Descripció

Comencem a familiaritzar-nos amb Python mitjançant l'entorn de treball "Jupyter Notebook" !!! Comencem amb uns quants exercicis bàsics

Nivell 1

Exercici 1

Instal·la el programa Anaconda amb Python 3, i Jupyter Notebook.

Exercici 2

Utilitzant Jupyter Notebook executa alguns càlculs senzills, a la vegada que et familiaritzes amb el llenguatge Markdown.

Crear variables

In [22]:
```
# declarar variables
x = 2
y = 5
xy = 'Hey'
print x+y, xy
```

```
  File "<ipython-input-22-4e45cf5fffd4>", line 5
    print x+y, xy
          ^
SyntaxError: Missing parentheses in call to 'print'. Did you mean print(x+y, xy)?
```

In [ ]:
```
# assignar diverses variables amb el mateix valor.
x = y = 1
print x,y
```

Operaciones matemáticas

Operadores aritméticos

Símbol	Tasca realitzada
+	Adición
-	Resta
/	División
%	Módulo
*	Multiplicación
//	División piso
**	Potenciación

In [ ]:
```
x = 2+3
print(x)
```

In [ ]:
```
x = 2-1
print(x)
```

In [ ]:
```
x = 1*2
print(x)
```

In [ ]:
```
# Si tanto el numerador como el denominador son números enteros, pero el resultado es
x = 1/2
print(x)
```

In [ ]:
```
#Para obtener la respuesta correcta debemos cambiar el numerador o el denominador a ti
x = 1/2.0
print(x)
```

In [ ]:
```
x = 15%10
print(x)
```

In [ ]:
```
x = 2.8//2.0
print(x)
```

Operadores relacionales

Operador	Descripción
==	Devuelve `True` si ambos operandos son iguales
!=	Devuelve `True` si ambos operandos no son iguales
<	Devuelve `True` si el operador de la derecha es mayor que el operador de la izquierda
>	Devuelve `True` si el operador de la izquierda es mayor que el operador de la derecha
<=	Devuelve `True` si el operador de la derecha es mayor o igual que el operador de la izquierda
>=	Devuelve `True` si el operador de la izquierda es mayor o igual que el operador de la derecha

In [ ]:
```
12 == 3  #False
```

In [ ]:
```
12 != 3  #True
```

In [23]:
```
12 < 3 #False
```

Out[23]: False

In [24]:
```
12 > 3 #True
```

Out[24]: True

In [25]:
```
12 >= 3 #True
```

Out[25]: True

In [26]:
```
12 <= 3 #False
```

Out[26]: False

Transforma con casting

Tipos Fundamentales

1. int
2. str
3. float
4. boolOperadores
5. complex

In [27]:
```
type(1)
```

Out[27]: int

In [28]:
```
type('hello')
```

Out[28]: str

In [29]:
```
type(2.5)
```

Out[29]: float

In [30]:
```
type(True)
```

Out[30]: bool

In [31]:
```
x = 1.0 - 1.0j
type(x)
```

Out[31]: complex

In [32]:
```
print(x.real, x.imag)
```

```
1.0 -1.0
```

Type casting

In [33]:
```
x = 1.5
print(x, type(x))
```

```
1.5 <class 'float'>
```

In [34]:
```
x = int(x)
print(x, type(x))
```

```
1 <class 'int'>
```

In [35]:
```
z = complex(x)
print(z, type(z))
```

```
(1+0j) <class 'complex'>
```

In [36]:
```
x = float(z)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-36-19c840f40bd8> in <module>
----> 1 x = float(z)

TypeError: can't convert complex to float
```

Las variables complejas no se pueden convertir en números flotantes o enteros. Necesitamos usar z.real o z.imag para extraer la parte del número complejo que queremos:

In [ ]:
```
y = bool(z.real)
print(z.real, " -> ", y, type(y))

y = bool(z.imag)
print(z.imag, " -> ", y, type(y))
```

Técnicas con Strings

Strings

Las cadenas son el tipo de variable que se utiliza para almacenar mensajes de texto.

In [ ]:
```
s = "Hello world"
type(s)
```

In [ ]:
```
# reemplazar una subcadena en una cadena con algo más
s2 = s.replace("world", "test")
print(s2)
```

In [ ]:
```
# podemos indexar un carácter en una cadena usando []:
s[0]
```

In [ ]:
```
s[0:5]
```

Si omitimos uno (o ambos) de start o stop desde `[start:stop]`, el valor predeterminado es el principio y el final de la cadena, respectivamente:

In [ ]:
```
s[:5]
```

In [ ]:
```
s[6:]
```

También podemos definir el tamaño del paso usando la sintaxis `[start:end:step]`

In [ ]:
```
s[::1]
```

In [ ]:
```
s[::2]
```

String formatting

In [ ]:
```

# podemos usar formato de cadena de estilo C
# este formato crea una cadena
# forma alternativa y más intuitiva de formatear una cadena
```

In [ ]:
```
print("str1", "str2", "str3")  # La declaración de impresión concatena cadenas con un
```

In [37]:
```
print("str1", 1.0, False, -1j)  # Las declaraciones de impresión convierten todos los
```

```
str1 1.0 False (-0-1j)
```

In [38]:
```
print("str1" + "str2" + "str3") # cadenas agregadas con + se concatenan sin espacio
```

```
str1str2str3
```

In [39]:
```
print("value = %f" % 1.0)       # podemos usar formato de cadena de estilo C
```

```
value = 1.000000
```

In [40]:
```
# este formato crea una cadena
s2 = "value1 = %.2f. value2 = %d" % (3.1415, 1.5)
print(s2)
```

```
value1 = 3.14. value2 = 1
```

In [41]:
```
# forma alternativa y más intuitiva de formatear una cadena
s3 = 'value1 = {0}, value2 = {1}'.format(3.1415, 1.5)
print(s3)
```

```
value1 = 3.1415, value2 = 1.5
```

Booleanos

- Los operadores booleanos se escriben como las palabras `and`, `not`, `or`.

Operador	Uso	Descripción
and	a and b	Devuelve `True` si ambos operandos son **True**
or	a or b	Devuelve `True` si alguno de los operandos es **True**
not	not a	Devuelve `True` si alguno de los operandos **False**

In [42]:
```
a = True
b = False
print(a and b) #False
```

```
False
```

In [43]:
```
print(a or b) #True
```

```
True
```

In [44]:
```
print(not a) #False
print(not b) #True
```

```
False
True
```

Exercici 3

Prova de crear títols, llistes, canviar l'estil de la lletra o afegir imatges dins del Notebook.

Títulos, listas y cambios del estilo de letra fuero realizados en los ejercicios anteriores

In [45]:
```
from IPython import display
display.Image("./jupyMark.png")
```

Out[45]:

Nivell 2

Exercici 1

Exporta el Notebook com a pdf i com a html.

Nivell 3

Exercici 1

Instal·la Nbextensions al Notebook de Jupyter.

In [46]:
```
!pip install nbconvert[webpdf]
```

```
Requirement already satisfied: nbconvert[webpdf] in /home/leo/.local/lib/python3.8/site-packages (6.0.7)
Requirement already satisfied: jupyter-core in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (4.7.1)
Requirement already satisfied: defusedxml in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (0.6.0)
Requirement already satisfied: pandocfilters>=1.4.1 in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (1.4.3)
Requirement already satisfied: traitlets>=4.2 in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (5.0.5)
Requirement already satisfied: testpath in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (0.4.4)
Requirement already satisfied: entrypoints>=0.2.2 in /home/leo/anaconda3/lib/python3.8/site-packages (from nbconvert[webpdf]) (0.3)
Requirement already satisfied: nbclient<0.6.0,>=0.5.0 in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (0.5.2)
Requirement already satisfied: mistune<2,>=0.8.1 in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (0.8.4)
Requirement already satisfied: jupyterlab-pygments in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (0.1.2)
Requirement already satisfied: bleach in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (3.3.0)
Requirement already satisfied: nbformat>=4.4 in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (5.1.2)
Requirement already satisfied: pygments>=2.4.1 in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (2.8.0)
Requirement already satisfied: jinja2>=2.4 in /home/leo/.local/lib/python3.8/site-packages (from nbconvert[webpdf]) (2.11.3)
Requirement already satisfied: pyppeteer==0.2.2 in /home/leo/anaconda3/lib/python3.8/site-packages (from nbconvert[webpdf]) (0.2.2)
Requirement already satisfied: websockets<9.0,>=8.1 in /home/leo/anaconda3/lib/python3.8/site-packages (from pyppeteer==0.2.2->nbconvert[webpdf]) (8.1)
Requirement already satisfied: tqdm<5.0.0,>=4.42.1 in /home/leo/anaconda3/lib/python3.8/site-packages (from pyppeteer==0.2.2->nbconvert[webpdf]) (4.59.0)
Requirement already satisfied: pyee<8.0.0,>=7.0.1 in /home/leo/anaconda3/lib/python3.8/site-packages (from pyppeteer==0.2.2->nbconvert[webpdf]) (7.0.4)
Requirement already satisfied: urllib3<2.0.0,>=1.25.8 in /home/leo/anaconda3/lib/python3.8/site-packages (from pyppeteer==0.2.2->nbconvert[webpdf]) (1.26.4)
Requirement already satisfied: appdirs<2.0.0,>=1.4.3 in /home/leo/anaconda3/lib/python3.8/site-packages (from pyppeteer==0.2.2->nbconvert[webpdf]) (1.4.4)
Requirement already satisfied: MarkupSafe>=0.23 in /home/leo/anaconda3/lib/python3.8/site-packages (from jinja2>=2.4->nbconvert[webpdf]) (1.1.1)
Requirement already satisfied: jupyter-client>=6.1.5 in /home/leo/.local/lib/python3.8/site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert[webpdf]) (6.1.11)
Requirement already satisfied: nest-asyncio in /home/leo/.local/lib/python3.8/site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert[webpdf]) (1.5.1)
Requirement already satisfied: async-generator in /home/leo/.local/lib/python3.8/site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert[webpdf]) (1.10)
Requirement already satisfied: tornado>=4.1 in /home/leo/.local/lib/python3.8/site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert[webpdf]) (6.1)
Requirement already satisfied: pyzmq>=13 in /home/leo/.local/lib/python3.8/site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert[webpdf]) (22.0.3)
Requirement already satisfied: python-dateutil>=2.1 in /home/leo/anaconda3/lib/python3.8/site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert[webpdf]) (2.8.1)
Requirement already satisfied: ipython-genutils in /home/leo/.local/lib/python3.8/site-packages (from nbformat>=4.4->nbconvert[webpdf]) (0.2.0)
Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in /home/leo/.local/lib/python3.8/site-packages (from nbformat>=4.4->nbconvert[webpdf]) (3.2.0)
Requirement already satisfied: setuptools in /home/leo/anaconda3/lib/python3.8/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert[webpdf]) (52.0.0.post20210125)
Requirement already satisfied: pyrsistent>=0.14.0 in /home/leo/.local/lib/python3.8/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert[webpdf]) (0.17.3)
Requirement already satisfied: six>=1.11.0 in /home/leo/anaconda3/lib/python3.8/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert[webpdf]) (1.15.0)
Requirement already satisfied: attrs>=17.4.0 in /home/leo/.local/lib/python3.8/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert[webpdf]) (20.3.0)
Requirement already satisfied: webencodings in /home/leo/.local/lib/python3.8/site-packages (from bleach->nbconvert[webpdf]) (0.5.1)
Requirement already satisfied: packaging in /home/leo/.local/lib/python3.8/site-packages (from bleach->nbconvert[webpdf]) (20.9)
Requirement already satisfied: pyparsing>=2.0.2 in /home/leo/.local/lib/python3.8/site-packages (from packaging->bleach->nbconvert[webpdf]) (2.4.7)
```