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Artificial Intelligence/Machine Learning Bootcamp

Day-3 "Python Starter Pack: Key Topics You Should Know"

Agenda Overview

This notebook covers three important topics in Python that are useful for both beginners and non-programmers:

Agenda Overview

1.Python Libraries

Learn what libraries are and how they help you perform tasks quickly using pre-written code.

2.Errors and Exceptions

Understand common mistakes in Python and how to handle them without crashing your program.

3.Python Keywords

Get to know the special words Python uses to define its rules and structure.

1.Python-Libraries

All Python Libraries and Their Use – A Beginner's Guide (by a Beginner)

Hey everyone! I'm grateful to share something helpful for all Python learners like me — a quick beginner-to-beginner overview of the **most commonly used Python libraries** and **what they're used for**!

Whether you're working on data, ML, automation, or just getting started, these libraries will make your coding life 10x easier.

Python Libraries & What They Do (In Simple Words)

Library	Use Case (What it does)
NumPy	Works with numbers and arrays, like Excel but in Python
Pandas	For data tables and analysis (just like spreadsheets)
Matplotlib	Draws graphs and charts
Seaborn	Beautiful, high-level statistical visualizations
Scikit-learn	Machine Learning – training models & predictions
TensorFlow	Deep Learning – neural networks, AI stuff
Keras	Simpler Deep Learning library (runs on top of TensorFlow)
OpenCV	Computer vision – working with images, face detection, etc.
NLTK / SpaCy	Natural language processing (NLP) – text & language tasks
Requests	For accessing data from the internet (APIs, websites)
BeautifulSoup	Web scraping – extract info from websites
Flask	Build small web apps using Python
Django	A full web development framework (more structured than Flask)
Pygame	For building simple games using Python
Time / Datetime	Handling dates, time, delays in Python

Random	Generate random numbers, choices (great for games!)
OS	Interact with files and folders on your computer
Sys	System-related functions, like getting Python version
Math	Basic math operations – square root, factorial, etc.

Just getting started?

Start with:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

These three are the gems for Data Science learners!

2.Errors-and-Exceptions

What are Errors & Exceptions?

Errors = Mistakes in your code.

Exceptions = Special kinds of errors Python tells you about while the code is running.

They help us know what went wrong, where, and why.

Most Common Python Errors (with simple meanings)

Error Type Use Effect

1.**NameError** : When a variable is not defined. Program crashes.

2.**TypeError** : Wrong data type used. Stops execution.

3.**ValueError** : Invalid value for an operation. Aborts current operation.bb

4.**ZeroDivisionError** : Division by zero. Terminates operation.

5.**IndexError** : Accessing an invalid index. Crashes list/tuple access.

6.**KeyError** : Invalid dictionary key. Fails dictionary lookup.

7.**AttributeError** : Invalid attribute access. Fails method/property use.

8.**ImportError ./ModuleNotFoundError** : Missing module or file. Fails to load module

9 .**FileNotFoundError** : File not found during read/write. I/O operation fails.

How to Handle Errors in Python?

In [1]:
```
try:
    number = int(input("Enter a number: "))
    result = 10 / number
    print("Result is:", result)

except ZeroDivisionError:
    print("You cannot divide by zero!")

except ValueError:
    print("Please enter a valid number.")

finally:

    print("This part always runs.")
```

```
Result is: 2.0
This part always runs.
```

few examples

1.print(10 / 0) # ZeroDivisionError

2.print(5 * 2) # Wrong logic

3.def greet(): print("Hello") # IndentationError

3.Python-Keywords

What are Python Keywords?

Keywords are special words in Python that have a **fixed meaning**. You **cannot use them** as variable names or function names. They are **already reserved** by Python to do specific tasks.

Examples of Python Keywords:

Keyword	Simple Meaning
`def`	Used to **define a function**.
`if`	Checks a **condition** (used in decisions).
`else`	Runs when `if` is **not true**.
`elif`	**Else if** – another condition to check.
`while`	Runs a block **again and again** while a condition is true.
`for`	Used for **looping** over items.

| `break` | **Stops** the loop early.
| `continue` | **Skips** one loop and goes to the next. | | `return` | Sends a value **back** from a function. | | `in` | Checks if a value is **inside** something (like a list). | | `is` | Checks if two things are the **same object**. | | `and` | Both conditions must be true. | | `or` | Any one condition can be true. | | `not` | Makes true → false, and false → true. | | `True` / `False` | These are **Boolean** values (Yes/No or 1/0 type values). | | `None` | Means **nothing** or empty. | | `import` | Use to bring in **external code or libraries**. | | `class` | Used to define a **class** (used in object-oriented programming). | | `try` / `except` | Used to **handle errors** without crashing the program. | | `pass` | A placeholder – does nothing. | | `global` | Tells Python a variable is **global** (not just inside a function). | | `lambda` | A small **anonymous function** (used for short one-line functions). | | `yield` | Used with functions to **return a generator**. | | `assert` | Used for **debugging** – checks if something is true. | | `with` | Simplifies some actions like opening files. | | `from` | Works with `import` to **get specific things** from a module. | | `del` | Deletes a variable, item, or object. | | `raise` | **Creates a custom error** in your program. |

Remember:

- There are around **35 keywords** in Python.
- You can check all keywords by this code:

```
import keyword
print(keyword.kwlist)
```

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