Developing Scilab Toolbox for calling Python and its functions

Spoken Tutorial Project
https://spoken-tutorial.org
National Mission on Education through ICT
http://sakshat.ac.in

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In this tutorial, we will learn-

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- **Build a toolbox**

Learning Objectives

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- **Build a toolbox**
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- **Execute the Python functions in Scilab**

System Requirements

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- **Ubuntu Linux OS 18.04**

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- **Scilab 6.1.0**

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If not, for relevant tutorials, please visit https://spoken-tutorial.org

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Note: Linux OS version should be 18.04 and above

Scithon Toolbox

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- Scilab Python Interfacing toolbox by the name **Scithon**

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- **Scithon toolbox is used to call the Python functions inside Scilab**

Additional reading material

- **Installation of Python 3.8 on Ubuntu Linux OS**

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- **Reference material for the procedure to make the Scithon toolbox**

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- **About gateway functions used in this tutorial**

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Read the document to understand the concepts of

- ▸ **Creating a custom type to hold Python variables**

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- ▶ **Creating a custom type to hold Python variables**
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Read the document to understand the concepts of

- ▶ **Creating a custom type to hold Python variables**
- ▶ **Creating gateway functions using custom variable**
- ▶ **Building the toolbox**

- ▶ The files used in this tutorial are available in the **Code Files** link on this tutorial page

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- Make a copy and then use them while practicing

About header folder

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- **The files under the header folder are available in the Windows latest version of Scilab**

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- **These files are not available in the Linux version of Scilab**

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- **Copy these files and data folder to the Linux Scilab version**

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- **Compilation of the Scithon toolbox under Linux will work**

Scilab 6.1.0 - apt-get command

- ▶ **If you are using Scilab 6.1.0 installed via apt-get command, copy these files inside**

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- ▶ **/usr/include/scilab directory**

Reference Links : PyVar.CPP

- **https://docs.python.org/3 /extending/embedding.html**
- **https://docs.python.org/3/c- api/object.html**
- **https://docs.python.org/3/c- api/sequence.html**

- https://docs.python.org/3/c-api/dict.html
- https://docs.python.org/3.8/c-api/list.html
- https://docs.python.org/3/c-api/tuple.html

Builder script of Scithon Toolbox

- ▶ **Downloaded from scilab.org and modified it to build the scithon toolbox for Linux**

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- **These scripts compile the C or CPP code and generate shared object files**

Builder script of Scithon Toolbox

▶ **These shared object files will be used by the Scithon Toolbox**

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- Scilab will call the implemented functions

Summary

In this tutorial, we learnt:

- ▶ **Build a toolbox**
- ▶ **Load a toolbox**
- ▶ **Execute the Python functions in Scilab**

About the Spoken Tutorial Project

- Watch the video available at http://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

FOSSEE Forum

- **Please post your queries on Scilab in the FOSSEE forum.**
  https://forums.fossee.in/

Textbook Companion project

- ▶ **The FOSSEE team coordinates the Textbook Companion project.**

- ▶ **Contributors will receive `Certificates` and `Honorarium`.**

- ▶ **For more details, please visit: https://scilab.in/ Textbook_Companion_Project**

Lab Migration

- **The FOSSEE team coordinates the Lab Migration project.**
- **For more details, please visit: https://scilab.in/ Lab_Migration_Project**

Acknowledgements

- **Spoken Tutorial Project is funded by MHRD, Govt.of India.**
- **For more details, visit this website.**
  https://spoken-tutorial.org/

THANK YOU!