**Report: Extraction of Neighbour Cell Information from XML and CSV Generation**

**Title:**

**Automated Extraction of 5G NR Neighbour Cell Information Using Python from XML Data**

**1. Objective**

To automate the process of extracting **Neighbour Cell Information** from a 5G NR XML configuration file and generate a well-structured CSV report. This data is essential for optimizing handover processes and improving network performance through effective neighbor cell planning.

**2. Tools and Technologies Used**

| **Tool/Technology** | **Purpose** |
| --- | --- |
| Python 3.x | Programming language for scripting |
| xml.etree.ElementTree | Parsing XML |
| pandas | Data formatting and CSV output |
| Excel | Final tabular viewing and analysis |

**3. Input Description**

The input file is an XML document containing 5G NR site configuration data, including both home and neighbor cell relationships. The data was nested under multiple elements related to gNodeBs and cells.

**4. Data Extracted**

The following fields were extracted:

* home\_gNB – The global nodeB ID of the home gNodeB.
* gNB Name – Identifier or label of the gNodeB (e.g., 5G-HPE00).
* Home Cell – Cell name/identifier within the home gNB (e.g., NR\_63408).
* Neighbour Cell Info – Unique identifier for each neighbor cell linked to the home cell (e.g., auto358497709).

**5. Methodology**

**a. XML Parsing**

* Parsed the XML structure using ElementTree.
* Traversed through each node containing home and neighbor cell mapping.
* Extracted nested attributes/tags with conditional logic to ensure data integrity.

**b. Data Structuring**

* Collected the extracted values into dictionaries and appended them into a list.
* Converted the list into a DataFrame using pandas for structured CSV generation.

**c. CSV Generation**

* Created a file named 5G\_NR\_Neighbour\_Cells.csv containing all records.
* Fields included: home\_gNB, gNB Name, Home Cell, Neighbour Cell Info.

**6. Challenges Faced**

* Parsing deeply nested XML with sibling relationships (Home Cell ↔ Neighbor Cell).
* Ensuring uniqueness and correctness in identifying relationships.
* Formatting the output CSV with correct encoding and column names.

**7. Benefits of the Solution**

* **Time-Saving**: Automates neighbor cell mapping which is usually tedious manually.
* **Accurate Planning**: Assists in handover and neighbor optimization strategies.
* **Reusable Script**: Can be reused with minor changes for different XML structures.

**8. Conclusion**

The script efficiently extracted and organized 5G NR neighbor cell mapping information from XML into a clean, readable CSV format. The results can now be used for further analysis in Excel or imported into network planning tools.