

What is an Integer?

In Mathematics:

An integer is a number that has no fractional¹ component. The term ‘integer’ in Latin means ‘whole.’ So an Integer is a Whole Number². A person who practises *wholesome* behaviour is a person with *integrity*.

In Number Theory, the set of integers is very often represented by a boldface Capital ‘Z’³:

Z

Sometimes, in Number Theory, the set of integers is represented by a blackboard bold ‘Z’:

ℤ

The set of integers comprises:

- the number:

0

- the sequence of positive Natural Numbers:

{1, 2, 3, 4, 5 ...}

- the sequence of negative integers:

{-1, -2, -3, -4, -5 ...}

¹ Whereas ‘integer’ comes from the Latin word for ‘whole,’ ‘fraction’ comes from the Latin supine ‘frāctum,’ which means ‘broken.’ The term ‘fraction’ is derived from the Latin 3rd-conjugation verb, frangō, frangere, frēgī, frāctum,’ which means ‘to break,’ ‘to shatter.’ If something be *fragile*, then it is easily broken; it is liable to shatter. A *fraction*, etymologically, is like a broken-off piece of a number.

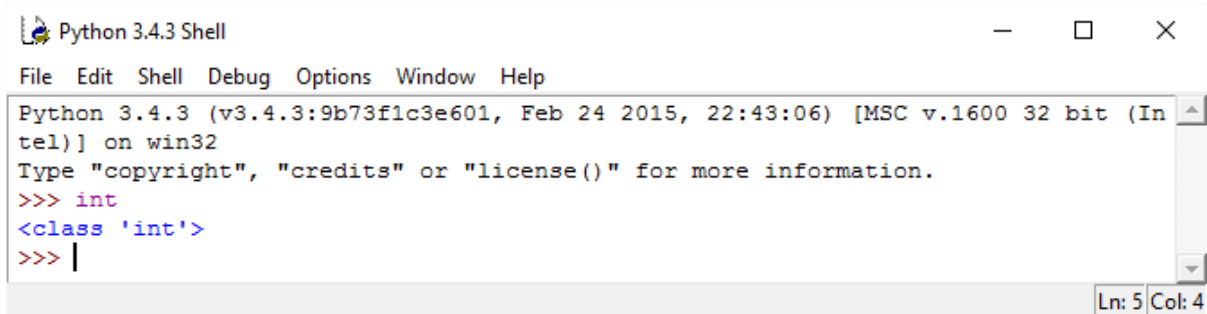
² I speak, here, in general parlance. Mathematically, some would argue a difference between whole numbers and integers. Mathematicians sometimes regard whole numbers as comprising the sequence of positive integers: {0, 1, 2, 3, 4, 5...}. I am merely trying to get across the concept that an Integer has no fractional part.

³ The ‘Z’ represents the plural of the German feminine noun, ‘die Zahl,’ ‘the number,’ which is ‘die Zahlen.’

In Python:

In Python, integers are a datatype. This datatype is assigned the keyword:

int



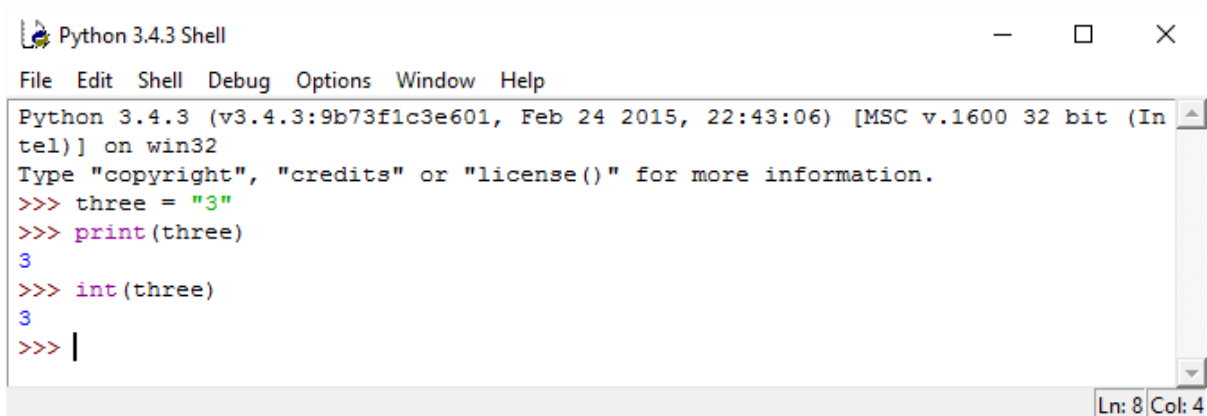
```
Python 3.4.3 Shell
File Edit Shell Debug Options Window Help
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 24 2015, 22:43:06) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> int
<class 'int'>
>>> |
```

Figure 1: In Python, the int keyword represents the integer datatype.

In Python, we can use the:

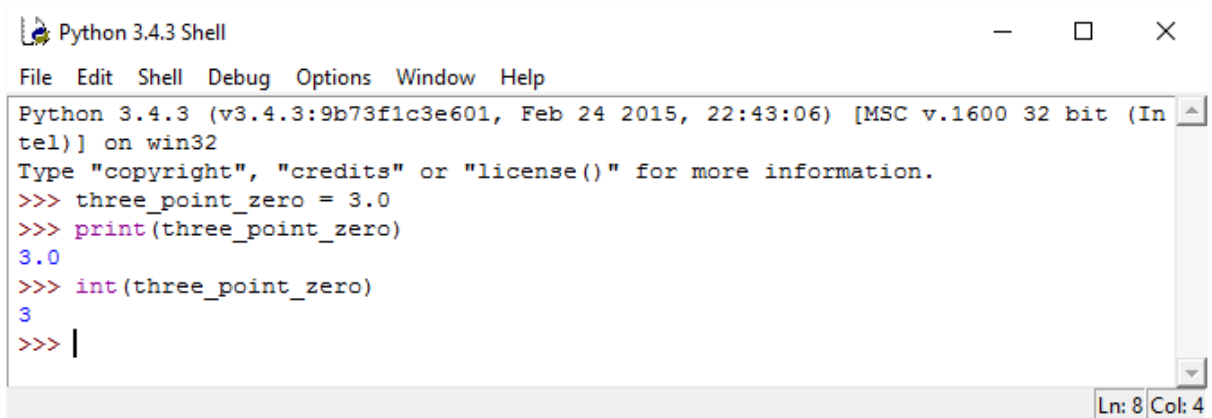
int()

method so as to convert numbers that might exist as strings, or other datatypes, to integers:



```
Python 3.4.3 Shell
File Edit Shell Debug Options Window Help
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 24 2015, 22:43:06) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> three = "3"
>>> print(three)
3
>>> int(three)
3
>>> |
```

Figure 2: In the above example, we convert the number, 3, from a Python string to a Python integer by using the int() method. This is called ‘type conversion.’

A screenshot of a Python 3.4.3 Shell window. The window title is "Python 3.4.3 Shell" and it has standard Windows window controls (minimize, maximize, close). The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The main text area shows the following code and output:

```
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 24 2015, 22:43:06) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> three_point_zero = 3.0
>>> print(three_point_zero)
3.0
>>> int(three_point_zero)
3
>>> |
```

The status bar at the bottom right indicates "Ln: 8 Col: 4".

Figure 3: In the above example, we convert the number, 3.0, from a Python float to a Python integer by using the `int()` method. This is called ‘type conversion.’

Glossary:

integer

▪ *noun.*

1. a number which is not a fraction; a whole number.
2. a thing complete in itself.

<ORIGIN early 16th century (as an adjective meaning ‘entire, whole’): from Latin, ‘intact, whole’, from *in-* (expressing negation) + the root of *tangere* ‘to touch’. Compare with **ENTIRE**, also with **Integral**, **integrate**, and **INTEGRITY**⁴.

<ETYMOLOGY> From the Latin 1st-and-2nd-declension adjective, ‘*integra, integer, integrum,*’ which means ‘complete,’ ‘whole,’ ‘intact.’ From the Latin prefix ‘*in-*,’ which expresses negation; and the Latin verb ‘*tangō, tangere, tetigī, tāctum,*’ which means ‘to touch.’ Etymologically, therefore, an ‘integer’ is a number that is ‘intact’ i.e. which does not have a fractional component.

⁴ Oxford University Press. *Oxford Dictionary of English* (Electronic Edition). Oxford. 2010. Loc 357261