**LEARNING ASSINMENT-1**

Membership Operators=> in and not in

These operators are used to check whether a value exists within an iterable like a list, tuple, string, set, or dictionary.

In=> Returns True if the value exists in the sequence.

not in=> Returns True if the value does NOT exist in the sequence.

Identity Operators: is and is not

These operators compare the memory location (identity) of two objects, not just their values.

Is=> Returns True if both variables point to the same object (same memory location).

is not=> Returns True if the variables do NOT refer to the same object.

Difference Between UTF (Unicode) and ASCII

Both UTF (Unicode Transformation Format) and ASCII (American Standard Code for Information Interchange) are character encoding schemes, but they differ significantly in terms of capability, range, and purpose.

ASCII (American Standard Code for Information Interchange):

Developed: In the 1960s

Bit Size: 7-bit encoding (supports 128 characters: 0 to 127)

Character Set: Includes English letters (A–Z, a–z), digits (0–9), punctuation, and control characters (like newline, tab).

Limitation: Cannot represent characters from other languages like Chinese, Arabic, emojis, etc.

UTF (Unicode Transformation Format):

Developed: In the 1990s to support global languages

Bit Size: Variable-length encoding:

UTF-8: 1 to 4 bytes (most common, backward compatible with ASCII)

UTF-16: 2 or 4 bytes

UTF-32: 4 bytes (fixed length)

Character Set: Supports over 1.1 million characters, including:

Global languages.

Emojis.

Mathematical symbols.

Python2 and Python3

Python 2 and Python 3 are two major versions of the Python programming language. While Python 2 was widely used for many years, Python 3 is the present and future of Python development. Python 2 reached its end-of-life on January 1, 2020, meaning it no longer receives updates or security fixes.

**Key Differences Between Python 2 and Python 3**

|  |  |  |
| --- | --- | --- |
| **Aspect** | **Python 2** | **Python 3** |
| **Release Date** | 2000 | 2008 |
| **End of Life** | January 1, 2020 | Actively maintained |
| **Print Statement** | print "Hello" (without parentheses) | print("Hello") (as a function) |
| **Integer Division** | 3 / 2 = 1 (integer division by default) | 3 / 2 = 1.5 (true division) |
| **Unicode Support** | Strings are ASCII by default (str) | Strings are Unicode by default (str) |
| **xrange vs range** | xrange() for memory-efficient loops | range() behaves like xrange (lazy eval) |
| **Error Handling** | except Exception, e: | except Exception as e: |
| **Input Function** | raw\_input() for strings, input() for eval | input() for strings |
| **Libraries** | Many new libraries are **Python 3 only** | Full support for modern libraries |