PRE LAB:-

1.How can you convert Python strings to character pointers in C?

2.How does Python handle memory management when dealing with character pointers passed from C?

3. Explain how you would handle null-terminated strings when working with character pointers in Python.

4. How do you handle encoding and decoding issues when dealing with character pointers in Python-C interfacing?

5. Discuss the differences in string handling between Python and languages that heavily rely on character pointers, like C?

Answers:-

1.Converting Python Strings to Character Pointers in C: Use Python's C API function PyBytes_AsString(PyObject *obj) to obtain a pointer to a null-terminated C string from a Python bytes object.

2.Python Memory Management with Character Pointers: Python manages memory for objects and handles the deallocation of memory when Python objects are no longer in use, including those converted from C character pointers.

3.Handling Null-Terminated Strings: Convert Python strings to C-compatible null-terminated strings using PyBytes_AsString and ensure proper management of the null terminator in C code.

4.Encoding and Decoding Issues: Use PyUnicode_AsUTF8 for encoding Python strings to C strings and PyUnicode_Decode to decode C strings to Python Unicode objects, handling different encodings explicitly.

5.String Handling Differences: Python strings are immutable and managed automatically, while C strings are mutable and require manual memory management and null-termination handling.

VIVA :-

1.**What is Python, and What Are Some of Its Key Features?**

Python is a high-level, interpreted programming language known for its readability and simplicity. Key features include dynamic typing, automatic memory management, a large standard library, and support for multiple programming paradigms (procedural, object-oriented, and functional).

2.**Differentiate Between Python 2.x and Python 3.x Versions?**

Python 2.x uses print statements (print "Hello"), integer division truncates results (5 / 2 = 2), and xrange() for ranges. Python 3.x uses print functions (print("Hello")), true division (5 / 2 = 2.5), and range() for ranges, and has improved Unicode support.

3.**Explain the Differences Between Lists and Tuples in Python**?

Lists are mutable, meaning their elements can be changed after creation, and are defined with square brackets ([1, 2, 3]). Tuples are immutable, meaning they cannot be changed, and are defined with parentheses ((1, 2, 3)).

4.**What Are the Advantages of Using Python for Web Development?**

Python offers ease of learning and use, a rich ecosystem of frameworks (like Django and Flask), and extensive libraries that streamline web development, as well as strong support for integrating with other technologies and tools.

5.**Describe the Concept of PEP 8 and Its Significance in Python Programming**?

PEP 8 is the Python Enhancement Proposal that provides guidelines for writing readable and consistent Python code, covering naming conventions, code layout, and style. It helps improve code quality and maintainability across projects.