C Constants

- A constant value is the one which does not change during the execution of a program.
- Constants are classified as shown in the picture.

**Integer Constant:**
- An integer constant must have at least one digit.
- It can be either positive or negative. If no sign precedes then it is assumed to be positive (unsigned).
- No decimal point, commas or blanks are allowed in an integer constant.
- The range of integer constant depends upon the compiler. For a 16 bit compiler like Turbo C or Turbo C++, the range is -32768 to 32767.
- Example: 100, -200, +500.
- If an integer is too big to fit in an integer range then it will taken as a long. A long constant is written with a terminal l (or) L. Example **123456789L**.
- **Unsigned constants** are written with a terminal u (or) U.
- **Unsigned long constants** are written with a terminal ul (or) UL.
- The value of an integer can be specified in octal or hexadecimal instead of decimal. A leading 0 (zero) on an integer constant means octal. A leading 0x (or) 0X on an integer constant means hexadecimal.
- For example, decimal 32 can be written as 040 in octal and 0x20 in hexadecimal.
- unsigned(u) and long(l) can also be applied to octal and hexadecimal constants. For example **0xFUL** is an unsigned long constant with decimal value 15.

**Real Constant (or) Floating Point Constant**
- A real constant must have at least one digit.
- It must have a decimal point. No commas or blanks are allowed.
• It could be either positive or negative. Default sign is positive.
• It can be written in a **fractional form** (123.4) or an **exponential form** (1e-2). In exponential form the part appearing before 'e' is called **mantissa** and the part following 'e' is called **exponent**.
• The suffixes f (or) F indicate a float constant. l or L indicate a long double.
• **Example:** +123.45, 500.0, -300.25, 10e-5, -200e-25

**Character Constant**
• A character constant is an integer, written as a single alphabet, a single digit or a single special symbol enclosed within single quotes.
• Example 'A', '5', 'z', '='
• The value of a character constant is the numeric value of the character in the machines character set.
• The maximum length of a character constant can be 1 character.
• Escape sequences are character constants. They look like 2 characters but they are single character only. Example: \n -> newline and \t -> horizontal tab

**String Constant**
• Sequence of 0 or more characters surrounded by double quotes
• Example "I am a String", empty string " "
• The double quotes are not part of the string but used to delimit the string
• String constants can be concatenated at compile time. For example "hello" "world" is equivalent to "hello world". This is useful for splitting long strings across several source lines.
• The string constant is an array of characters. The internal representation of a string has a null character '\0' at the end.
• strlen() function returns the number of characters in a string excluding '\0'

**Enumeration Constant**
• An enumeration is a list of constant integer values. Example: enum bool{yes,no};
• The first name in an enum has value 0, the next one has 1 and so on unless explicit values are specified.
• If not all the values are specified, unspecified values continue the value from the last specified value.
• Enumeration provide a convenient way to associate constant values with names.
• Enumeration is an alternative to #define. In enum the values automatically defined and easy to define large number of constants

Source:
http://datastructuresprogramming.blogspot.in/2010/02/c-constants.html