Class:- A class is a blueprint or prototype for creating different objects which defines its properties and behaviours . A class thus defines a data type that behaves like the built-in type or predefine type of programming language so it is also called abstract data type.

Syntax of class Example of class

class abc

{

int a;

void av()

{

System.out.print(“test”);

}

class (name of class)

{

Data:

Function:

}

Methods:- A methods is a function or procedures that access to the internal states of the objects to perform same operation.

Objects:-Objects are the basic runtime entities in an object oriented system. They may represent a person, a place, a bank a/c or any item that the program has to handle. It is also known as class variable or instance variable.

Data abstraction:- Abstraction refers to the act of representing essential features without including the background details.

**Data hiding:-** The insulation of the data from direct access by the program is called information hiding or data hiding.

Encapsulation: The wrapping up of data and function into a single unit called is known as encapsulation.

**Inheritance:-**Inheritance is the process by which objects of one class acquire the property to another class. In oop, the concepts of inheritance provide code reusability.

Polymorphism:-Polymorphism is another property in an oop concept. “polymorphism” a Greek terms means the ability to take more the one form . it is also express as one interface, multiple methods. It is basically refers to the ability of giving the same name to methods in different subclass.

Shape

Area()

Square

Area(square)

Circle

Area()

Rectangle

Area(rect)

**Dynamic binding:-**Binding refers to the linking of a procedure to the call. Dynamic binding also known as late binding means that the code associated with a given procedure call is not known until the time of call at runtime.

Application of java/c++

* Real time system
* Object oriented database
* AI and expert system and etc.

Tokens: The smallest individual units in a program are known as tokens

C++/java has the following tokens

* Keywords
* Identifiers
* Constants
* Strings
* Operators

Keywords:-The keywords or reserved words are one which have a special and predefined meaning to the java/c++ compiler. There are 48 keywords present like if, int, float, class, public, void and etc.

Identifiers:-Identifiers refers to the name of variables, Function, Arrays, Class and etc created by the programmer

Rule of identifiers :

* Variable/class/function etc must be begin with a letter, a dollar symbol ($) or an underscore, which may be followed by a sequence of letters or digit (1,2,etc), $, ”\_” .
* Variable names must be unique.
* There should be no space in between any two characters of an identifier.
* They can be of any length.
* Keywords cannot be used for variable name.
* Java is case-sensitive, so upper case and lower case letters are distinct.

**Invalid variables name:**

* 47123 : cannot begin with digit
* #phone : The special character “#” is not allowed
* Total Hour : blank space between l and H
* Basic ,pay : ‘,’ is not allowed
* if : reserved word are not allowed as an identifiers

**Data type:-**Data types are used to specify the type of data a variable can contain

**Types of data type:-**

Data type

Primitive DT

Non-primitive DT

class

void

Array

Non-numeric

Numeric

String

Floating point

Integer

Interface

Char

Float

byte

short

Double

int

long

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **Size in memory** | **Range** | **Description** | **Default Value** |
| **byte** | 8-bits=**1-byte** | **-128 to +127** | For smallest integer | 0 |
| **short** | 16-bits=**2-byte** | -32768 to +32767 |  | 0 |
| **int** | 32-bits=**4-byte** | -231 to 231-1 | Most commonly used integer | 0 |
| **long** | 64-bits=**8-byte** | -263 to 263-1 | Long integer | 0L |
| **char** | 16-bits=**2-byte** | 0 to 65535 | A single character | ‘\u0000’ |
| **float** | 32-bits=**4-byte** | -3.4 E38 to 3.4 E38 | Single precision  Floating point number | 0.0f |
| **Double** | 64-bits=**8-byte** | -1.7 E308 to 1.7 E308 | Double precision  Floating point number | 0.0d |

Operators:

An Operator is a symbol that is used in programs to compute values.

Types of operators

1. Unary operator
2. Binary/ Arithmetical operator
3. Assignment operator
4. Relational operator
5. Logical operator
6. Shift operator
7. Bitwise operator
8. Conditional operator
9. New operator