**C Tokens**

A token is the smallest element of a program that is meaningful to a compiler. Tokens can be classified as follows:

1. Keywords
2. Identifiers
3. Constants
4. Strings
5. Special symbols
6. Operators

1. **Keywords:** keywords are pre-defined or reserved words in programing language. Each keyword is meant to perform a specific function in a program. Key words example:

int, double, for, if, char, switch, float, return, void, unsigned, const, continue ……

1. **Identifiers:** identifiers are used for naming variables, functions and arrays. They are user-defined names. You cannot use a keyword as identifiers. Once declared, you can use the identifier in later program statements to refer to the associated value.

For example: int input1 = 5; char a = ‘a’; both input1 and a are identifiers

1. **Constants:** constants are also like normal variable. But the only difference is, their values cannot be modified by the program once they are defined.

For example: const double PI = 3.145;

1. **Strings:** strings are an array of characters. Strings are always enclosed in double-quotes.

For example: char name[10] = “Pawlos”;

**5.Special Symbols:**The following special symbols are used in C having some special meaning and thus, cannot be used for some other purpose. [] () {}, ; \* = # 

* **Brackets []:** Opening and closing brackets are used as array element reference. These indicate single and multidimensional subscripts.
* **Parentheses ():**These special symbols are used to indicate function calls and function parameters.
* **Braces {}:** These opening and ending curly braces mark the start and end of a block of code containing more than one executable statement.
* **Comma (, ):**It is used to separate more than one statements like for separating parameters in function calls.
* **Colon (:):** It is an operator that essentially invokes something called an initialization list.
* **Semicolon (;):** It is known as a statement terminator.  It indicates the end of one logical entity. That’s why each individual statement must be ended with a semicolon.
* **Asterisk (\*):**It is used to create a pointer variable and  for the multiplication of variables.
* **Assignment operator (=):**It is used to assign values and for the logical operation validation.
* **Pre-processor (#):**The preprocessor is a macro processor that is used automatically by the compiler to transform your program before actual compilation.

**6.Operators:**Operators are symbols that trigger an action when applied to C variables and other objects. The data items on which operators act upon are called operands.   
Depending on the number of operands that an operator can act upon, operators can be classified as follows: 

* **Unary Operators:** Those operators that require only a single operand to act upon are known as unary operators. For example, increment and decrement operators
* **Binary Operators:** Those operators that require two operands to act upon are called binary operators.**Binary operators are classified into:**
  1. Arithmetic operators (+, -, \*, /)
  2. Relational Operators (==, >, <, <=, >=)
  3. Logical Operators (AND, OR, NOT)
  4. Assignment Operators (=)
  5. Bitwise Operator
* **Ternary Operator**: The operator that require three operands to act upon are called ternary operator. Conditional Operator(?) is also called ternary operator.   
  **Syntax**: (Expression1)? expression2: expression3;

Exercise:

* 1. What is the operator ‘=’ used for?
  2. create an integer variable num\_1 = 5, num\_2 = 4000, a = 8, b = 89
  3. crate a double variable length = 9.89, weight = 5.78, n = 0.0001, c = 789.0
  4. crate a character variable a = ‘a’, B = ‘B’, z = ‘z’, p = ‘P’
  5. How do you make a new line?
  6. crate three examples of variables for integers, double and characters
  7. what is the formatting for integers? What is formatting for double? What is the formatting for characters?
  8. Write a program that crates three integers and print them
  9. Write a program that crates three double values and print them
  10. Write a program that crates three characters and print them
  11. Write a simple program that print “My name is (your name)”
  12. Write a program that crates two integers and print their sum
  13. Write a program that crates two doubles and print their multiplication