ntic master
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UNIVERSIDAD COMPLUTENSE DE MADRID

Programación. Python

Datos básicos

Cristóbal Pareja Flores

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

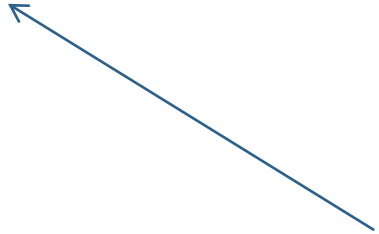
```
1  # -*- coding: utf-8 -*-
2
3
```

Nam | Type | Size | Value

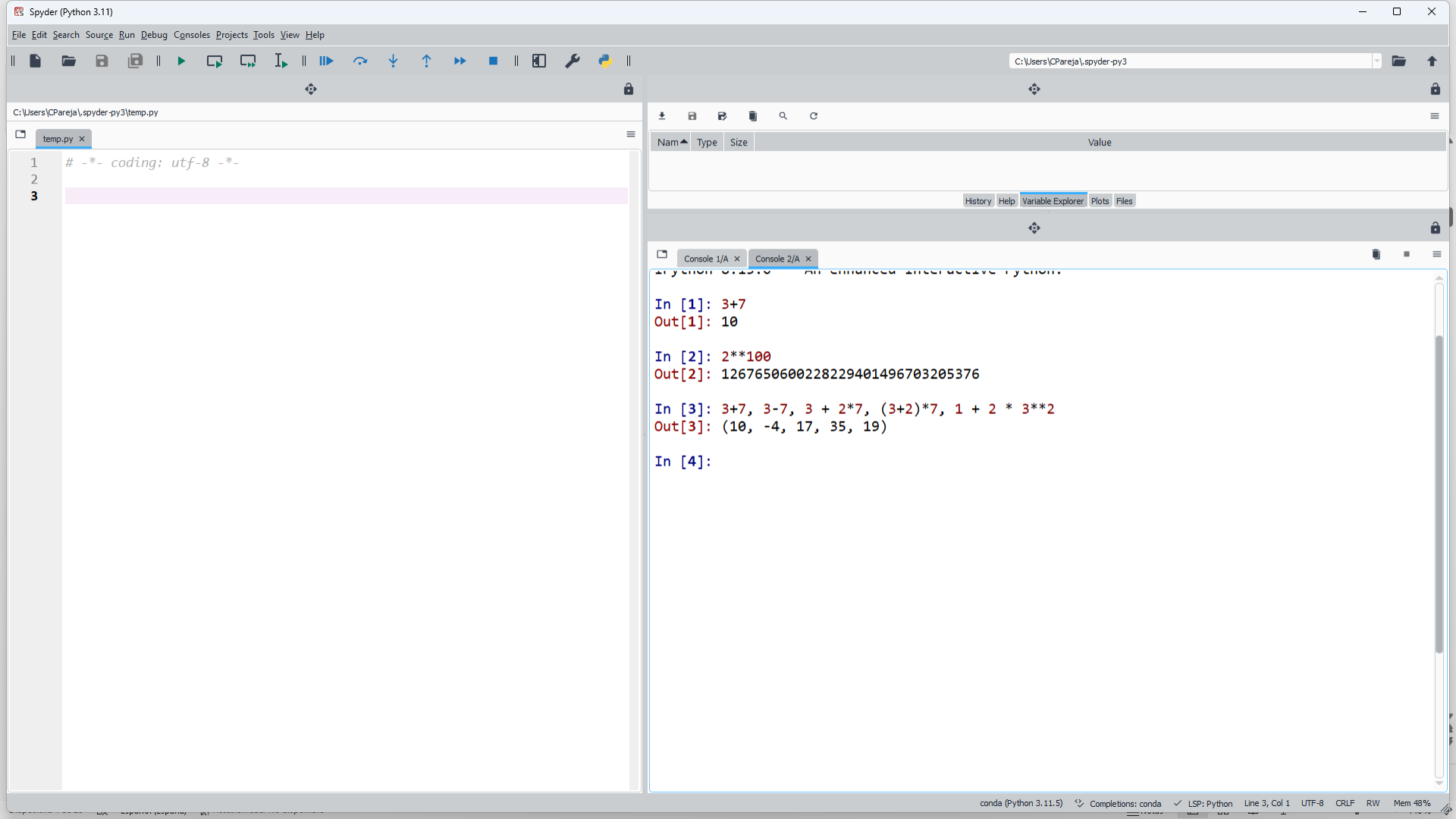
History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [1]:
```



conda (Python 3.11.5) Completions: conda LSP: Python Line 3, Col 1 UTF-8 CRLF RW Mem 49%


Spyder (Python 3.11)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\CPareja\.spyder-py3
C:\Users\CPareja\.spyder-py3\temp.py
temp.py
1 # -*- coding: utf-8 -*-
2
3
Nam Type Size Value
History Help Variable Explorer Plots Files
Console 1/A Console 2/A
In [1]: 3+7
Out[1]: 10
In [2]: 2**100
Out[2]: 1267650600228229401496703205376
In [3]: 3+7, 3-7, 3 + 2*7, (3+2)*7, 1 + 2 * 3**2
Out[3]: (10, -4, 17, 35, 19)
In [4]:
conda (Python 3.11.5) Completions: conda LSP: Python Line 3, Col 1 UTF-8 CRLF RW Mem 48%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

```
1  # -*- coding: utf-8 -*-
2
3
```

Nam | Type | Size | Value

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [1]: 3+7
Out[1]: 10

In [2]: 2**100
Out[2]: 1267650600228229401496703205376

In [3]: 3+7, 3-7, 3 + 2*7, (3+2)*7, 1 + 2 * 3**2
Out[3]: (10, -4, 17, 35, 19)

In [4]: 17/5
Out[4]: 3.4

In [5]: 17//5
Out[5]: 3

In [6]: 17%5
Out[6]: 2

In [7]: 17/5, 17//5, 17%5
Out[7]: (3.4, 3, 2)

In [8]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 3, Col 1 UTF-8 CRLF RW Mem 47%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

```
1  # -*- coding: utf-8 -*-
2
3
```

Name	Type	Size	Value
cociente	int	1	3
dividendo	int	1	17

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
Out[3]: (10, -4, 17, 35, 19)

In [4]: 17/5
Out[4]: 3.4

In [5]: 17//5
Out[5]: 3

In [6]: 17%5
Out[6]: 2

In [7]: 17/5, 17//5, 17%5
Out[7]: (3.4, 3, 2)

In [8]: dividendo = 17

In [9]: divisor = 5

In [10]: cociente = dividendo // divisor

In [11]: resto = dividendo % divisor

In [12]: dividendo, divisor, cociente, resto
Out[12]: (17, 5, 3, 2)

In [13]: dividendo == divisor * cociente + resto
Out[13]: True

In [14]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 3, Col 1 UTF-8 CRLF RW Mem 46%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

```
1  # -*- coding: utf-8 -*-
2
3
```

Name	Type	Size	Value
a	int	1	7
b	float	1	2.5

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [12]: dividendo, divisor, cociente, resto
Out[12]: (17, 5, 3, 2)

In [13]: dividendo == divisor * cociente + resto
Out[13]: True

In [14]: type(7), type(3.0), type(7 + 3.0)
Out[14]: (int, float, float)

In [15]: a, b, c = 7, 2.5, 7 == 2.5

In [16]: a, b, c
Out[16]: (7, 2.5, False)

In [17]: type(a), type(b), type(c)
Out[17]: (int, float, bool)

In [18]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 3, Col 1 UTF-8 CRLF RW Mem 46%

Spyder (Python 3.11)

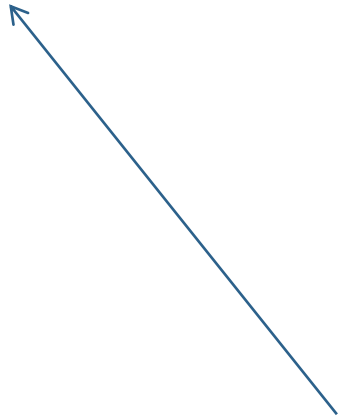
File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\CPareja\.spyder-py3

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

temp.py*

```
1  # -*- coding: utf-8 -*-
2
3  """
4  Algunas funciones básicas
5  """
6
7  def poli(x):
8      return 6 - 4*x + 3 *x**2
9
```



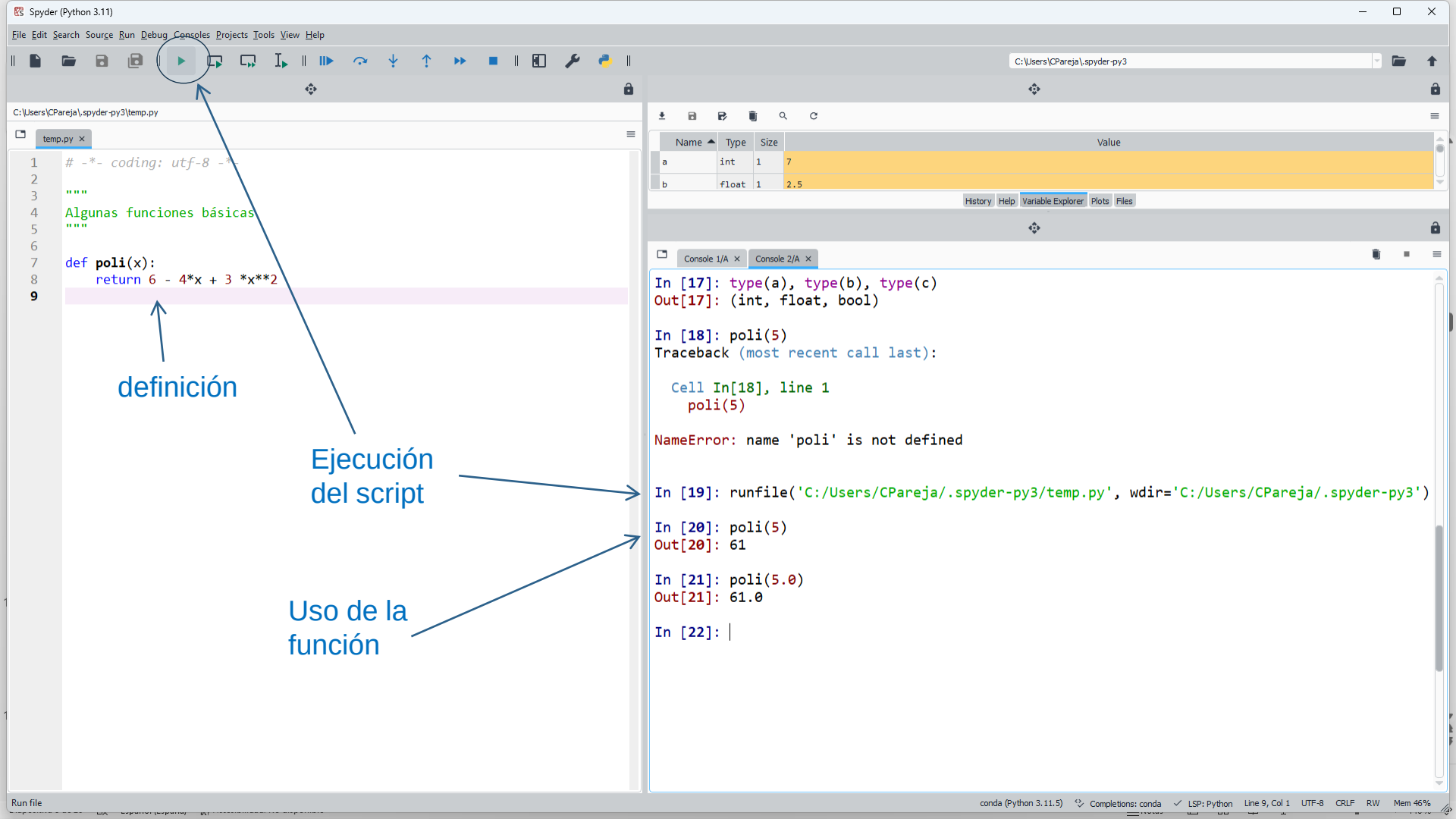
Name	Type	Size	Value
a	int	1	7
b	float	1	2.5

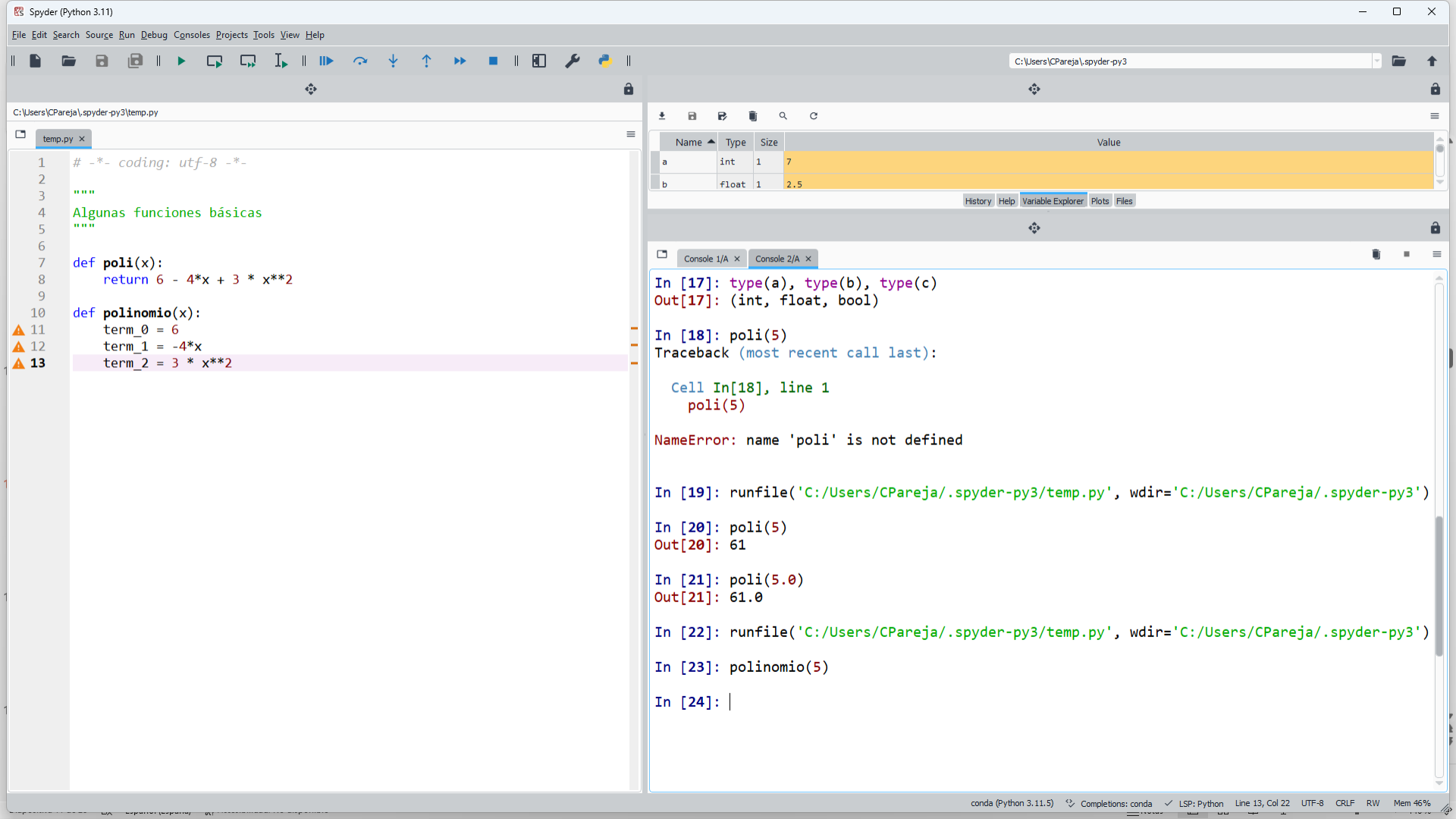
History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [17]: type(a), type(b), type(c)
Out[17]: (int, float, bool)

In [18]: poli(5)
Traceback (most recent call last):

  Cell In[18], line 1
    poli(5)

NameError: name 'poli' is not defined


In [19]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 9, Col 1 UTF-8 CRLF RW Mem 46%


Spyder (Python 3.11)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\CPareja\.spyder-py3
C:\Users\CPareja\.spyder-py3\temp.py
temp.py
1 # -*- coding: utf-8 -*-
2
3 """
4 Algunas funciones básicas
5 """
6
7 def poli(x):
8 return 6 - 4*x + 3 *x**2
9
Name Type Size Value
a int 1 7
b float 1 2.5
History Help Variable Explorer Plots Files
Console 1/A
Console 2/A
In [17]: type(a), type(b), type(c)
Out[17]: (int, float, bool)
In [18]: poli(5)
Traceback (most recent call last):
Cell In[18], line 1
poli(5)
NameError: name 'poli' is not defined
In [19]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')
In [20]: poli(5)
Out[20]: 61
In [21]: poli(5.0)
Out[21]: 61.0
In [22]:
definición
Ejecución del script
Uso de la función
Run file
conda (Python 3.11.5)
Completions: conda
LSP: Python
Line 9, Col 1
UTF-8
CRLF
RW
Mem 46%


Spyder (Python 3.11)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\CPareja\.spyder-py3
C:\Users\CPareja\.spyder-py3\temp.py
temp.py
-*- coding: utf-8 -*-
"""
Algunas funciones básicas
"""
def poli(x):
return 6 - 4*x + 3 * x**2
def polinomio(x):
term_0 = 6
term_1 = -4*x
term_2 = 3 * x**2
Name Type Size Value
a int 1 7
b float 1 2.5
History Help Variable Explorer Plots Files
Console 1/A
Console 2/A
In [17]: type(a), type(b), type(c)
Out[17]: (int, float, bool)
In [18]: poli(5)
Traceback (most recent call last):
Cell In[18], line 1
poli(5)
NameError: name 'poli' is not defined
In [19]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')
In [20]: poli(5)
Out[20]: 61
In [21]: poli(5.0)
Out[21]: 61.0
In [22]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')
In [23]: polinomio(5)
In [24]:
conda (Python 3.11.5) Completions: conda LSP: Python Line 13, Col 22 UTF-8 CRLF RW Mem 46%

Spyder (Python 3.11)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\CPareja\.spyder-py3

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

temp.py

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

"""
Algunas funciones básicas
"""

def poli(x):
    return 6 - 4*x + 3 * x**2

def polinomio(x):
    term_0 = 6
    term_1 = -4*x
    term_2 = 3 * x**2
    return term_0 + term_1 + term_2
```

Name	Type	Size	Value
a	int	1	7
b	float	1	2.5

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [17]: type(a), type(b), type(c)
Out[17]: (int, float, bool)

In [18]: poli(5)
Traceback (most recent call last):

  Cell In[18], line 1
    poli(5)

NameError: name 'poli' is not defined


In [19]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')

In [20]: poli(5)
Out[20]: 61

In [21]: poli(5.0)
Out[21]: 61.0

In [22]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')

In [23]: polinomio(5)

In [24]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')

In [25]: polinomio(5)
Out[25]: 61

In [26]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 14, Col 36 UTF-8 CRLF RW Mem 46%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

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

"""
Algunas funciones básicas
"""

def poli(x):
    return 6 - 4*x + 3 * x**2

def polinomio(x):
    term_0 = 6
    term_1 = -4*x
    term_2 = 3 * x**2
    return term_0 + term_1 + term_2
```

Name	Type	Size	Value
a	int	1	4
b	int	1	7

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [23]: polinomio(5)

In [24]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')

In [25]: polinomio(5)
Out[25]: 61

In [26]: a, b = 7, 4

In [27]: a, b = b, a

In [28]: a, b
Out[28]: (4, 7)

In [29]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 14, Col 36 UTF-8 CRLF RW Mem 47%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

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

"""
Algunas funciones básicas
"""

def poli(x):
    return 6 - 4*x + 3 * x**2

def polinomio(x):
    term_0 = 6
    term_1 = -4*x
    term_2 = 3 * x**2
    return term_0 + term_1 + term_2
```

Name	Type	Size	Value
a	int	1	4
b	int	1	7

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [1]: int(3.9), int(-3.9)
Out[1]: (3, -3)

In [2]: round(3.9), round(3.4), round(-3.9), round(-3.4)
Out[2]: (4, 3, -4, -3)

In [3]: floor(3.9)
Traceback (most recent call last):

  Cell In[3], line 1
    floor(3.9)

NameError: name 'floor' is not defined


In [4]: import math

In [5]: math.floor(3.9), math.floor(-3.9)
Out[5]: (3, -4)

In [6]: math.ceil(3.9), math.ceil(-3.9)
Out[6]: (4, -3)

In [7]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 14, Col 36 UTF-8 CRLF RW Mem 47%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

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

"""
Algunas funciones básicas
"""

def poli(x):
    return 6 - 4*x + 3 * x**2

def polinomio(x):
    term_0 = 6
    term_1 = -4*x
    term_2 = 3 * x**2
    return term_0 + term_1 + term_2
```

Name	Type	Size	Value
a	int	1	4
b	int	1	7

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [7]: z = complex(2, 3)

In [8]: z
Out[8]: (2+3j)

In [9]: z + 4
Out[9]: (6+3j)

In [10]: z**2
Out[10]: (-5+12j)

In [11]: z.real, z.imag
Out[11]: (2.0, 3.0)

In [12]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 14, Col 36 UTF-8 CRLF RW Mem 47%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

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

"""
Algunas funciones básicas
"""

def poli(x):
    return 6 - 4*x + 3 * x**2

def polinomio(x):
    term_0 = 6
    term_1 = -4*x
    term_2 = 3 * x**2
    return term_0 + term_1 + term_2
```

Name	Type	Size	Value
a	int	1	4
b	int	1	7

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [41]: sqrt(4)
Traceback (most recent call last):

  Cell In[41], line 1
    sqrt(4)

NameError: name 'sqrt' is not defined


In [42]: math.sqrt(4)
Out[42]: 2.0

In [43]: math.sqrt(-1)
Traceback (most recent call last):

  Cell In[43], line 1
    math.sqrt(-1)

ValueError: math domain error


In [44]: import cmath

In [45]: cmath.sqrt(-1)
Out[45]: 1j

In [46]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 14, Col 36 UTF-8 CRLF RW Mem 49%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

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

"""
Algunas funciones básicas
"""

def poli(x):
    return 6 - 4*x + 3 * x**2

def polinomio(x):
    term_0 = 6
    term_1 = -4*x
    term_2 = 3 * x**2
    return term_0 + term_1 + term_2
```

Name	Type	Size	Value
a	bool	1	False
b	bool	1	True

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [46]: a, b = True, False

In [47]: a and b, a or b
Out[47]: (False, True)

In [48]: not (a and b) or False
Out[48]: True

In [49]: a, b
Out[49]: (True, False)

In [50]: a, b = not a, not b

In [51]: a, b
Out[51]: (False, True)

In [52]: 2 == 4
Out[52]: False

In [53]: 2 != 4
Out[53]: True

In [54]: 2 < 4, 2 <= 4, 2 > 4, 2 >= 4
Out[54]: (True, True, False, False)

In [55]: 2 < 4 and 4 < 10, 2 < 4 < 10
Out[55]: (True, True)

In [56]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 14, Col 36 UTF-8 CRLF RW Mem 47%

Spyder (Python 3.11)

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C:\Users\CPareja\.spyder-py3

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

temp.py

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

"""
Algunas funciones básicas
"""

def poli(x):
    return 6 - 4*x + 3 * x**2

def polinomio(x):
    term_0 = 6
    term_1 = -4*x
    term_2 = 3 * x**2
    return term_0 + term_1 + term_2
```

Name	Type	Size	Value
a	str	4	Hola
b	str	4	Hola

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [58]: a, b = "Hola", 'Hola'

In [59]: a, b
Out[59]: ('Hola', 'Hola')

In [60]: n = "Cris"

In [61]: a+n
Out[61]: 'HolaCris'

In [62]: a + " " + n
Out[62]: 'Hola Cris'

In [63]: a * 10
Out[63]: 'HolaHolaHolaHolaHolaHolaHolaHolaHolaHola'

In [64]: (a + " ")* 10
Out[64]: 'Hola Hola Hola Hola Hola Hola Hola Hola Hola Hola '

In [65]: "Hola" == "Hola", "Hola" < "Hola", "Hola" > "Hola", "Hola" <= "Hola"
Out[65]: (True, False, False, True)

In [66]: "Hola" == "hola"
Out[66]: False

In [67]: len("Hola")
Out[67]: 4

In [68]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 14, Col 36 UTF-8 CRLF RW Mem 47%

Spyder (Python 3.11)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\CPareja\.spyder-py3

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

temp.py

```
1  # -*- coding: utf-8 -*-
2
3  """
4  Algunas funciones básicas
5  """
6
7  def poli(x):
8      return 6 - 4*x + 3 * x**2
9
10 def polinomio(x):
11     term_0 = 6
12     term_1 = -4*x
13     term_2 = 3 * x**2
14     return term_0 + term_1 + term_2
15
16 cien_annos = """Muchos años después,
17 frente al pelotón de fusilamiento, el coronel Aureliano Buendía
18 había de recordar aquella tarde remota en que su padre
19 lo llevó a conocer el hielo. Macondo era entonces una aldea de
20 veinte casas de barro y cañabrava construidas a la orilla de un río de
21 aguas diáfanas que se precipitaban por un lecho de piedras pulidas,
22 blancas y enormes como huevos prehistóricos. El mundo era tan
23 reciente, que muchas cosas carecían de nombre, y para mencionarlas
24 había que señalarlas con el dedo."""
```

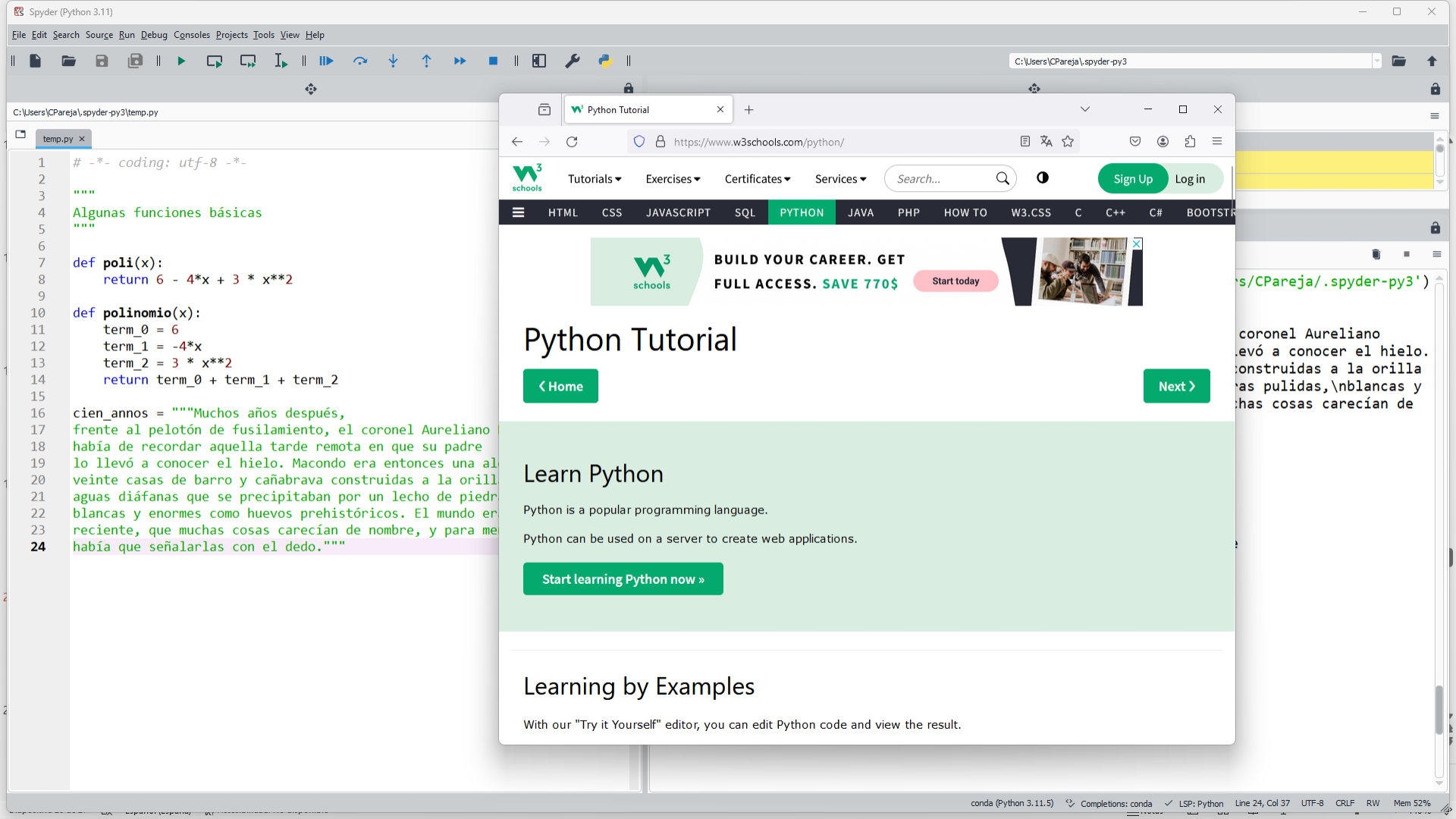
Name	Type	Size	Value
a	str	4	Hola
b	str	4	Hola

History Help Variable Explorer Plots Files

Console 1/A Console 2/A

```
In [72]: runfile('C:/Users/CPareja/.spyder-py3/temp.py', wdir='C:/Users/CPareja/.spyder-py3')

In [73]: cien_annos
Out[73]: 'Muchos años después,\nfrente al pelotón de fusilamiento, el coronel Aureliano
Buendía\nhabía de recordar aquella tarde remota en que su padre\nlo llevó a conocer el hielo.
Macondo era entonces una aldea de\nveinte casas de barro y cañabrava construidas a la orilla
de un río de\naguas diáfanas que se precipitaban por un lecho de piedras pulidas,\nblancas y
enormes como huevos prehistóricos. El mundo era tan\nreciente, que muchas cosas carecían de
nombre, y para mencionarlas\nhabía que señalarlas con el dedo.'

In [74]: print(cien_annos)
Muchos años después,
frente al pelotón de fusilamiento, el coronel Aureliano Buendía
había de recordar aquella tarde remota en que su padre
lo llevó a conocer el hielo. Macondo era entonces una aldea de
veinte casas de barro y cañabrava construidas a la orilla de un río de
aguas diáfanas que se precipitaban por un lecho de piedras pulidas,
blancas y enormes como huevos prehistóricos. El mundo era tan
reciente, que muchas cosas carecían de nombre, y para mencionarlas
había que señalarlas con el dedo.

In [75]: len(cien_annos)
Out[75]: 504

In [76]:
```

conda (Python 3.11.5) Completions: conda LSP: Python Line 24, Col 37 UTF-8 CRLF RW Mem 53%


Spyder (Python 3.11)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\CPareja\.spyder-py3
C:\Users\CPareja\.spyder-py3\temp.py
temp.py
-*- coding: utf-8 -*-
"""
Algunas funciones básicas
"""
def poli(x):
return 6 - 4*x + 3 * x**2
def polinomio(x):
term_0 = 6
term_1 = -4*x
term_2 = 3 * x**2
return term_0 + term_1 + term_2
cien_annos = """Muchos años después,
frente al pelotón de fusilamiento, el coronel Aureliano
había de recordar aquella tarde remota en que su padre
lo llevó a conocer el hielo. Macondo era entonces una al
veinte casas de barro y cañabrava construidas a la orill
aguas diáfanas que se precipitaban por un lecho de piedr
blancas y enormes como huevos prehistóricos. El mundo er
reciente, que muchas cosas carecían de nombre, y para me
había que señalarlas con el dedo."""
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Cristóbal Pareja Flores