



LABORATORIO DI:

METODI E MODELLI MATEMATICI IN PYTHON

A CURA DI: **ANTONIO MIRARCHI & GIUSEPPE TROTTA**

<https://www.labmetodiemodelli.it/>

IL PROGRAMMA

INTRODUZIONE A
PYTHON

01

LE STRUTTURE
DATI IN
PYTHON

02

LE LIBRERIE PER LA
DATA SCIENCE
(PARTE 2)
+ Test Intermedio

04

LE LIBRERIE PER LA
DATA SCIENCE
(PARTE 1)

03

LA DATA ANALYSIS
E LA DATA
VISUALIZATION

05

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<https://www.labmetodiemodelli.it/>

IL PROGRAMMA

COSTRUIRE MODELLI
PREDITTIVI (PARTE 1)



COSTRUIRE MODELLI
PREDITTIVI (PARTE 2) +
Test Intermedio



COSTRUIRE MODELLI
PREDITTIVI (PARTE 4)



COSTRUIRE MODELLI
PREDITTIVI (PARTE 3)



RETI NEURALI &
DEEP LEARNING
+ Test Intermedio

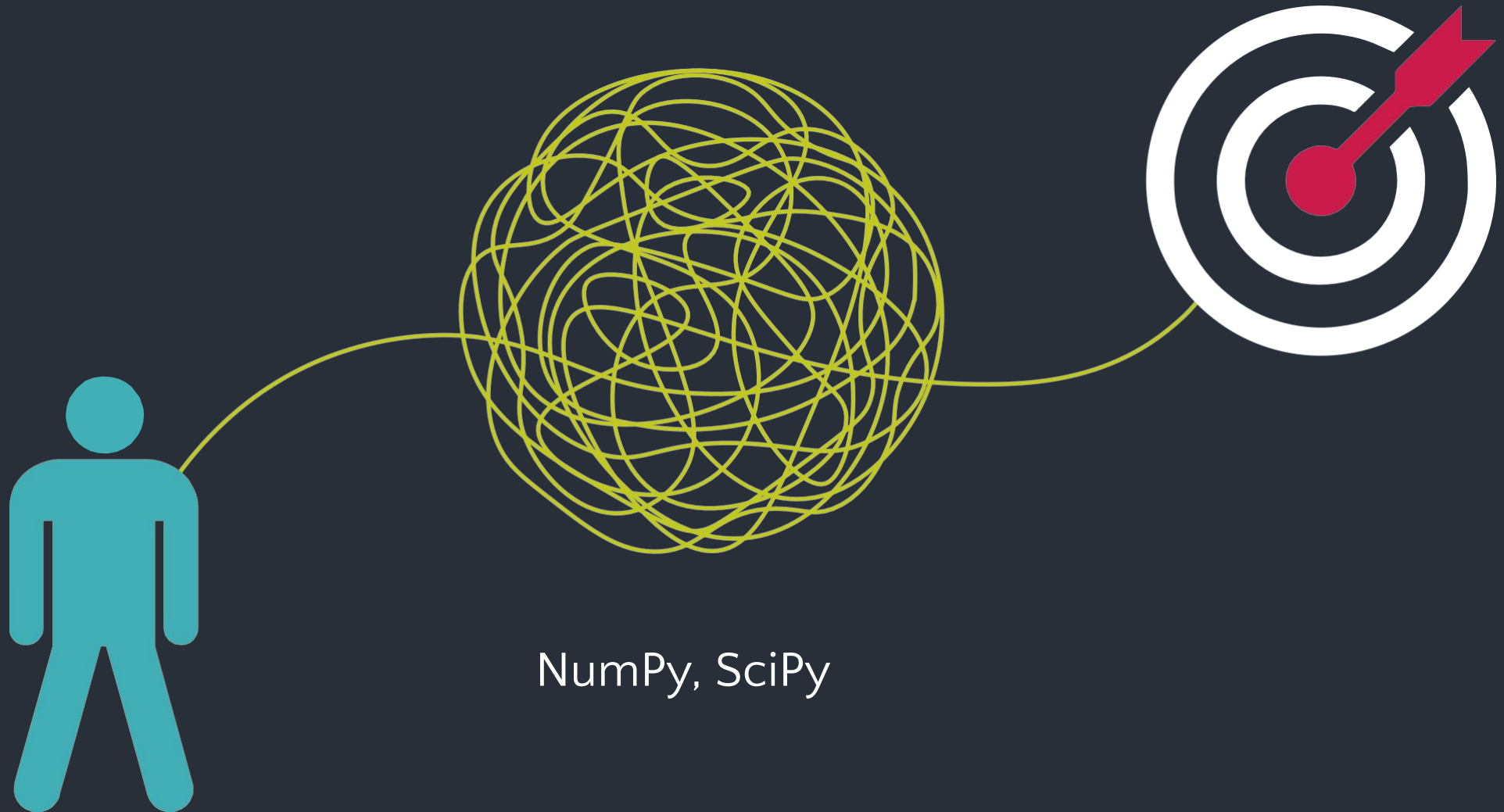




Let's Code!

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Dove eravamo rimasti?





Let's Code!

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1

DataFrame e Series

2

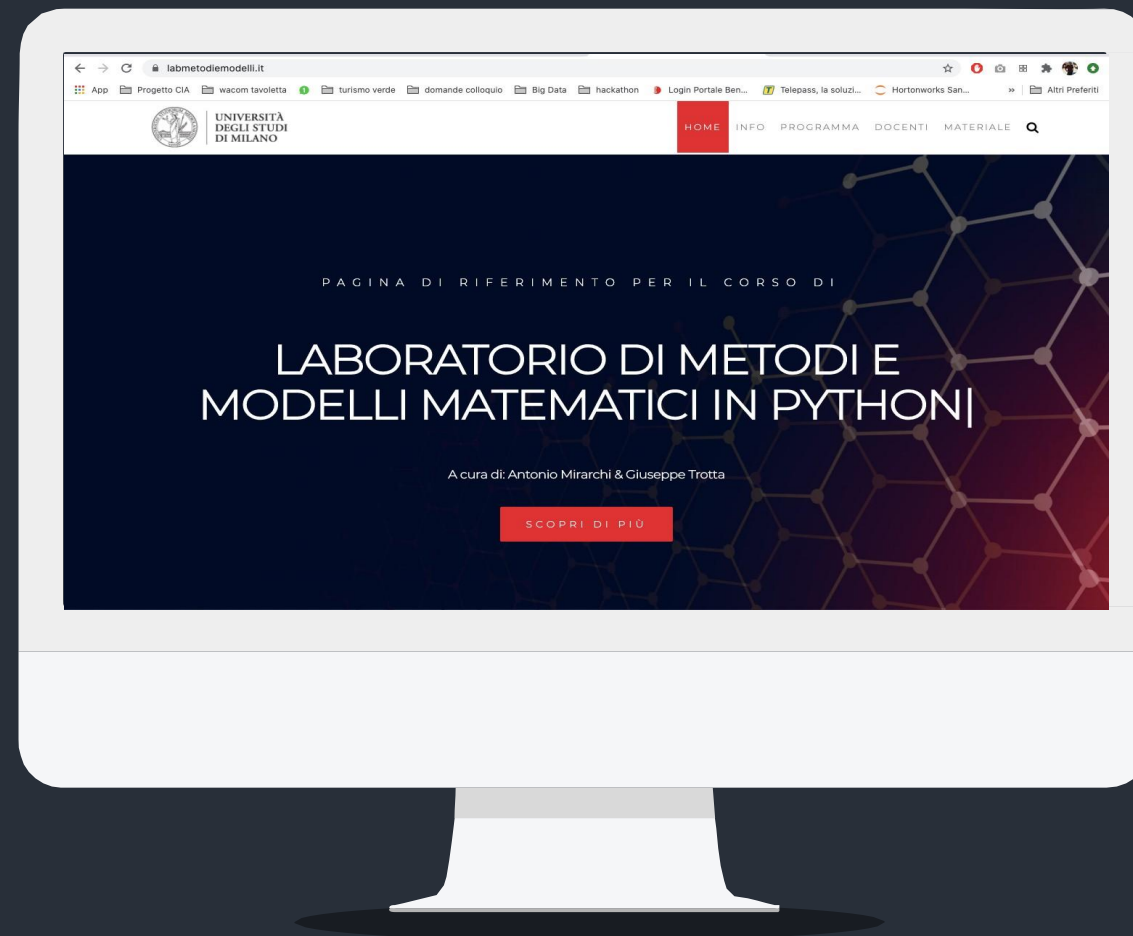
Creare un DataFrame con Pandas

3

Manipolare i DataFrame

4

Matplotlib



Pandas is a Python package for data science, it offers powerful, expressive and flexible data structures that make data manipulation and analysis easy, among many other things.

Pandas Series: a one-dimensional labeled array capable of holding any data type with axis labels or index.

DataFrames: they come with the Pandas library, and they are defined as two-dimensional labeled data structures with columns of potentially different types.

In general, you could say that the Pandas DataFrame consists of three main components: the data, the index, and the columns.

Create a Series from a Python List

```
lista = ['A','B','C','D']  
series = pd.Series(data=lista)  
series
```

1 A

2 B

3 C

4 D

dtype: object

Manipulate the index

```
lista = ['A','B','C','D']  
lista2 = [10,20,30,40]  
series = pd.Series(data=lista, index=lista2)  
series
```

10 A

20 B

30 C

40 D

dtype: object

Create a DataFrame from a numpy matrix

```
a = np.random.randn(5,4)
df = pd.DataFrame (a, index= ['A','B', 'C','D','E'], columns=['W','X','Y','Z'])
df
```

Add Row & Columns

```
frutti = ['Anguria', 'Pompelmo', 'Fragole', 'Nespole', 'Lamponi', 'Pesca',  
'Melone', 'More']  
calorie = [16, 26, 27, 28, 34, 27, 33, 36]  
colore = ['rosso', 'rosa', 'rosso', 'arancione', 'rosso', 'arancione',  
'arancione', 'nero']  
df = pd.DataFrame (frutti, columns=['Frutto'])  
df['Calorie'] = calorie  
df['Colore'] = colore  
df
```

Remove Rows and Columns

```
df.drop ('Frutto',axis=1) #elimina la colonna  
df.drop (3, axis=0) #elimina la riga con indice 3  
df
```

Select Columns and Rows

```
#selezionare 1 colonna sola  
df['Calorie']
```

```
#selezionare più colonne  
df[['Calorie','Colore', 'Frutto']]
```

```
#selezionare la riga  
#df.iloc['index']  
df.iloc[6]
```

Conditional selection

#selezione condizionata

```
df['Calorie'] < 27
```

```
df[df['Calorie'] < 27 ]
```

```
df[df['Colore'] == 'rosso']
```

```
df[(df['Colore'] == 'rosso') | (df['Colore'] == 'arancione')]
```

Dataframe Info

```
df['Colore'].unique()  
df['Colore'].value_counts()  
df.head()  
df.head(10)  
df.tail()  
df.tail(10)  
df.info()
```

Data Cleaning

```
s = pd.Series([1,4,np.nan,2,None,5,6,8,])  
s.isnull()  
s[s.isnull()]  
s.notnull()  
s[s.notnull()]  
s.dropna()  
s.fillna(0.0000)  
s.fillna(method='ffill') #per i valori precedenti  
s.fillna(method='bfill') #per i valori successivi
```



Import da Fonti Esterne

```
df = pd.read_excel('nome file')
```

```
df =  
pd.read_html('https://en.wikipedia.org/wiki/List_of_Presidents_of_the_United_States')
```

```
df = pd.read_csv('data.csv')
```



Let's Code!

Prossimi Appuntamenti

19

NOV

Costruire Modelli Predittivi – P1

26

NOV

Costruire Modelli Predittivi – P2 +
Test Intermedio

03

DIC

Costruire Modelli Predittivi – P3