Computing

Lesson 2: Crunching numbers

Introduction to Python programming

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Materials from the Teach Computing Curriculum created by the National Centre for Computing Education

Order matters

Step 1 Investigate the program

```
1 print(secs,"seconds is",mins,"whole minutes")
2 mins = secs // 60
3 secs = 2567
```

For each of the sentences below, write down which line(s) of code it applies to:

A. **assigns** a value to the `secs` variable

B. **assigns** a value to the `mins` variable

C. **refers** to the value of the `secs` variable

D. **refers** to the value of the `mins` variable

Step 2 Find and run the program

A. **Access** the original file using this link: **oaknat.uk/comp-py-order-20**
B. **Run** the program.

You will be faced with an error message on **line 1**:

```
NameError: name 'secs' is not defined
```

The statement on **line 1** is executed first, and that statement refers to the `secs` variable. However, no value has been assigned to `secs`, hence the `NameError`.

Step 3 Rearrange the program code

Rearrange (change the order of) the statements, so that the program runs to completion and displays the following message:

```
2567 seconds is 42 whole minutes
```

There are three things that you will need to remember:

- The program is supposed to convert a length of time from seconds to minutes.
- Program statements are executed in sequence, one after the other.
- When a variable is **referred to** in a statement, it must have previously been **assigned** a value, otherwise a `NameError` will arise.

What do we weigh on the moon?

What do we weigh on the moon?

Your science teacher asks you to make a program that reads the user's weight on Earth and calculates how much the user will weigh on the moon.

You do some research and find out that gravity on the moon is a sixth (⅙) of what it is on Earth.

Source: Pixabay

Example input and output

Here is an example of how the program might work.

Example

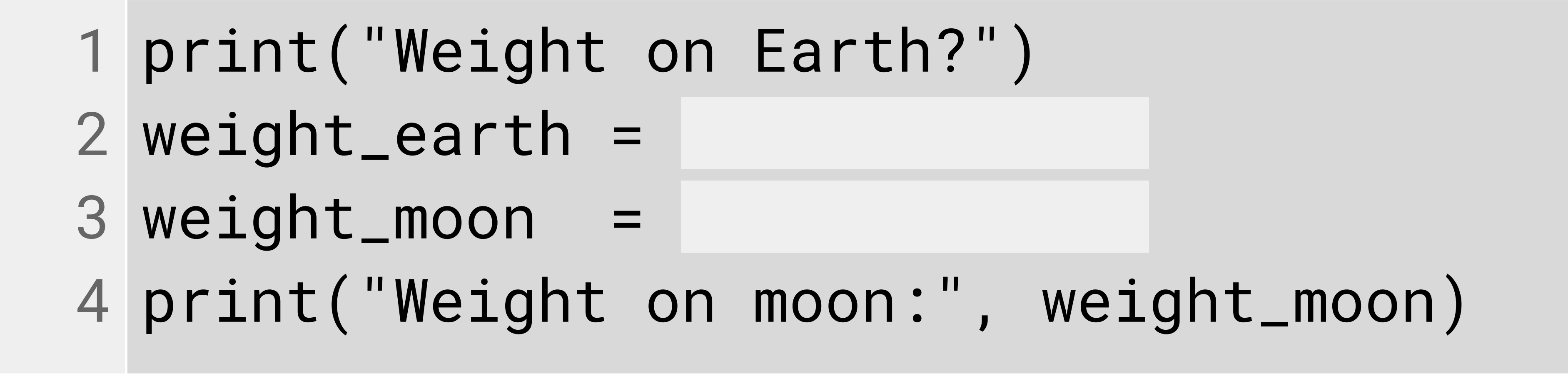
Note: Use these numbers to test that your program works correctly. In general, the result displayed depends on user input, so it will not always be the same.

The program displays a prompt and waits for keyboard input.	`Weight on Earth?`
The user types in a reply.	`60`
The program displays the result.	`Weight on moon: 10.0`

Step 1 Open the program

A program has already been started for you but it is incomplete.

Access the program using the link: **oaknat.uk/comp-py-moon-20**



```
print("Weight on Earth?")
weight_earth = 
weight_moon  = 
print("Weight on moon:", weight_moon)
```

Step 2 Complete the program

A. Complete **line 2** so that the program receives `input` from the keyboard, after displaying a prompt to the user. Make sure that the value assigned to the `weight_earth` variable is an **integer**.

B. Complete **line 3** so that the program calculates the weight on the moon to be one sixth (⅙) of the weight on Earth, i.e. one sixth of the value of the `weight_earth` variable.

TIP: Divide `weight_earth` by 6

Your age in dog years

Your age in dog years

You are going to make a program that reads the user’s age and calculates how old the user is in dog years. The common perception is that a human year is equal to 7 dog years.

Source: Pixabay

Example input and output

Here is an example of how the program might work.

Example

Note: Use these numbers to test that your program works correctly. In general, the result displayed depends on user input, so it will not always be the same.

The program displays a prompt and waits for keyboard input.	`How old are you?`
The user types in a reply.	`5`
The program displays the result.	`You are 35 years old in dog years`

Task Write the program

Using the two programs that you have created in this lesson, create a program to calculate your age in dog years.

TIP:

You will need to use:

- `print` for displaying messages to the user
- `input` for receiving keyboard input
- `int` for converting values to integers (whenever possible)
- `=` for performing assignments of expression values to variables
- `*` for multiplication