

Plotting Data

Spoken Tutorial Project

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

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Learning Objectives



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In this tutorial, we will learn about

- **Define a list of numbers**



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- ▶ Define a list of numbers
- ▶ Perform element wise squaring of the list



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- ▶ Plot data points
- ▶ **Plot errorbars**



System Specifications



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- ▶ **Python 3.4.3**



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- ▶ **Python 3.4.3**
- ▶ **IPython 5.1.0**



Pre-requisites



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- ▶ **run basic Python commands on the ipython console**



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- ▶ use **Plots interactively**



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- ▶ **Embellish a plot**



Pre-requisites

- ▶ run basic Python commands on the ipython console
- ▶ use Plots interactively
- ▶ Embellish a plot
- ▶ If not, see the relevant Python tutorials on <http://spoken-tutorial.org>



Example: Simple Pendulum



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Example: Simple Pendulum

- ▶ For a simple pendulum, length L is directly proportional to the square of time T
- ▶ we will be plotting L and T^2 values



Simple Pendulum Data

L	T
0.1	0.69
0.2	0.90
0.3	1.19
0.4	1.30
0.5	1.47
0.6	1.58
0.7	1.77
0.8	1.83
0.9	1.94



Exercise 1

Plot the given experimental data with large dots



Exercise 1 - Data

δL	δT
0.08	0.04
0.09	0.08
0.07	0.03
0.05	0.05
0.06	0.03
0.00	0.03
0.06	0.04
0.06	0.07
0.01	0.08



Exercise 2

Plot the given experimental data with small dots



Exercise 2 - Data

S	n	δS	δn
0.19	10.74	0.006	0.61
0.38	14.01	0.006	0.69
0.57	18.52	0.005	0.53
0.77	20.23	0.003	0.38
0.96	22.88	0.004	0.46
1.15	24.59	0.007	0.37
1.34	27.55	0.004	0.46
1.54	28.48	0.004	0.46
1.73	30.20	0.007	0.37



Summary

In this tutorial, we have learnt

- ▶ **Declare a list of numbers using the function “array”**
- ▶ **Perform element wise squaring using the “square” function**



Summary

- ▶ Use the various options available for plotting like dots, lines
- ▶ Plot experimental data such that we can also represent error by using the `errorbar()` function



Evaluation



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1. Square the following sequence.

▶ `distance_values=[2.1,4.6,8.72,9.03]`



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1. Square the following sequence.
 - ▶ `distance_values=[2.1,4.6,8.72,9.03]`
2. Plot L v/s T in red pluses from the Simple Pendulum Data



Solutions

1. `square(distance_values)`



Solutions

1. `square(distance_values)`
2. `plot(L,T,'r+')`



Forum to answer questions

- ▶ Do you have questions in **THIS Spoken Tutorial?**
- ▶ Choose the minute and second where you have the question.
- ▶ Explain your question briefly.
- ▶ Someone from the **FOSSEE** team will answer them. Please visit

<http://forums.spoken-tutorial.org/>



Forum to answer questions

- ▶ Questions not related to the Spoken Tutorial?
- ▶ Do you have general / technical questions on the Software?
- ▶ Please visit the FOSSEE Forum
<http://forums.fossee.in/>
- ▶ Choose the Software and post your question.



Textbook Companion Project

- ▶ The FOSSEE team coordinates coding of solved examples of popular books
- ▶ We give honorarium and certificate to those who do this

For more details, please visit this site:

<http://tbc-python.fossee.in/>



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- ▶ **Spoken Tutorial Project is a part of the Talk to a Teacher project**
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- ▶ **More information on this Mission is available at:**

<http://spoken-tutorial.org/NMEICT-Intro>



THANK YOU!

For more Information, visit our website
<http://fossee.in/>

