CATIA Automation
Language: **Python**

Training Structure

Module 1: Python Programming   **Module 4**: Drawing Automation
Module 2: Tkinter GUI Programming   **Module 5**: Part Automation
Module 3: CATIA Files and UI Automation   **Module 6**: Assembly Automation

Training Highlights

Online Training | Flexible Timings | Trainer: 25 yrs Exp. | Duration: 6 Wks | 1 Hour Daily

Basic to Advanced | 10 Industry Projs | Certificate | Support after Training | CuttingEdge Tech

List of Projects

1. Geometric Calculator   **6**. Automatic Title Block Update
2. Batch Processor   **7**. Estimate Cutting Cost
3.Paper Estimation   **8**. Estimate Machining Cost
4. Create 3 Standard Dwg Views   **9**. Parametric Parts
5. Modify Dimensions in Bulk   **10**. Product Configurator

Module 1 : Python

- ❖ Installing Python
- ❖ Running Python programs
- ❖ Syntax, Comments, User Input, Print results, and control Program Flow
- ❖ Variables: Decimal, Integer, Strings, Boolean
- ❖ String Variables: Find, Replace, Formatting and Slicing
- ❖ Datatypes, Typecasting and Validations
- ❖ Arithmetic Operations
- ❖ Math Library and Functions
- ❖ Lists, Tuples, Dictionaries and Sets
- ❖ List Operations - Slicing and Data Extraction
- ❖ String Operations - Slicing and Manipulations
- ❖ Conditionals : If and Elif
- ❖ Chaining Comparison Operators
- ❖ Loops: For, While
- ❖ Functions: Arguments, Return Statements and values
- ❖ Functions: Optional Arguments
- ❖ Functions: Multiple Return Values
- ❖ Function Help and DocStrings
- ❖ Modules and the Python standard library
- ❖ Exceptions Handling: Try Catch Except
- ❖ Debugging
- ❖ Variables scope
- ❖ Lambda functions
- ❖ Installing 3rd party packages using pip
- ❖ List comprehensions

Bonus Module: Excel Automation

- ❖ Connect to Excel
- ❖ Access excising workbooks
- ❖ Create new workbooks
- ❖ Create new worksheets
- ❖ Access cells using names and indices
- ❖ Print a range of cells
- ❖ Write values to cells
- ❖ Write formulas to cells
- ❖ Evaluate formulas
- ❖ Access a range of cells and parse a range
- ❖ Read values from a range
- ❖ Save workbooks

Module 2 : Tkinter GUI

- ❖ Geometry and mainloop
- ❖ Project - Geometric calculator
- ❖ Setting dialog box properties, title, icon, size and location
- ❖ Adding widgets and adjusting their properties and placement
- ❖ Tkinter Datatypes - Double, Integer, Strings, and Boolean
- ❖ Data Type Conversion - tkinter variables and python variables
- ❖ Labels - static and dynamic
- ❖ Entry Textboxes - storing user input from textboxes into variables
- ❖ Setting default values and last used values in text boxes
- ❖ Button widget - formatting and calling functions
- ❖ Check boxes and radio buttons
- ❖ Listboxes - single selection and multiple selections
- ❖ Listboxes - adding items static and dynamic
- ❖ Listbox selection event binding
- ❖ Listbox display total count and selection count
- ❖ Listbox, remove selected item and remove all items
- ❖ Listbox - add items from textbox
- ❖ Scrollbar - adding scrollbar to a listbox
- ❖ Spinner widget - setting range and layout
- ❖ Scale widget - setting range and layout
- ❖ Images - displaying images in a dialog box
- ❖ File selection dialog
- ❖ Single and multiple files
- ❖ Adding file filters
- ❖ Folder selection dialog
- ❖ Selecting all files from folder dialog
- ❖ Adding file filters for folder dialog
- ❖ Opening files in associated application
- ❖ Message boxes - information, query and warning
- ❖ Configuring single line and multiline messages
- ❖ Button configurations and icon synchronizing
- ❖ Checking message box responses against button configurations
- ❖ Reading single and multiple files from a file dialog
- ❖ File and directory functions
- ❖ File and folder operations
- ❖ Text files - read, append and write with practical applications
- ❖ Manipulating file paths and extensions
- ❖ Option menu, add and remove items
- ❖ Handling multiple dialogs
- ❖ Adding pulldown menus, adding menu items
- ❖ Cascading menus and adding commands to menu items

Module 3 : CATIA UI and Document Automation

1. Getting Started

- ❖ Connect to CATIA
- ❖ Traversing the CATIA object model
- ❖ CATIA interface elements
- ❖ CATIA workbenches and document type
- ❖ Read-write various properties of the CATIA interface

2. CATIA Documents:

- ❖ Create new CATIA files - Part, Drawing and Assembly
- ❖ Open, Close, Save and SaveAs CATIA files
- ❖ Close all documents in the Session
- ❖ Export CATIA documents to other formats
- ❖ Activate files in a session
- ❖ Loop through files in the session

4. File Handling

- ❖ Standard file dialogs to select CATIA files
- ❖ CATIA File dialog for file selection
- ❖ Setting CATIA file filters
- ❖ Single and multiple file selection

5. Batch Processing

- ❖ Industry Project - Create a Batch Processor for Handling CATIA documents
- ❖ Use the Folder selection dialog, gather all files of a specified type into a tuple
- ❖ Export the batch of documents to formats like DWG, STP, etc.

Module 4 : CATIA Drawing Automation

6. Managing Sheets In Drawings

- ❖ Creating drawing sheets
- ❖ Accessing, counting sheets
- ❖ Extracting sheet info
- ❖ Switching between sheets
- ❖ Deleting sheets
- ❖ Exporting sheets to DXF, etc.
- ❖ Industry Project - Estimating Paper Requirement for Printing Drawings

7. Drawing Views

- ❖ Create drawing views
- ❖ Determining view vectors for side and front views
- ❖ Create the front view and projection views
- ❖ Zoom fit, in and out
- ❖ Industry Project - Creating Standard Views of a Model in CATIA

8. Dimensions in Drawings

- ❖ Learn to handle Dimensions In CATIA Drawings
- ❖ Traversing dimensions and checking dimension types
- ❖ Getting and setting properties of dimension like prefix and suffix
- ❖ Industry Project - Modifying Dimensions in Bulk

9. Handling Text In Drawings

- ❖ Access text objects in a drawing document
- ❖ Persistent text objects in drawing
- ❖ Industry Project - Automatic Title Block Update program

10. 2D objects in Drawings

- ❖ Creating 2D objects in a drawing document
- ❖ Accessing 2Delements and its geometrical properties
- ❖ Industry Project - Estimate Cutting Cost of a Milling Profile

Module 5 : CATIA Part Automation

11. Part Features

- ❖ Traversing the features of a CATIA model
- ❖ Part bodies and shapes
- ❖ Determine type of features like hole, pocket, draft, fillet, etc.
- ❖ Determine features sub-type like various hole types
- ❖ Industry Project - Estimate Machining Cost for a Plate with Various Holes

12. Parametric Parts

- ❖ Create and control parametric part in CATIA
- ❖ Industry Project - Update the features of a Parametric Shaft with a Keyway.

13. Advanced Part Features

- ❖ Creating variations of a part by manipulating features
- ❖ Industry Project - Build a Part Configurator from Scratch

Module 6 : CATIA Assembly Automation

14. CATIA Products and Physical Properties

- ❖ Traverse through all components of a CATIA Product
- ❖ Extract physical properties like area, mass, volume, etc.
- ❖ Industry Project - Material Estimation for Spray Painting

15. CATIA Assembly Generation

- ❖ Inserting parts into a product
- ❖ Create and link library of components
- ❖ Create and modify the component matrix
- ❖ Move, rotate and scale components in an assembly using a matrix

16. Product Configurator

Product configurator are multifunctional systems that act as an interface between sales and product design.

- ❖ Industry Project - Create a CATIA Product Configurator
- ❖ Automatically generate custom assemblies
- ❖ Create BoM, drawings, cost, quotations, product images, reports & catalogs
- ❖ Create and set up a parts library
- ❖ Build a UI to choose parts from the library
- ❖ Traverse a CATIA product & build the product configuration as specified by the user

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Other eBooks and Training Programs from CADVertex:

- ❖ CATIA Automation: VB.Net or CSharp or Python

- ❖ SolidWorks Automation: VB.Net or CSharp or Python

- ❖ Solid Edge Automation: VB.Net or CSharp or Python

- ❖ Inventor Automation: VB.Net or CSharp or Python

- ❖ NX Open: VB.Net or CSharp with Win Forms

- ❖ NX Open: VB.Net or CSharp with Block UI Styler

- ❖ Knowledge Fusion

- ❖ Knowledge Fusion with Block UI Styler

- ❖ cMayoCAD: Learn to build a new CAD program from scratch using a Geometric Modeling Kernel and CSharp

- ❖ Machine Learning for Engineers with Python

- ❖ CATIA Automation with Python and Machine Learning

- ❖ NX Automation and Machine Learning with Python

- ❖ Solid Edge Automation with Python + Machine Learning

- ❖ SolidWorks Automation with Python + Machine Learning

- ❖ Inventor Automation with Python + Machine Learning

- ❖ Fast track course in Python with Machine Learning for VB.Net experts

- ❖ Fast track course in Python with Machine Learning for CSharp experts

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