

Exercise 9: Conversion statements and modulo

It is important in Python to remember that Python automatically will assign its own data type. During our programming to date we have looked at 4 different data types – int, float, str, bool. In other programming languages this is not the case

Return back to the first exercise you did regarding animals and their types.

You entered code to display similar to this –

```
name of animal: Elephant
number of legs: 4
height of animal: 4.5
animal with tail: True
```

Python can show you the data types by using a new statement, instead of using a statement

```
Print(name)
```

```
Use print (type(name))
```

This would display the code like this –

```
name of animal: Elephant
<class 'str'>
number of legs: 4
<class 'int'>
height of animal: 4.5
<class 'float'>
animal with tail: True
<class 'bool'>
```

If this is the case, why do we need programs which you have to assign data types? (Hint: remember if a variable is assigned twice the later value replaces the first?)

If we printed the height of animal with the following:

```
Height=int(4.5)
```

```
Print (Height)
```

What would it display?

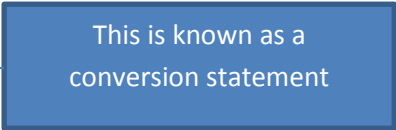
```
name="Elephant"
```

```
numLegs=4
```

```
height=4.5
```

```
hasTail=True
```

```
height = int(height)
```



This is known as a
conversion statement

It is possible to do the following....

```
name="Elephant"
```

```
numLegs=4
height=4.5
hasTail=True
```

```
heightReal = float(height)
height = int(height)
```

Note the two conversion statements and the order they are in

It doesn't matter if the real height is displayed after the height code as long as the order of the conversion statement is in the right place. What happens if the conversion statement for heightReal followed the conversion statement for height?

Division

Difficulties lie with dividing numbers....

If we do the following

6/2 our answer is 3....

The computer would display this as 3.0

But if we had 15/7 our answer is?

It will always show our answers as a float rather than an integer.

Challenge A

You have 18 bars of chocolate and want to divide them evenly among 5 people. It is possible to break each bar into 7 squares. How many whole bars of chocolate will each person get? How many squares will be left over?

Calculate and display as follows:

```
Whole chocolate bars each: 3
Extra squares each: 4
Squares left over: 1
```

To work out wholes and remainders we will need our numbers to be integers and not convert to a float.

Use the following code:

15//7 (this evaluates to 2 showing the whole)

15%7 (this will show the remainder as a whole number, this is called **modulo**)

Challenge B

There are 131 children who want to play netball. Each team needs 7 players and 2 subs. How many children will not be in a team without finding more players?

```
Number of teams: 14
Number of children left over: 5
```

Challenge C

Given a number of seconds, display the length of time in terms of whole minutes and seconds.

184 seconds is 3 minutes and 4 seconds

Challenge D

I have £6.50. I want to buy a chocolate bar (67 pence) for each of my 3 friends, and spend the change on apples at 50 pence per apple. How many apples will I get?

Make this program flexible (easy to modify) because next week I may have more friends, or the price of chocolate or apples may have changed dependent on where I have purchased them from.

Money for chocolate: £2.01

Money for apples: £4.45

Number of apples: 8

Extend this program to show change left over.