

Fit an Exponential Decay Curve

Spoken Tutorial Project

<https://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

Rani PV

IIT Bombay

9 December 2019



Learning Objectives



Learning Objectives

- **Add multiple graph panels to the canvas**



Learning Objectives

- **Add multiple graph panels to the canvas**
- **Remove a dataset from the graph panel**



Learning Objectives

- Add multiple graph panels to the canvas
- Remove a dataset from the graph panel
- Fit a given set of data points with non-linear regression method



System Requirements



System Requirements

- **Ubuntu Linux 16.04 OS**



System Requirements

- **Ubuntu Linux 16.04 OS**
- **Grace 5.1.25**



System Requirements

- **Ubuntu Linux 16.04 OS**
- **Grace 5.1.25**
- **Gedit 3.18.3**



Pre-requisites



Pre-requisites

- **Learner must be familiar with the Grace interface**



Pre-requisites

- **Learner must be familiar with the Grace interface**
- **For the prerequisite tutorials, please visit this site**
<https://spoken-tutorial.org>



Code Files



Code Files

- **Two input files used in this tutorial are provided in the Code files link**
- **Please download and extract the files**



Steps for Data Fitting



Steps for Data Fitting

- For data fitting, select an equation to fit the data



Steps for Data Fitting

- For data fitting, select an equation to fit the data
- Make an initial guess for the value of the coefficients



Steps for Data Fitting

- For data fitting, select an equation to fit the data
- Make an initial guess for the value of the coefficients
- Run the data fitting algorithm



Steps for Data Fitting



Steps for Data Fitting

- **Convergence is usually obtained with few iterations**



Steps for Data Fitting

- **Convergence is usually obtained with few iterations**
- **Examine the output parameters for goodness of the fit**



Steps for Data Fitting

- **Convergence is usually obtained with few iterations**
- **Examine the output parameters for goodness of the fit**
- **Plot the function and data together for visual representation**



Summary



Summary

- Added multiple graph panels in the canvas
- Deleted datasets from a graph panel
- Performed non-linear regression on an exponential decay curve



Assignment 1



Assignment 1

- Fit the data, given in the file **assignment1.txt** to a parabola
- Use an equation of the type
$$y = a_0x^2 + a_1x + a_2$$



Assignment 2



Assignment 2

- Fit the given data in the file **assignment2.txt**, to $\text{atan}(x)$



About the Spoken Tutorial Project

- Watch the video available at https://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- It summarises the Spoken Tutorial project



About the Spoken Tutorial Project

- Watch the video available at https://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- It summarises the Spoken Tutorial project
- If you do not have good bandwidth, you can download and watch it



Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- Conducts workshops using spoken tutorials
- Gives certificates to those who pass an online test
- For more details, please write to contact@spoken-tutorial.org



Forum for Specific Questions

- Questions in THIS Spoken Tutorial?
- Visit <https://forums.spoken-tutorial.org>
- Choose the minute and second where you have the question
- Explain your question briefly
- The Spoken Tutorial project will ensure an answer

You will have to register to ask questions



Acknowledgements

Spoken Tutorial Project is supported by

- **National Mission on Education through ICT (NMEICT)**
- **Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT)**

MHRD, Government of India

