

# Corso ITS: *ARTIFICIAL INTELLIGENCE SPECIALIST*

## Modulo: Programmazione ad oggetti in Python e librerie esterne

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**Giovedì 20 Marzo 2025**

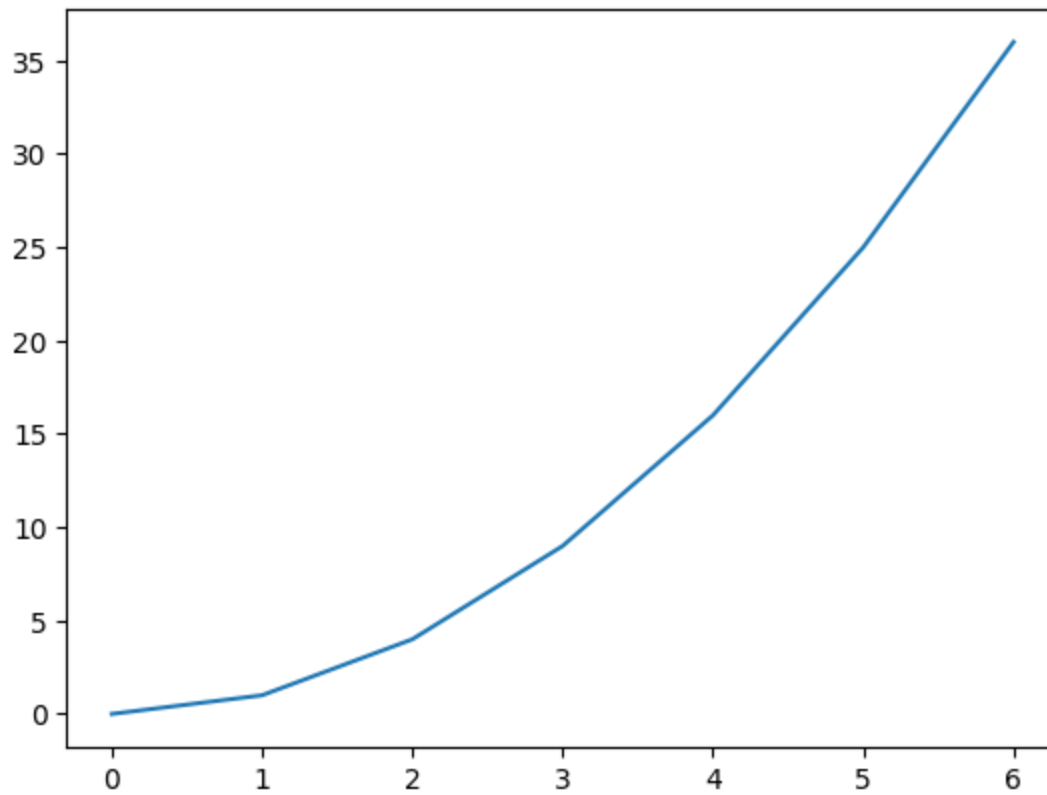
**08:30 - 14:30**

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## matplotlib

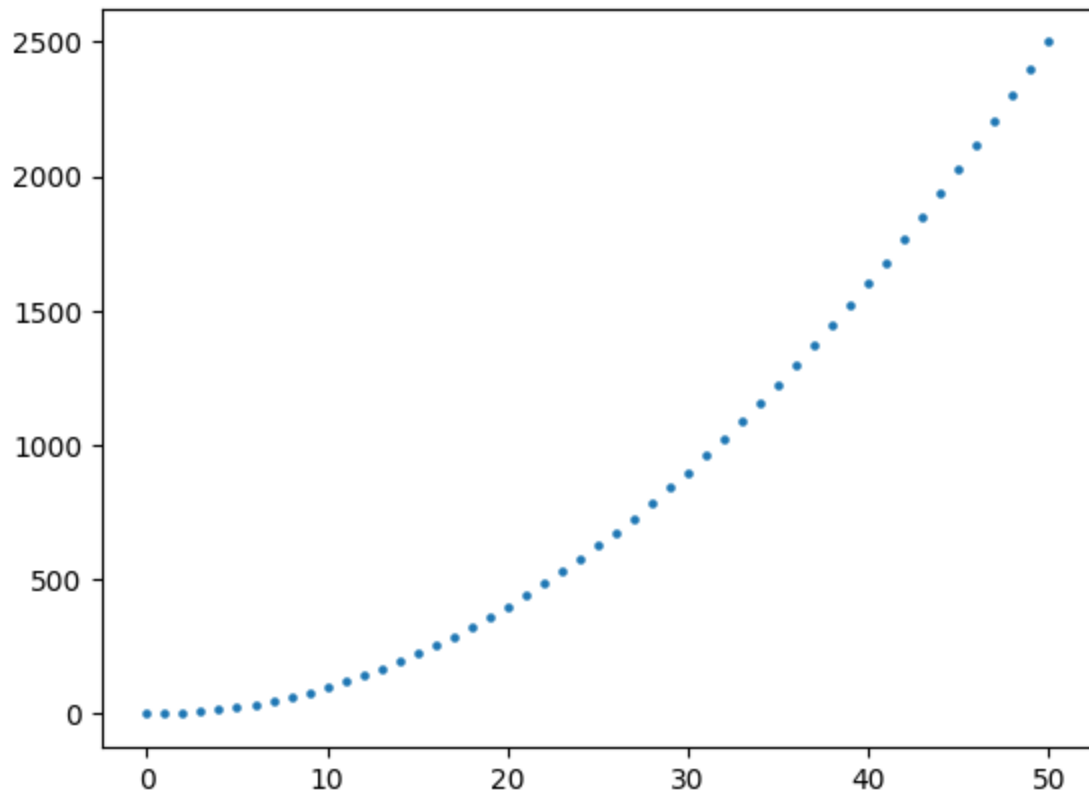
spezzata

```
In [8]: import matplotlib.pyplot as plt
x_values = [0, 1, 2, 3, 4, 5, 6]
y_values = [0, 1, 4, 9, 16, 25, 36]
plt.plot(x_values, y_values)
plt.show()
```



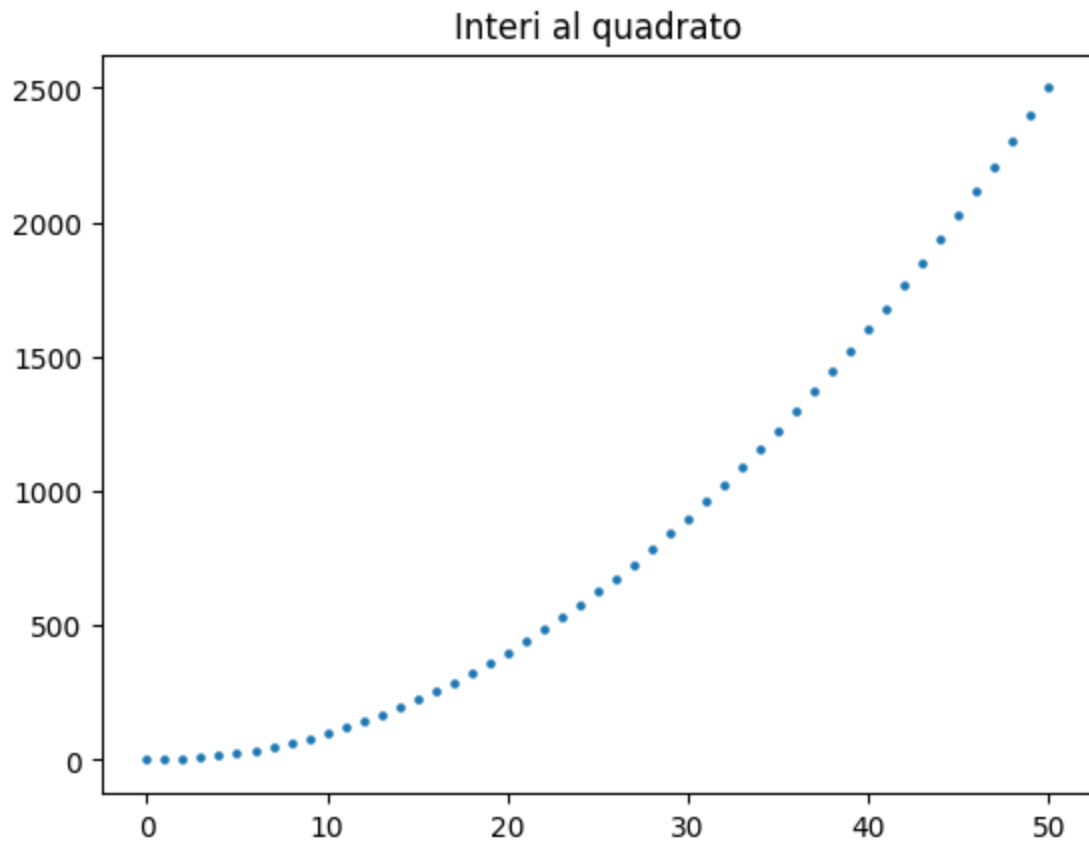
per punti

```
In [5]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, s=5)
plt.show()
```



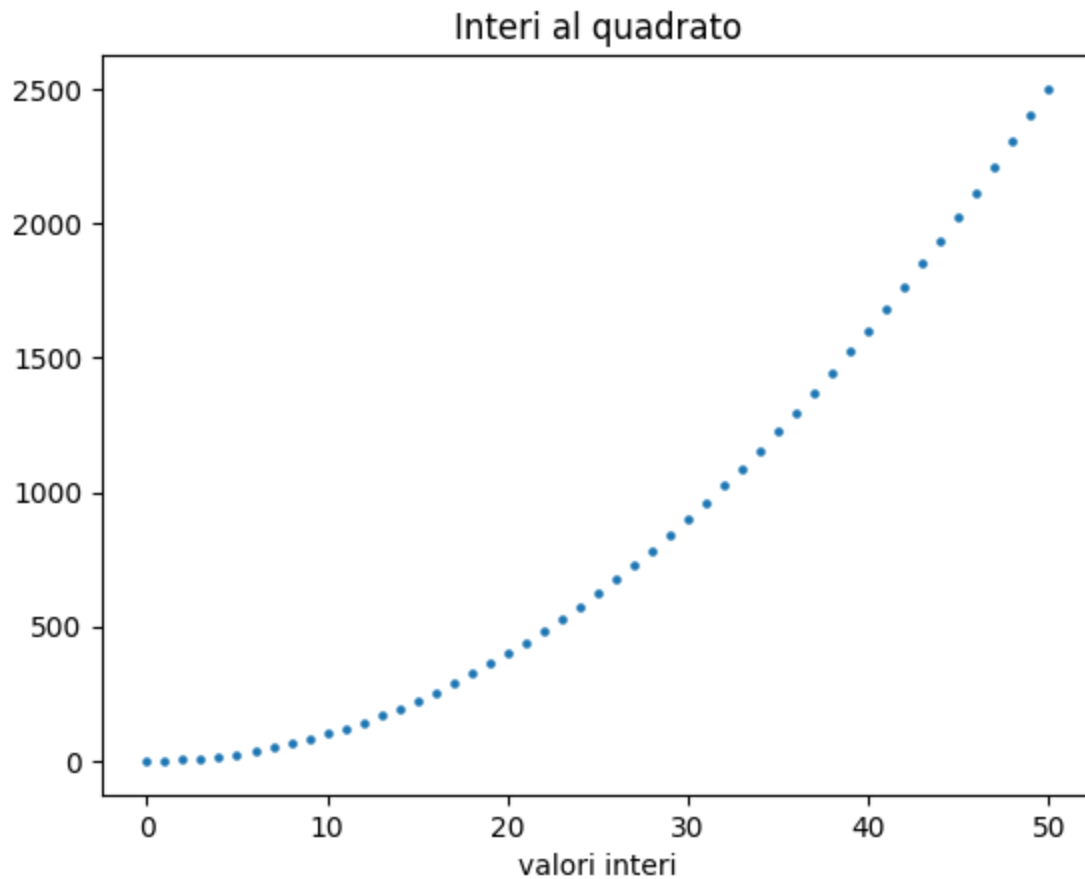
con titolo

```
In [7]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, s=5)
plt.title("Interi al quadrato")
plt.show()
```



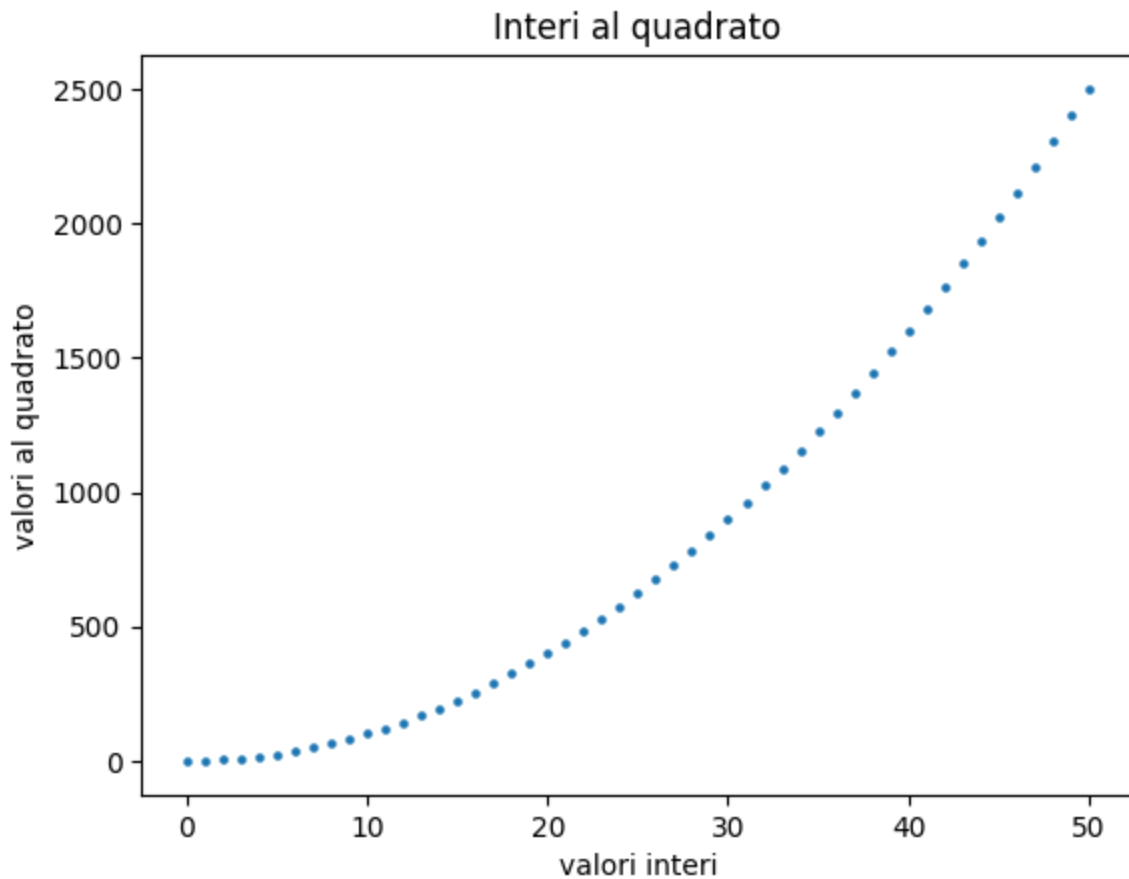
con nome ascisse

```
In [9]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, s=5)
plt.title("Interi al quadrato")
plt.xlabel("valori interi")
plt.show()
```



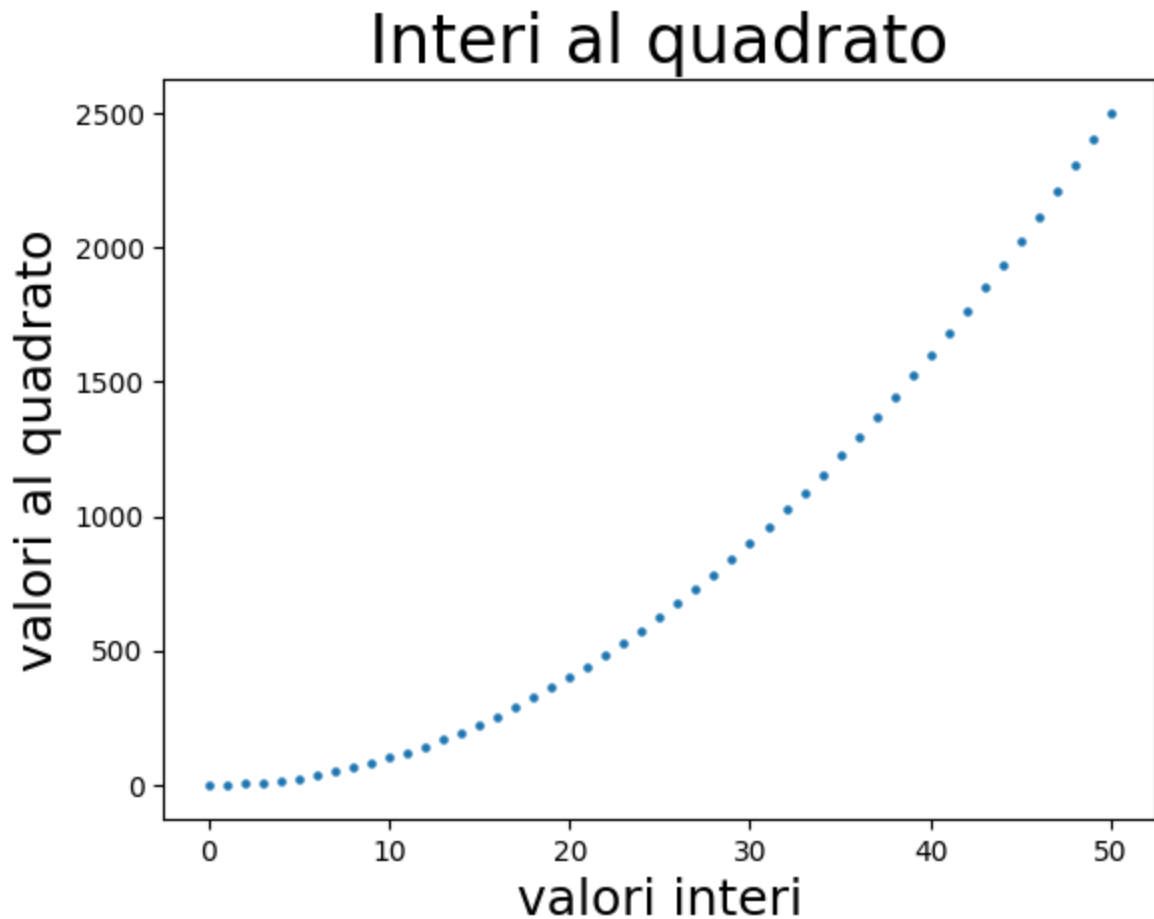
con nome ordinate

```
In [10]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, s=5)
plt.title("Interi al quadrato")
plt.xlabel("valori interi")
plt.ylabel("valori al quadrato")
plt.show()
```



impostando la dimensione del font

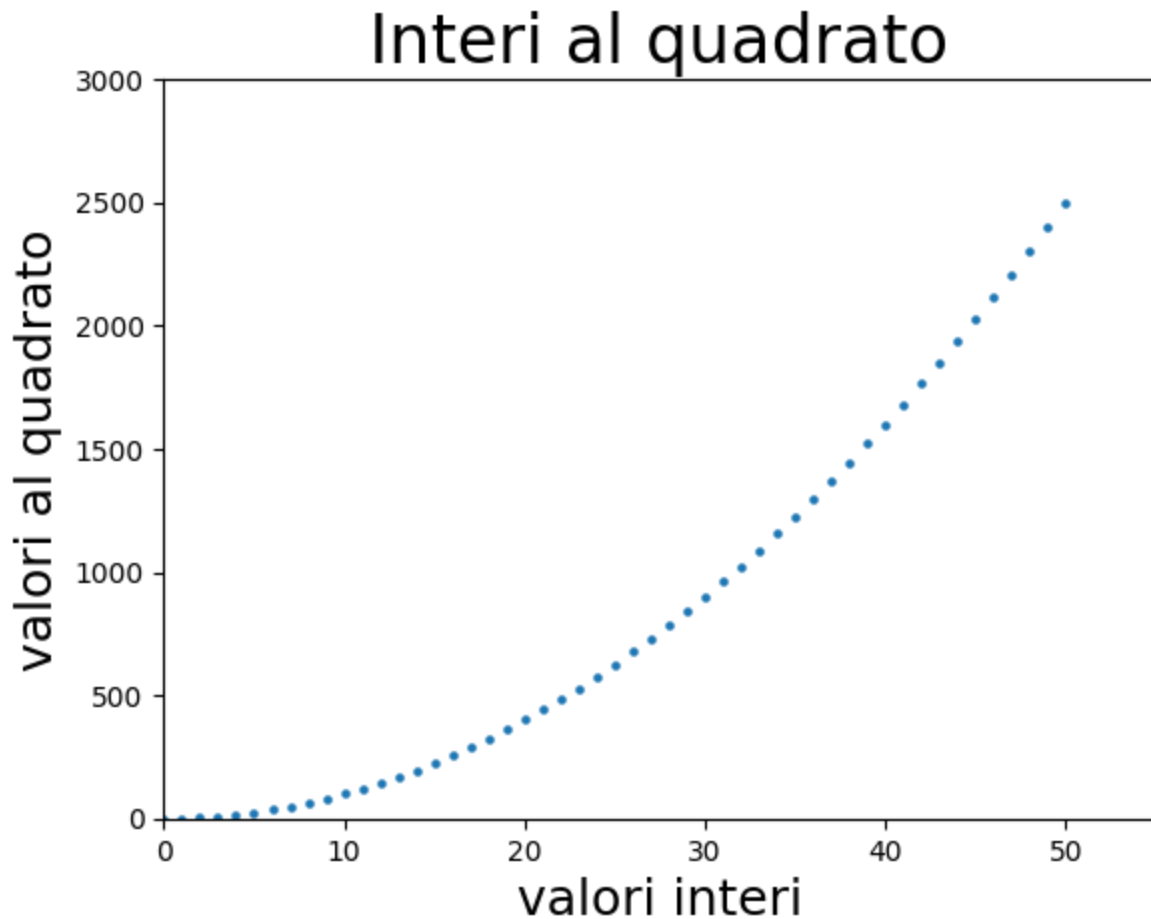
```
In [11]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, s=5)
plt.title("Interi al quadrato", fontsize=24)
plt.xlabel("valori interi", fontsize=18)
plt.ylabel("valori al quadrato", fontsize=18)
plt.show()
```



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specifica area del grafico

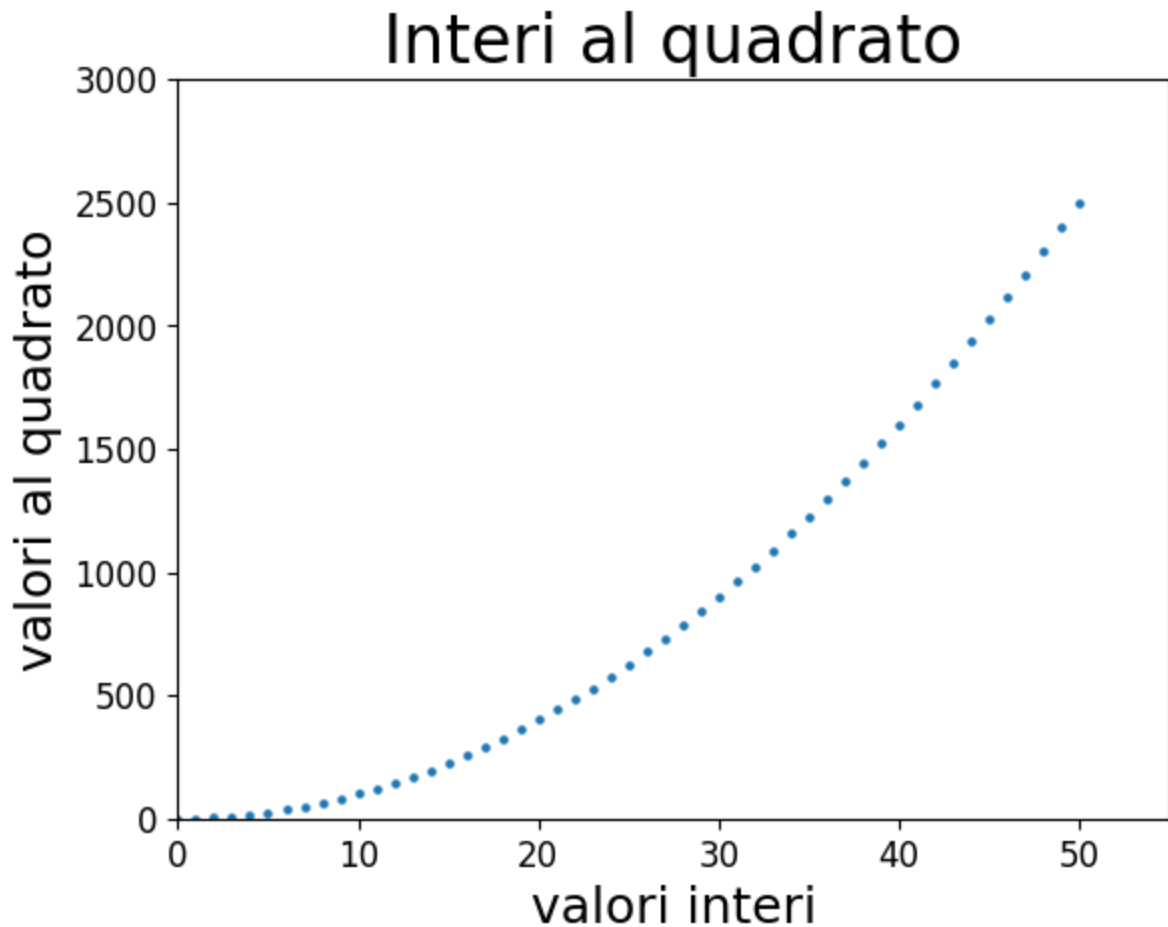
```
In [13]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, s=5)
plt.title("Interi al quadrato", fontsize=24)
plt.xlabel("valori interi", fontsize=18)
plt.ylabel("valori al quadrato", fontsize=18)
plt.axis([0, 55, 0, 3000])
plt.show()
```



dimensione del font dei valori sugli assi

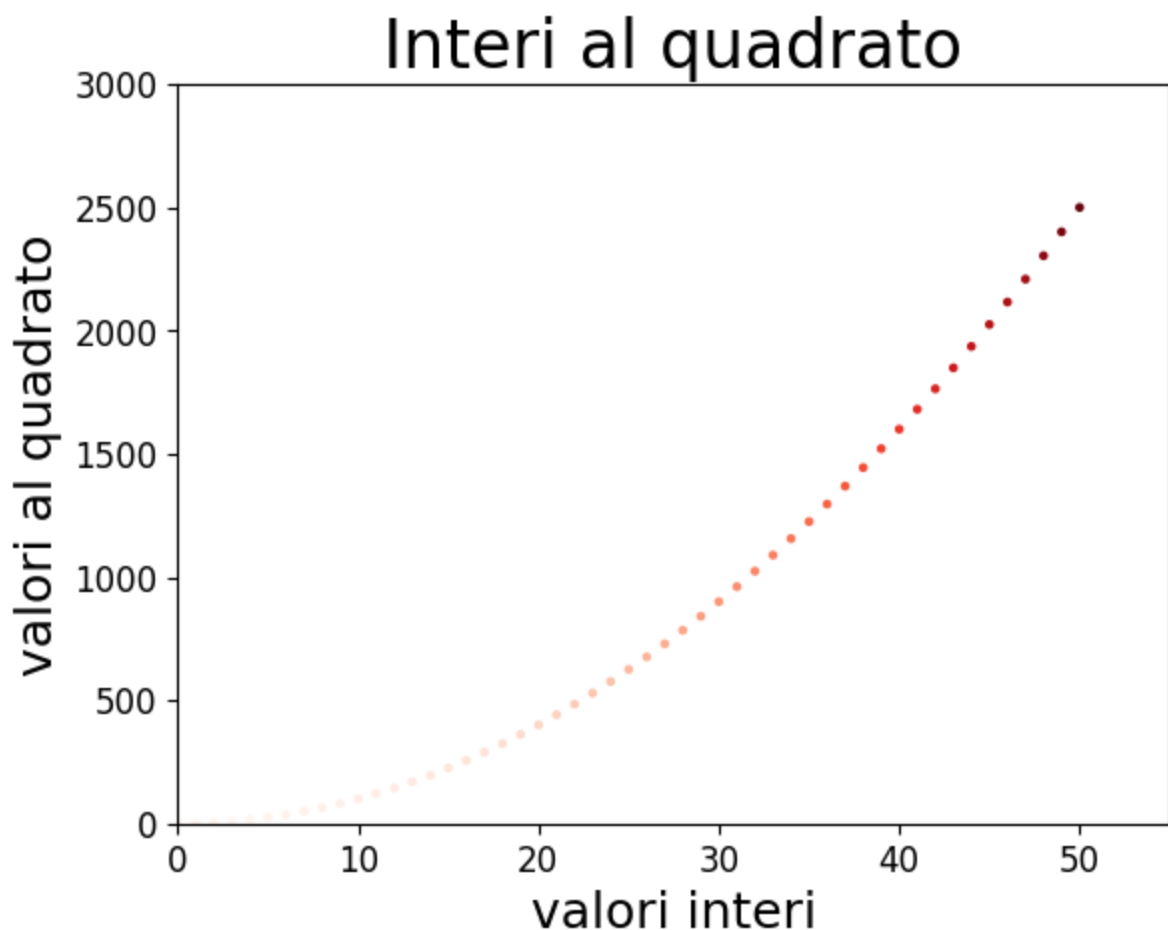
```
In [19]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, s=5)
plt.title("Interi al quadrato", fontsize=24)
plt.xlabel("valori interi", fontsize=18)
plt.ylabel("valori al quadrato", fontsize=18)
plt.tick_params(axis="both", which="major", labelsize=12)
plt.axis([0, 55, 0, 3000])
plt.show()
```





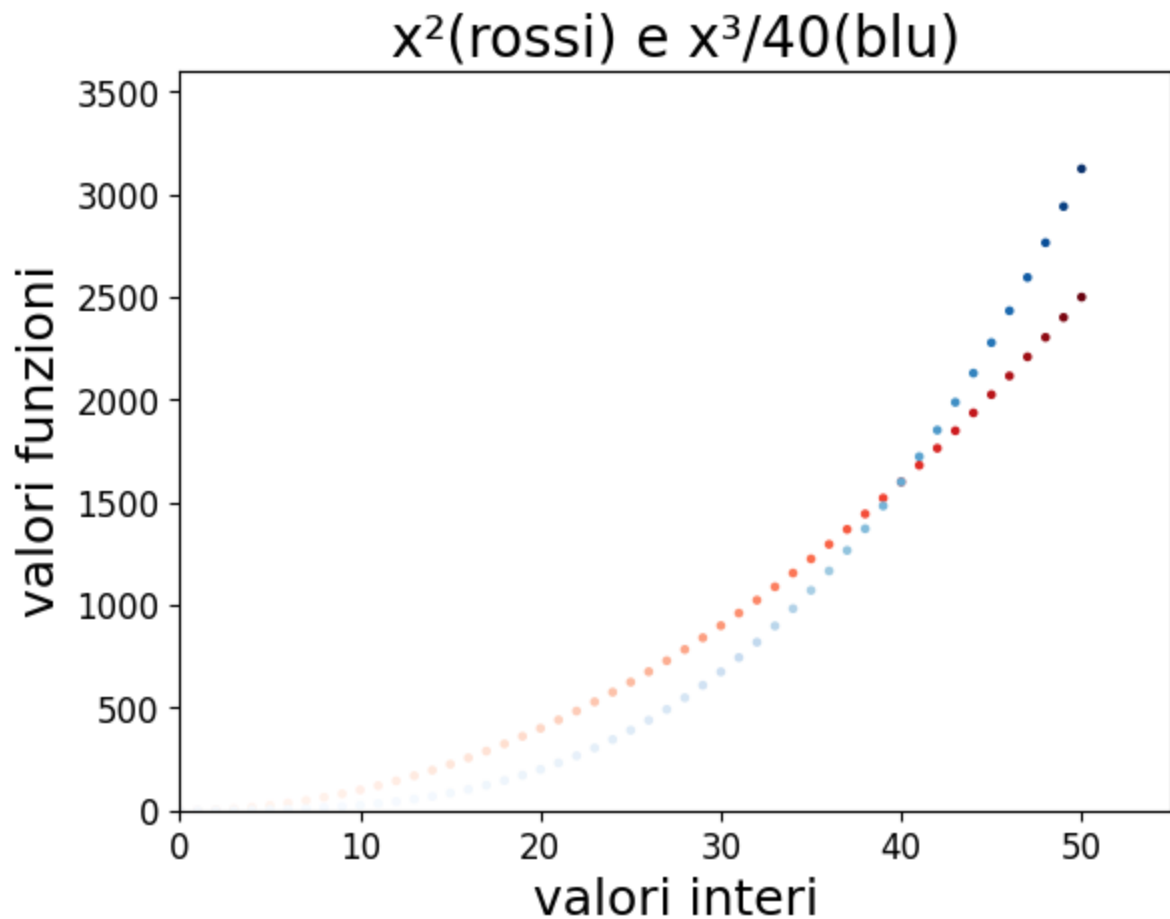
## gradiente colore

```
In [20]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values = [x ** 2 for x in x_values]
plt.scatter(x_values, y_values, c=y_values, cmap=plt.cm.Reds, s=5)
plt.title("Interi al quadrato", fontsize=24)
plt.xlabel("valori interi", fontsize=18)
plt.ylabel("valori al quadrato", fontsize=18)
plt.tick_params(axis="both", which="major", labelsize=12)
plt.axis([0, 55, 0, 3000])
plt.show()
```

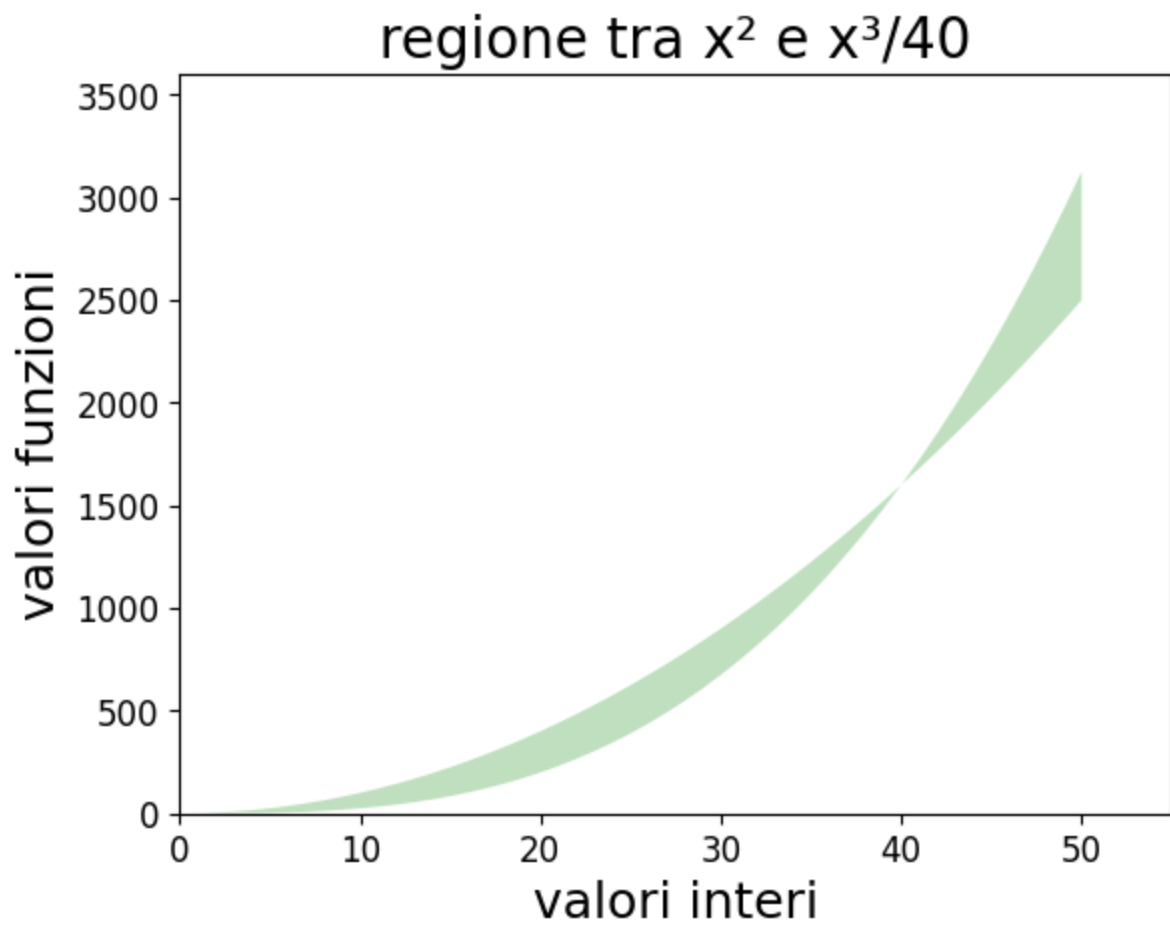


altri insiemi di dati

```
In [29]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values_A = [x ** 2 for x in x_values]
y_values_B = [x ** 3 / 40 for x in x_values]
plt.scatter(x_values, y_values_A, c=y_values_A, cmap=plt.cm.Reds, s=5)
plt.scatter(x_values, y_values_B, c=y_values_B, cmap=plt.cm.Blues, s=5)
plt.title("x2(rossi) e x3/40(blu)", fontsize=20)
plt.xlabel("valori interi", fontsize=18)
plt.ylabel("valori funzioni", fontsize=18)
plt.tick_params(axis="both", which="major", labelsize=12)
plt.axis([0, 55, 0, 3600])
plt.show()
```



```
In [31]: import matplotlib.pyplot as plt
x_values = list(range(51))
y_values_A = [x ** 2 for x in x_values]
y_values_B = [x ** 3 / 40 for x in x_values]
plt.fill_between(x_values, y_values_A, y_values_B, facecolor="green", alpha=0.5)
plt.title("regione tra  $x^2$  e  $x^3/40$ ", fontsize=20)
plt.xlabel("valori interi", fontsize=18)
plt.ylabel("valori funzioni", fontsize=18)
plt.tick_params(axis="both", which="major", labelsize=12)
plt.axis([0, 55, 0, 3600])
plt.show()
```



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Esercizi e ripasso