Team Members :

- *Name* : عماد الدين عادل محمود رزق
- *ID* : 200650

- *Name* : عمر عبد العزيز محمود التراس
- *ID* : 2000632

- *Name* : محمد احمد عطيه عثمان
- *ID* : 2000682

Python Code Scanner

- This Python project is a simple lexical analyzer (or tokenizer) that scans Python code input and outputs individual tokens. Each token is classified according to its type, such as keywords, identifiers, numbers, strings, operators, comments, and whitespace. This tool can help with understanding how a Python program is structured by breaking it down into these basic elements.

Features

- **Tokenizes Python Code**: The scanner takes C Programming code as input and identifies all tokens within it.

- Token Types Supported

  :

  - **Keywords**: Recognizes Python keywords (e.g., `def`, `return`, `if`, `else`).
  - **Identifiers**: Recognizes variable and function names.
  - **Numbers**: Detects integer values.
  - **Strings**: Detects strings enclosed in single or double quotes.
  - **Operators**: Recognizes standard Python operators (e.g., `+`, `-`, `*`, `/`, `==`, `!=`).
  - **Comments**: Identifies comments beginning with `#`.
  - **Whitespace**: Skips whitespace but keeps it for structural integrity.

- **Regex-Based Scanning**: Uses regular expressions to define and match each token type.

How It Works

The program utilizes Python's `re` (regular expression) module to define token types using patterns. It then scans the input code and matches each pattern to identify token types, ignoring whitespace for readability.

Example

```
c_code = """
// A simple addition
int add(int a, int b) {
    return a + b;
}
"""
```

Expected Output

```
('COMMENT', '# This is a comment')
('KEYWORD', 'def')
('IDENTIFIER', 'add')
('SPECIAL_CHAR', '(')
('IDENTIFIER', 'x')
('SPECIAL_CHAR', ',')
('IDENTIFIER', 'y')
('SPECIAL_CHAR', ')')
('OPERATOR', ':')
('KEYWORD', 'return')
('IDENTIFIER', 'x')
('OPERATOR', '+')
('IDENTIFIER', 'y')
```

Usage

1. **Clone the Repository**:

```
git clone https://github.com/your-username/python-code-scanner.git
cd python-code-scanner
```

2. **Run the Program**:

- Run the code in the terminal:

```
python scanner.py
```