**Introduction to programming Languages**

**Constants**: These are the entities whose value will not change during the processing are known as constants. Constants are used to provide input data in arithmetic expressions or in logical expressions. Constants are categorized into

1. Numeric constant
2. Single character constant
3. String constant.
4. **Numeric constant**: All the numbers are treated as numeric constants which can be used as arithmetic calculations. These constants are formed with the help of 0 to 9 digits +- sign and decimal point. If the sign is used it must be the first character if the decimal point is used it must be the last character. Numeric constants are further categorized into integer constants (Number having only integer part), Real constants (Number having fractions).
5. **Single character constant**: A single character enclosed in single coats is known as Single character constants. These constants can have any character which can be represent able from the keyboard. Single character constants represent able in the memory with the help of Unicode known as ACII code. Every standard keyboard will generate 256 key combinations which are represented by ASCII code 0 to 256.

**A-65 a-97 0-48**

**B-66 b-98 1-49**

**C-67 c-99 2-50**

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**Z-90 z-122 9-57**

1. **String constants:** Two or more character enclosed in double coats is known as String constants which cannot be used for arithmetic calculations. These constants can have any character which can be represent able from the keyboard two or more strings can be joined which is known as string concatenation.

**Variables:** These are the location in memory were the actual information is stored. Value of the memory location may vary during processing hence are known as variable. Every location in memory must be identified by unique and meaningful name known as variable name. Variable names are:

1. A name can have A-Z, a-z alphabets, 0-9 numbers and underscore.
2. Name must begin with an alphabet maximum of 8 character are specified.
3. Language keywords must not be used as variable names.

**Note:**

1. Language keywords are preserved words which has specific meaning to the compiler name they must not be used as variable name.
2. Every variable which is used in program needs to declare at the beginning of the program with the help of data types.
3. Variable must not be declared in loop because multiple declarations are not allowed.

**Data types:** Data type indicates the type of data stored in the variable and number of bytes preserved. Most of the programming languages provides the following data types.

1. int (Integer)
2. float
3. double
4. char(Character)
5. **int (Integer):** Integer data type will allow to store only +ve or -ve Integer which can be used for arithmetic calculations.
6. **Float:** Float will reserve 4 bytes of memory to store real numbers with fractions.
7. **Double:** Double will reserve 8 bytes of memory to store very large real numbers. Large real number is stored in the form of specific format.
8. **Char(Character):** It will reserve 1 byte of memory to store single character along with the character data type sign modified signed or unsigned can be specified. Even the character data type internally stores integer value because character constants are represented using ACII value.

**Signed char:** 2^7 (Sign will be stored) -2^7 to 2^7-1.

**Unsigned char:** 1 byte 2^7 (Sign will not be store). 0 to 2^7 + 2^7-1

0 to 127 + 128.

255.

**Defining and Initializing variables:**

Syntax:

<data type> <variable>;

Example: int x;

Where x = variable name.

int = data type.

x

Value will be undefined

65240 = some memory adress