Is __init__.py not required for packages in Python 3?

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I am using Python 3.5.1. I read the document and the package section here: https://docs.python.org/3/tutorial/modules.html#packages

Now, I have the following structure:

```
/home/wujek/Playground/a/b/module.py
```

`module.py`:

```
class Foo:
    def __init__(self):
        print('initializing Foo')
```

Now, while in `/home/wujek/Playground`:

```
~/Playground $ python3
>>> import a.b.module
>>> a.b.module.Foo()
initializing Foo
<a.b.module.Foo object at 0x100a8f0b8>
```

Similarly, now in home, superfolder of `Playground`:

```
~ $ PYTHONPATH=Playground python3
>>> import a.b.module
>>> a.b.module.Foo()
initializing Foo
<a.b.module.Foo object at 0x10a5fee10>
```

Actually, I can do all kinds of stuff:

```
~ $ PYTHONPATH=Playground python3
>>> import a
>>> import a.b
>>> import Playground.a.b
```

Why does this work? I though there needed to be `__init__.py` files (empty ones would work) in both `a` and `b` for `module.py` to be importable when the Python path points to the `Playground` folder?

This seems to have changed from Python 2.7:

```
~ $ PYTHONPATH=Playground python
>>> import a
ImportError: No module named a
>>> import a.b
ImportError: No module named a.b
>>> import a.b.module
ImportError: No module named a.b.module
```

With `__init__.py` in both `~/Playground/a` and `~/Playground/a/b` it works fine.

python python-3.x package

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edited May 10 '16 at 13:48
Mike Müller
55.6k ● 10 ● 89 ● 105

asked May 10 '16 at 13:19
wujek
2,792 ● 8 ● 29 ● 58

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3 Answers

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Python 3.3+ has Implicit Namespace Packages that allow it to create a packages without an `__init__.py` file.

> Allowing implicit namespace packages means that the requirement to provide an `__init__.py` file **can be dropped completely**, and affected ... .

The old way with `__init__.py` files still works as in Python 2.

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edited Dec 13 '18 at 1:46
martineau
70.9k ● 10 ● 93 ● 187

answered May 10 '16 at 13:35
Mike Müller
55.6k ● 10 ● 89 ● 105

7 I will read the document, but it's a bit long. Is it possible to quickly summarize? Could you just tell me: does it still support **init**.py, or completely ignores them? If it does support them, what is the difference in functionality and why this duality? – wujek May 10 '16 at 13:38

1 Yes, it still works. So all your Python 2 packages with `__init__.py` files will work in terms of imports (other difference between Python 2 and 3 not considered here). – Mike Müller May 10 '16 at 13:41

2 So the tutorial should be probably updated. Is a documentation bug opened for it? – Michel Samia Dec 27 '17 at 15:22

3 @JayRizzo But: "Although practicality beats purity." – Mike Müller Jun 11 '18 at 6:58

6 @JayRizzo IMO it is even more explicit. Sometimes it happens to do init stuff in `__init__.py`, sometimes not. In Python 3 when I need these stuff I create a new `__init__.py` with specific code, otherwise I don't. This comes handy to know, visually, which packages have custom init. Instead in python 2 I always have to place an `__init__.py` (often empty), making a great number of them and finally harder to remember where you placed your init code. This should also fit "There should be one-- and preferably only one --obvious way to do it.". – Paolo Jul 14 '18 at 18:22

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IMPORTANT

@Mike's answer is correct but too imprecise. It is true that Python 3.3+ supports *Implicit Namespace Packages* that allows it to create a package without an `__init__.py` file.

This however, ONLY applies to **EMPTY** **`__init__.py`** files. So **EMPTY** **`__init__.py`** files are no longer necessary and can be omitted. If you want to run a particular initialization script when the package or any of its modules or sub-packages are imported, you still require an **`__init__.py`** file. This is a great Stack Overflow answer for why you would want to use an `__init__.py` file to do some further initialization in case you wondering why this is in any way useful.

Directory Structure Example:

```
  parent_package/
     __init__.py            <- EMPTY, NOT NECESSARY in Python 3.3+
     child_package/
          __init__.py       <- STILL REQUIRED if you want to run an initialization sc
          child1.py
          child2.py
          child3.py
```

`parent_package/child_package/__init__.py`:

```
print("from parent")
```

EXAMPLES

The below examples demonstrate how the initialization script is executed when the `child_package` or one of its modules is imported.

Example 1:

```
from parent_package import child_package  # prints "from parent"
```

Example 2:

```
from parent_package.child_package import child1  # prints "from parent"
```

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edited Feb 3 at 22:09

answered Feb 15 '18 at 10:16
AndreasLukas
2,696 ● 1 ● 20 ● 24

2 Suppose I have `run_script.py` in same dir as `parent_package` so can I just import like `from parent_package.child_package import child1` without `__init__.py`? – mrgloom May 16 '18 at 15:10

Is the purpose of this so you can write child_package.some_function even if some_function is defined in childX.py? In another words it avoids requiring the user to know about the different files in child_package? ? – johnbakers Jun 25 '18 at 13:29

Yeah, I don't get why you would make `child1.py`, `child2.py` instead of just putting their code together into `__init__`.py directly. – binki Nov 26 '18 at 0:10

Shouldn't the import statements in `__init__` be relative imports i.e. `from . import child1`? The absolute import gives me `ModuleNotFoundError` (in Python 3.6) – Halbeard Feb 3 at 13:34

Thanks @HalberdRejoyceth, I edited my answer :) – AndreasLukas Feb 3 at 21:57

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I would say that one should omit the `__init__.py` only if one wants to have the implicit namespace package. If you don't know what it means, you probably don't want it and therefore you should continue to use the `__init__.py` even in Python 3.

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answered Mar 5 at 8:29
Mi-La
178 ● 2 ● 10

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