode`
  - `benchmark`

## 3.11 0.1.2

- Updated base64 native library

## 3.12 0.1.1

- Fixed deployment issues

## 3.13 0.1.0

- First public release





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### 4.1 pybase64

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