

# ADVANCE LIBRARIES IN PYTHON

```
    mirror_obj.select = 1
    context.scene.objects.active = context.scene.objects.get("Selected" + str(modifier))
    mirror_obj.select = 0
    bpy.context.selected_objects.append(data.objects[one.name])
    if len(bpy.context.selected_objects) > 1:
        int("please select exactly one object")
    else:
        OPERATOR.bl_rna["CLASSES"] = [CLASSE]
```



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# STUDENT DETAILS :

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- Div : D
- Batch : D5
- College : Silver Oak College Of Engineering And Technology
- Roll No : 146
- Subject : Programming In Python
- Branch : Computer Science And Engineering
- Topic : Mini Project “On Advance libraries In Python”
- GitHub Link : <https://github.com/kushwahadeep/assigment3-paython.git>



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# 1. NUMPY :

NumPy is the short name for Numerical Python, which is a Python library predominantly used for technical and scientific computing. Its array-oriented computing capabilities make it an essential tool for fields such as linear algebra, statistical analysis, and machine learning.

## Key Features:

- `numpy.ndarray` is a data structure, a multidimensional array that allows the storage and manipulation of numerical data
- NumPy contains many functions that allow operations to be performed element-wise on arrays.
- NumPy supports linear algebra such as matrix multiplication, eigenvalue decomposition, and solving linear equations.



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## 2. PANDAS :

Pandas is an open-source data manipulation library for Python. It is built on top of the NumPy library. It introduces two primary data structures Series and DataFrame. Series is a one-dimensional labelled data whereas DataFrame is a two-dimensional labelled data resuming a table.

### Key Features:

- Pandas has DataFrame and Series, data structures for handling two-dimensional tabular data and one-dimensional arrays.
- Pandas offers special tools for working with time series data.
- Pandas have tools for handling missing data, duplication, and other cleaning tasks.



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## 3. MATPLOTLIB :

Matplotlib is a data visualization library that allows developers to create static, animated and interactive animations in Python. The graphs and plots it produces are extensively used for data visualization.

### Key Features:

- It supports line plots, bar charts, scatter plots, and more.
- Object Hierarchy: It follows a hierarchical structure where the top-level container is called a Figure and individual plots or charts are contained within Axes.
- The pyplot module provides a simple interface for creating plots. The plot function is used for creating line plots while other functions like scatter(), bar(), and hist() are used for different visualization.



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## 4. TENSORFLOW :

Tensorflow an open-source Python library for machine learning and artificial intelligence. It is particularly used for training and inference of deep neural networks.

Key Features:

- It is based on data flow graphs where nodes represent mathematical operations and edges represent tensors.
- It is a machine-learning library developed by Google.
- It helps in the creation of computational graphs and execution on various hardware platforms.



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## 5. PYTORCH :

PyTorch is an open-source library designed for tasks such as computer vision and natural language processing (NLP).

Key Features:

- PyTorch makes use of n-dimension arrays known as tensors to represent data.
- PyTorch performs operations on tensors and represents them on a dynamic computational graph.
- PyTorch is efficient in the training of neural networks as it can efficiently calculate the derivative of tensors.



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## 6. SCIKIT-LEARN :

Scikit-learn is a machine-learning library that provides tools for data mining and analysis. It includes lots of machine learning algorithms for different tasks.

### Key Features:

- It has a consistent API which makes it easier to learn and use. The uniformity of the API across different algorithms helps in switching between models.
- It offers various algorithms for classification, regression, clustering, and dimensionality reduction.
- It can easily integrate with Python libraries such as Pandas and NumPy making it easy to work with different data formats.



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## 7. KERAS :

Keras is a high-level neural network API that is used for building artificial neural networks. It is modular and helps us to construct neural network models layer by layer.

Key Features:

- It provides a user-friendly interface that simplifies the complex process of creating and training neural networks.
- With its integration into Tensorflow, it inherits the strengths of Tensorflow.
- Keras supports the building of RNN and CNN catering to a wide range of ML tasks.



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## 8. SEABORN :

Seaborn is a data visualization library which is based on Matplotlib.  
It is very helpful in creating  
beautiful statistical plots with minimal code.

Key Features:

- Seaborn has many high-level functions that simplify the process of creating complex statistical visualization.
- The themes and color palettes built-in chances the visual appeal of the plots.
- It works perfectly with Pandas DataFrames, it takes DataFrames as input making it easier for users working with tabular data.



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## 9. PLOTLY :

Plotly is a Python library helpful in the creation of interactive and visually appealing plots and charts for your data.

Key Features:

- Plotly can work smoothly with popular libraries such as pandas, NumPy, and scikit-learn.
- Plotly can create interactive charts and graphs that bring data to life.
- Plotly allows various chart types such as line charts, bar charts, and scatter plots to showcase your data.



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# 10. NLTK:

Natural Language Toolkit (NLTK) is a library for working with human language. It provides an easy-to-use interface.

Key Features:

- NLTK is used for text processing, it has various tools for tokenization, stemming, etc.
- NLTK implements various natural language processing algorithms and techniques.
- NLTK easily integrates with other Python libraries such as sci-kit-learn and Matplotlib etc which enhances its functionality.



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# 11. PYGAME :

Pygame is a Python library that is used for developing video games or multimedia applications.

Key Features:

- Pygame contains computer graphics and sound libraries that can be used with Python.
- We can very easily create 2D games, simulations, and multimedia programs.
- You can work with PyGame on various OS such as Windows, macOS, and Linux.



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# CONCLUSION

The top 11 python libraries discussed in the article cover a wide range of applications from numerical computing, and data manipulation to machine learning, natural language processing and data visualization. These libraries simplify the development tasks and also promote a collaborative ecosystem that promotes code reusability. Whether you are working on scientific computing, data analysis, machine learning, web scraping or game development, these libraries are going to be used in them therefore as a Python developer you should explore them. Python libraries help developers build robust software, making Python a favorite among developers.



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# Thank you



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