Introduction to Python and Scripting in Abaqus

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Agenda

- **Overview**
- **Python**
- **Scripting in Abaqus**
- **Specialized Postprocessing**
- **Advanced Topics**

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Overview

- The goal of this advanced seminar is to introduce you to the Abaqus Scripting Interface. The Abaqus Scripting Interface allows you to customize Abaqus to suit your specific requirements.

- Abaqus Release 6 makes extensive use of Python, a powerful, widely used scripting language. This seminar covers Python's basic syntax and provides numerous worked examples.

- The seminar includes use of Python for accessing Abaqus results on the output database (`.odb`) file, use of Python for scripting with Abaqus/CAE and Abaqus/Viewer, and general use of Python to accomplish varied programming tasks.
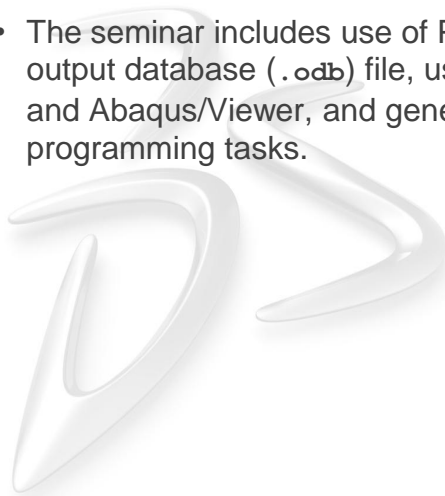
Overview

• **Motivation: Why customize Abaqus?**

    • Automate repetitive tasks

        • Model building

        • Job submission and monitoring

        • Postprocessing

        • Prescribe default behavior

    • Extend functionality

    • Enhance the interface

        • Graphical

        • Nongraphical

Provides automated environment for experienced analysts

Customized versions of Abaqus provide an effective analysis tool for a wide range of user expertise ...

Customized application

Provides advanced analysis functionality to non-FE users

Overview

Abaqus Scripting predominantly affects Abaqus/CAE customization

• **Abaqus/CAE customization**

    • The ASI allows you to customize much of the behavior of Abaqus pre and post-processing to suit your specific requirements.

    • Scripts that affect the Graphical User Interface are called GUI scripts. Those that do not are called kernel scripts.

• **Analysis Customization**

    • The Abaqus analysis products may be customized with user subroutines.

• **Site Customization**

    • Hardware, operating system, batch queuing, etc. may be tuned for Abaqus performance.
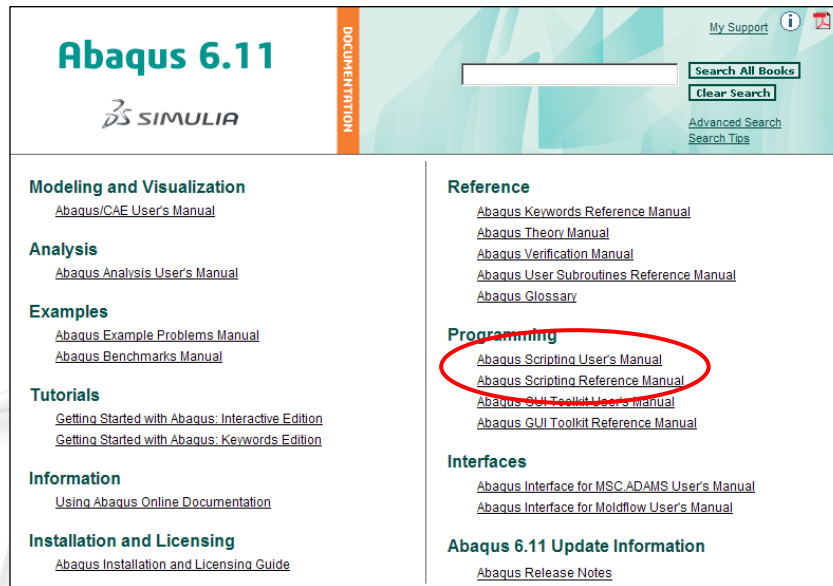
Overview

- **Two manuals* are presently available for scripting**

Abaqus 6.11

DOCUMENTATION

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Modeling and Visualization
- Abaqus/CAE User's Manual

Analysis
- Abaqus Analysis User's Manual

Examples
- Abaqus Example Problems Manual
- Abaqus Benchmarks Manual

Tutorials
- Getting Started with Abaqus: Interactive Edition
- Getting Started with Abaqus: Keywords Edition

Information
- Using Abaqus Online Documentation

Installation and Licensing
- Abaqus Installation and Licensing Guide

Reference
- Abaqus Keywords Reference Manual
- Abaqus Theory Manual
- Abaqus Verification Manual
- Abaqus User Subroutines Reference Manual
- Abaqus Glossary

Programming
- Abaqus Scripting User's Manual
- Abaqus Scripting Reference Manual
- Abaqus GUI Toolkit User's Manual
- Abaqus GUI Toolkit Reference Manual

Interfaces
- Abaqus Interface for MSC.ADAMS User's Manual
- Abaqus Interface for Moldflow User's Manual

Abaqus 6.11 Update Information
- Abaqus Release Notes

* these two manuals are available in electronic format only.

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Revision Status

Lecture 1	5/11	Updated for 6.11
Lecture 2	5/11	Updated for 6.11
Lecture 3	5/11	Updated for 6.11
Lecture 4	5/11	Updated for 6.11
Workshop 1a	5/11	Updated for 6.11
Workshop 1b	5/11	Updated for 6.11
Workshop 2a	5/11	Updated for 6.11
Workshop 2b	5/11	Updated for 6.11
Workshop 3a	5/11	Updated for 6.11
Workshop 3b	5/11	Updated for 6.11
Workshop 4a	5/11	Updated for 6.11
Workshop 4b	5/11	Updated for 6.11

Introduction to Python and Scripting in Abaqus

Python

Lecture 1

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Overview

- **Basics**
- **Types**
- **Programming Constructs**
- **Namespaces**
- **Modules**
- **Exceptions**
- **Examples**
- **Workshops**

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Scripting in Abaqus

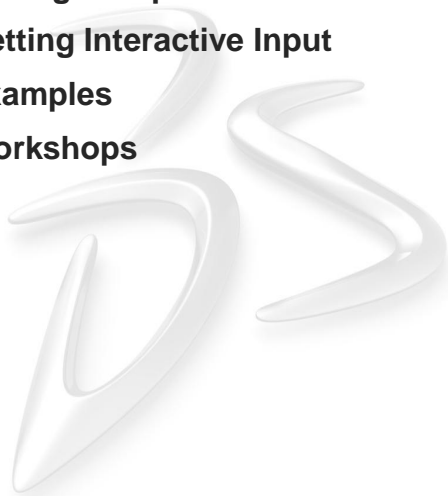Lecture 2

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Overview

- **The Abaqus Scripting Interface**
- **The Abaqus Object Model**
- **Abaqus Types**
- **Abaqus Modules**
- **Setting Abaqus Defaults**
- **Getting Interactive Input**
- **Examples**
- **Workshops**

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Specialized Postprocessing

Lecture 3

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Overview

- **The Abaqus Output Database**
- **Automating Postprocessing Tasks**
- **Postprocessing External Data**
- **Examples**
- **Workshops**

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Advanced Topics

Lecture 4

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Overview

- **Exploring Your Data**
- **Abaqus Architecture**
- **Job Monitoring**
- **Custom Data**
- **Plug-ins**
- **Debugging Scripts**
- **Abaqus PDE**
- **Object-Oriented Programming**
- **Python Classes**
- **Example**
- **Workshops**

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