Programming with Python

Introduction

Berner Fachhochschule

History of Python*

- Developed by Guido van Rossum in Amsterdam in the early 1990s.
- Object-oriented and modular from the start
- 1994: Supplemented by functional concepts (lambda)
- 2000: Complemented by garbage collection and Unicode
- Current version: Python 3 (Python 3.10…)

* Tribute to the British comedy group *Monty Python*

What can Python do?

Python is used

- to create prototypes or scripts
- on the Server (server side of the web application)
- to read or write data (Files or Databases)
- to solve mathematical problems (statistics, data analysis, visualization, games,...)
- …

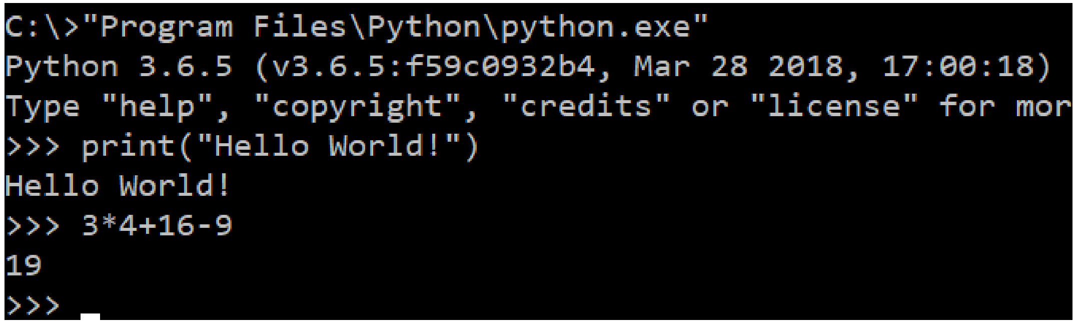
Benefits of Python

- Python works on various platforms (Windows, Mac, Linus, Raspberry Pi, ...)
- Python has a simple syntax and is therefore easy to learn
- Python programs come with little overhead
- Python can be used procedurally, functionally or object-oriented

Your First Python Program

Python can be run directly from the console

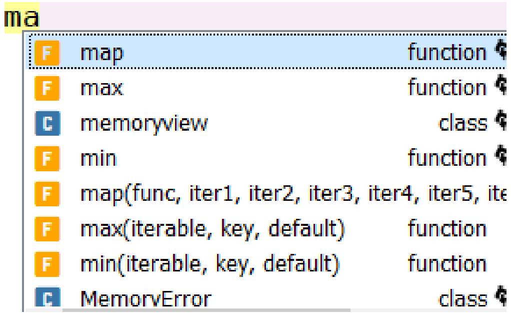
```
C:\>"Program Files\Python\python.exe"
>>> print("Hello Word!")
Hello World!
>>> 3*4+16-9
19
>>>
```



```
C:\>"Program Files\Python\python.exe"
Python 3.6.5 (v3.6.5:f59c0932b4, Mar 28 2018, 17:00:18)
Type "help", "copyright", "credits" or "license" for mor
>>> print("Hello World!")
Hello World!
>>> 3*4+16-9
19
>>> _
```

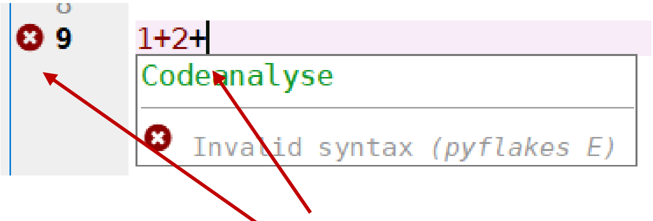
Programming environment

Programming is more convenient with support for a programming environment that knows the commands and displays typos.



```
ma
F  map                                        function
F  max                                        function
C  memoryview                                    class
F  min                                        function
F  map(func, iter1, iter2, iter3, iter4, iter5, ite
F  max(iterable, key, default)                function
F  min(iterable, key, default)                function
C  MemoryError                                   class
```

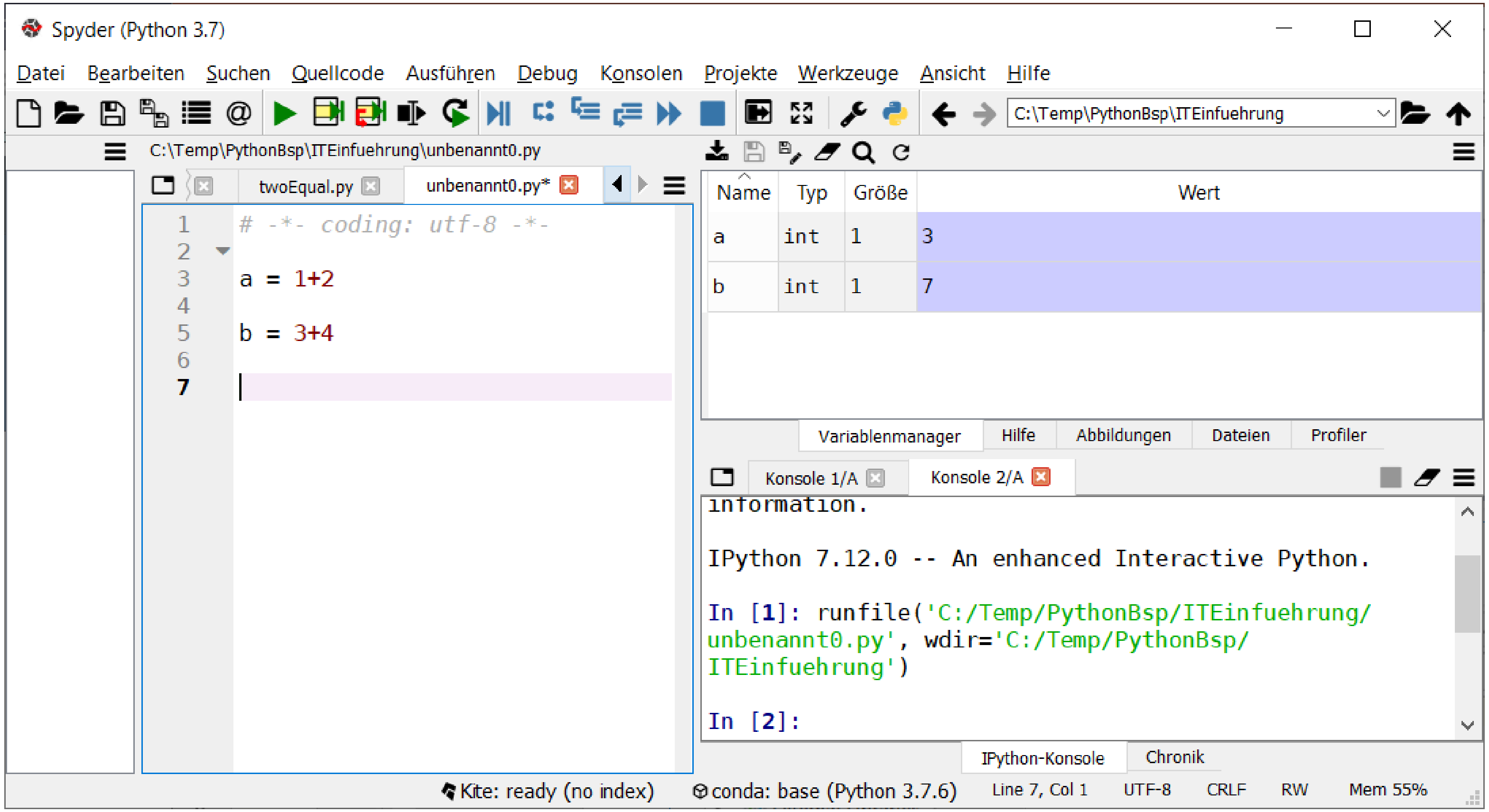
All commands starting with "ma" are displayed



```
1+2+
Codeanalyse
Invalid syntax (pyflakes E)
```

Errors are displayed

Spyder Programming Environment

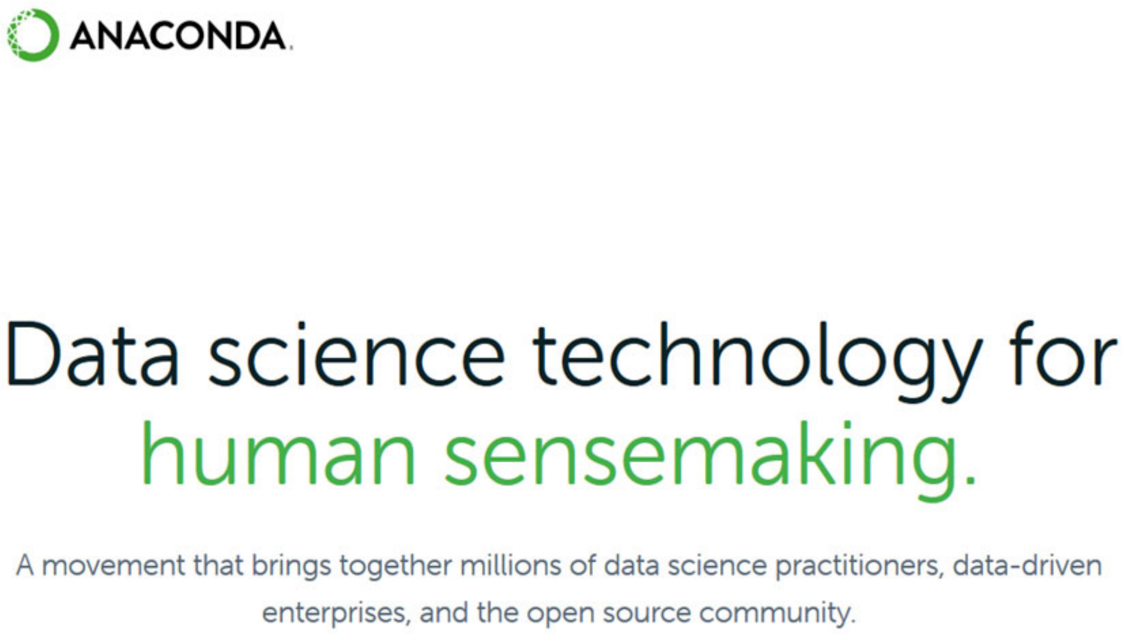

Spyder (Python 3.7)
Datei Bearbeiten Suchen Quellcode Ausführen Debug Konsolen Projekte Werkzeuge Ansicht Hilfe
C:\Temp\PythonBsp\ITEinfuehrung
C:\Temp\PythonBsp\ITEinfuehrung\unbenannt0.py
twoEqual.py
unbenannt0.py*
Variablenmanager
Hilfe
Abbildungen
Dateien
Profiler
Konsole 1/A
Konsole 2/A
IPython-Konsole
Chronik
Kite: ready (no index)
conda: base (Python 3.7.6)
Line 7, Col 1
UTF-8
CRLF
RW
Mem 55%

```
# -*- coding: utf-8 -*-

a = 1+2

b = 3+4

```

Name	Typ	Größe	Wert
a	int	1	3
b	int	1	7

```
information.

IPython 7.12.0 -- An enhanced Interactive Python.

In [1]: runfile('C:/Temp/PythonBsp/ITEinfuehrung/
unbenannt0.py', wdir='C:/Temp/PythonBsp/
ITEinfuehrung')

In [2]:
```

Miniconda / Anaconda / Spyder

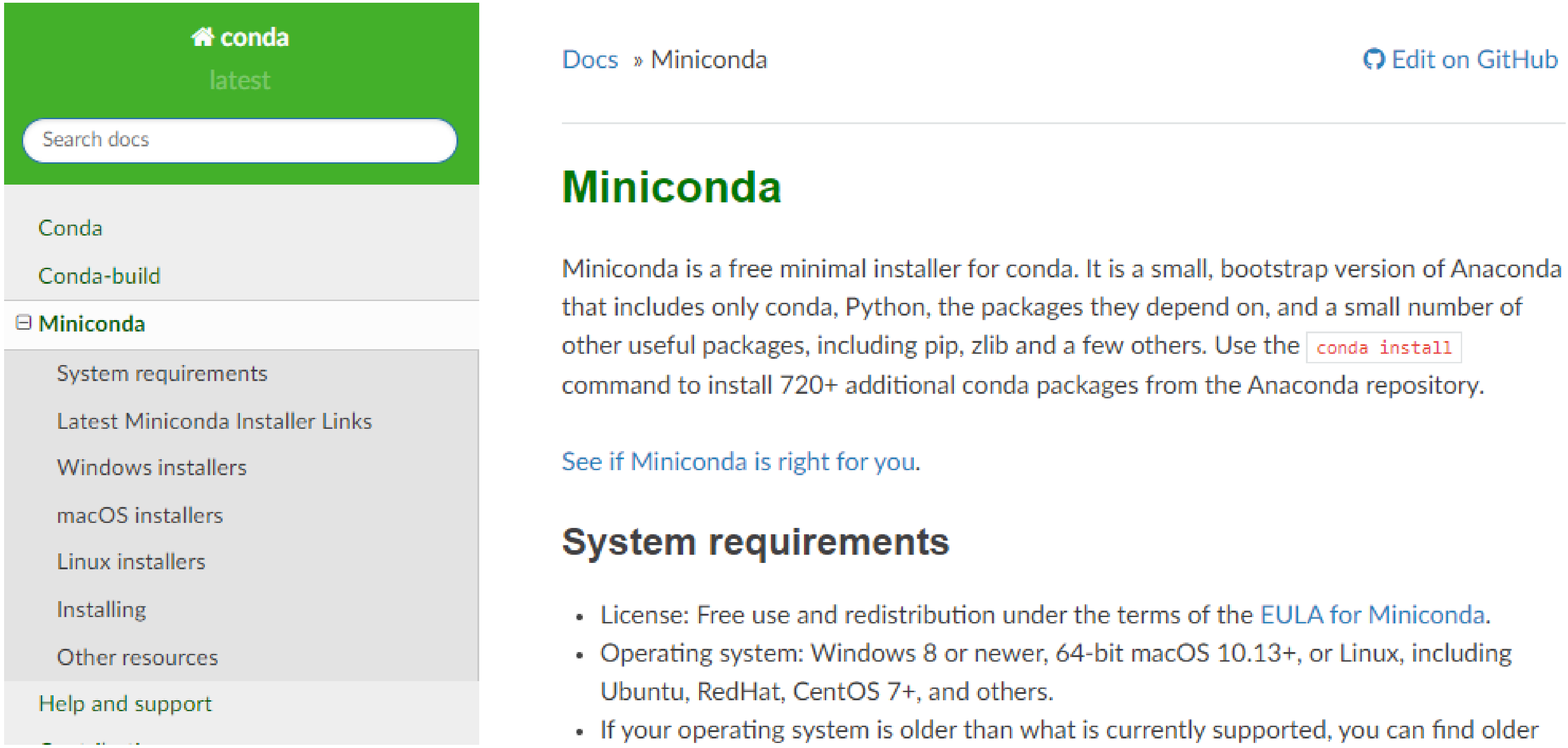


ANACONDA.

Data science technology for human sensemaking.

A movement that brings together millions of data science practitioners, data-driven enterprises, and the open source community.

Installation



Miniconda

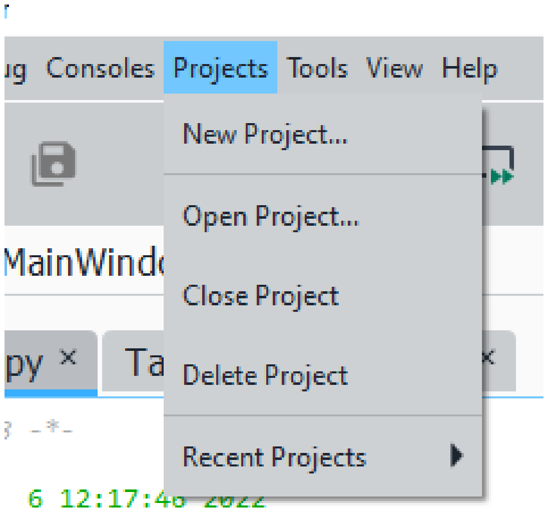
Miniconda is a free minimal installer for conda. It is a small, bootstrap version of Anaconda that includes only conda, Python, the packages they depend on, and a small number of other useful packages, including pip, zlib and a few others. Use the `conda install` command to install 720+ additional conda packages from the Anaconda repository.

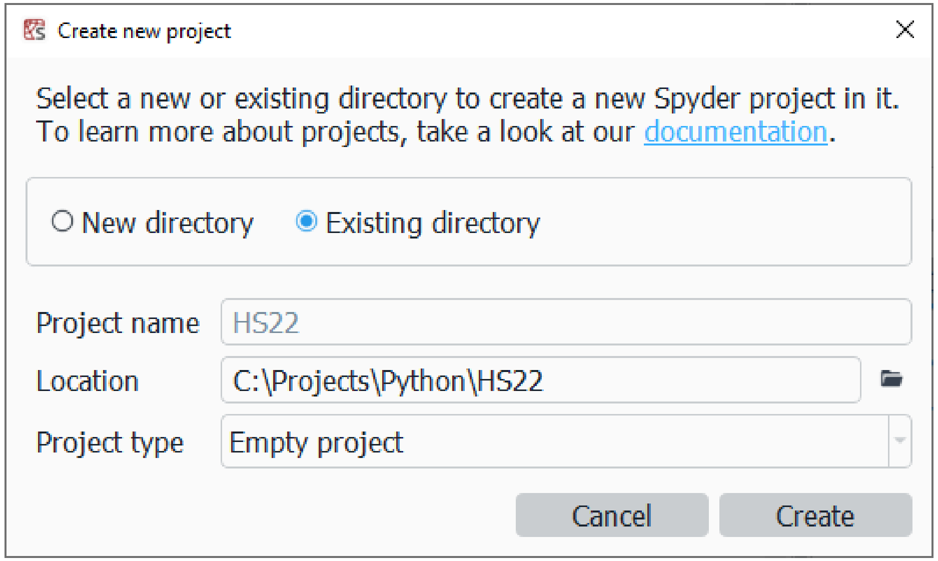
See if Miniconda is right for you.

System requirements

- License: Free use and redistribution under the terms of the EULA for Miniconda.
- Operating system: Windows 8 or newer, 64-bit macOS 10.13+, or Linux, including Ubuntu, RedHat, CentOS 7+, and others.
- If your operating system is older than what is currently supported, you can find older

Create a new Python project




Create new project

Select a new or existing directory to create a new Spyder project in it.
To learn more about projects, take a look at our documentation.

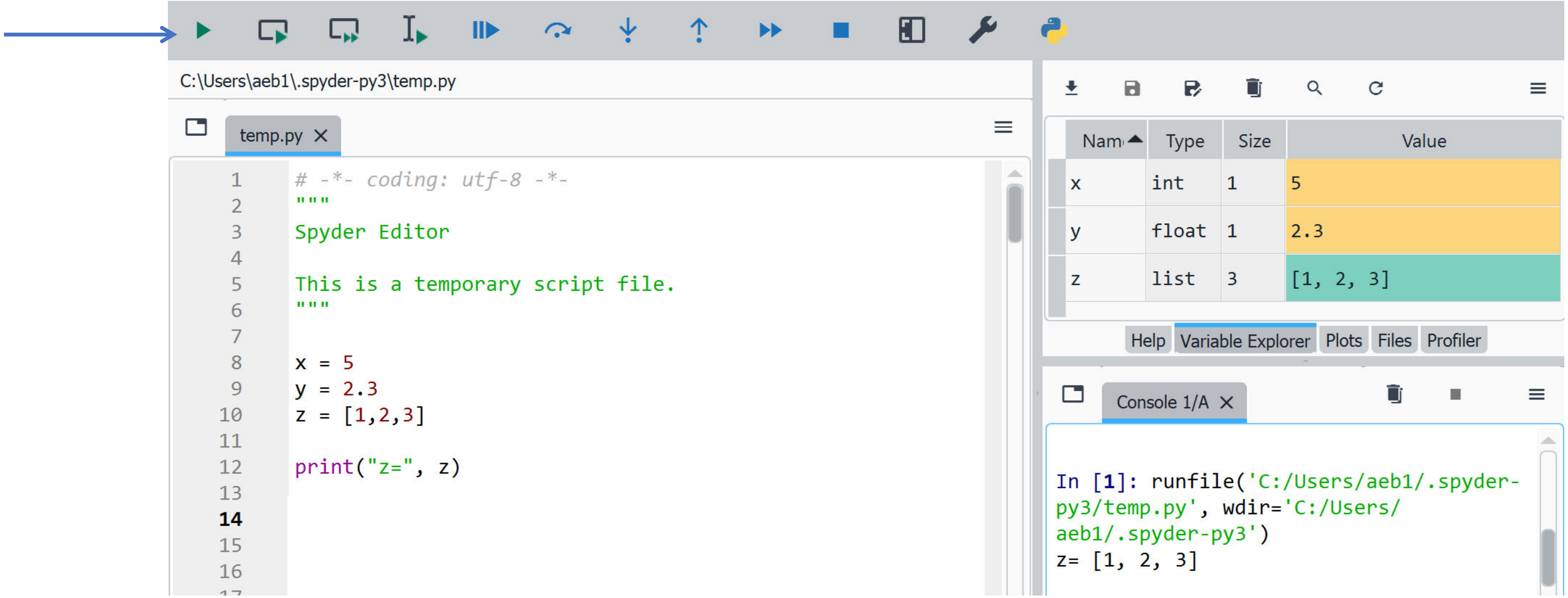
○ New directory ● Existing directory

Project name: HS22

Location: C:\Projects\Python\HS22

Project type: Empty project

Start Python Interpreter



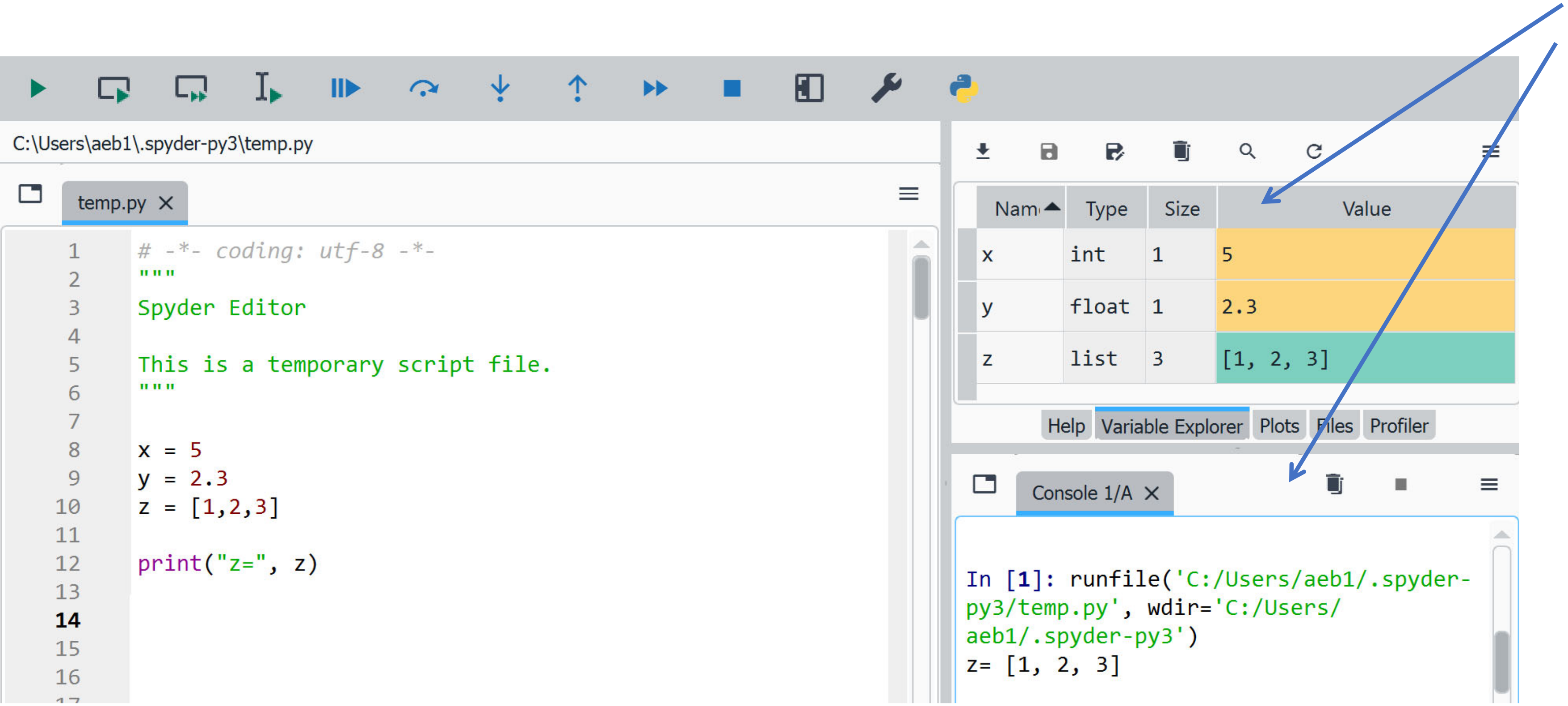
C:\Users\aeb1\.spyder-py3\temp.py

```
# -*- coding: utf-8 -*-
"""
Spyder Editor

This is a temporary script file.
"""


x = 5
y = 2.3
z = [1,2,3]

print("z=", z)
```

Name	Type	Size	Value
x	int	1	5
y	float	1	2.3
z	list	3	[1, 2, 3]

```
In [1]: runfile('C:/Users/aeb1/.spyder-py3/temp.py', wdir='C:/Users/aeb1/.spyder-py3')
z= [1, 2, 3]
```

Console / Variable Explorer



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