**JAVA**

Getting Started with Java

DAY-1:

* What is Java?

Java is a OOPs programming language that has many advantages.

**Importance** of core java:-

3 billion devices run on the java language only.

1) Java is used to develop Desktop Applications such as Media Player, Antivirus etc.

2) Java is Used to Develop Web Applications such as sravyajobs.com, irctc.co.in etc.

3) Java is Used to Develop Enterprise Application such as Banking applications.

4) Java is Used to Develop Mobile Applications.

5) Java is Used to Develop Embedded System.

6) Java is Used to Develop Smart Cards.

7) Java is Used to Develop Robotics.

8) Java is used to Develop Games …………………… etc.

**Features**: Important features of Java are- Object Oriented, Platform Independent, Simple, Secure, Architecture-neutral, Portable, Robust, Multithreaded, Interpreted, Distributed.





* The Java Platform

**Architecture:**



**Technologies Depends on Core java:-**



* • Obtaining Java
* ***Install the software and set the path :-***
* *1) Download the software.*
* *2) Install the software in your machine.*
* *3) Set the environmental variable.*
* Download the software from internet based on your operating system. The software is different
* from 32-bit operating and 64-bit operating system.
* To download the software open the fallowing web site.
* http://www.oracle.com/technetwork/java/javase/downloads/jdk7-downloads-1880260.html
* for 32-bit operating system please click on
* Windows x86 :- 32- bit operating system
* for 64-bit operating system please click on
* Windows x64 :- 64-bit operating system
* After installing the software the java folder is available in the fallowing location
* Local Disk c: ------program Files--------java----jdk(java development kit),jre(java
* runtime environment)
* **To set the environmental variable:-**
* My Computer (right click on that) ---->properties----->Advanced--->Environment Variables---->
* User variables--new---->variable name : Path
* Variable value: C:\programfiles\java\jdk1.6.0\_11\bin;.;
* -------ok------ok
* • Editions and Versions of Java

**JAVA VERSIONS:-**

***VERSION YEAR***

Java Alpha & beta : 1995

JDK 1.0 : 1996

JDK1.1 : 1997

J2SE 1.2 : 1998

J2SE 1.3 : 2000

J2SE 1.4 : 2002

J2SE 1.5 : 2004

JAVA SE 6 : 2006

JAVA SE 7 : 2011

* + 1. JAVA SE 8 : 2014
* • Java History

Java programming language was originally developed by Sun Microsystems which was initiated by James Gosling and released in 1995 as core component of Sun Microsystems' Java platform (Java 1.0 [J2SE]).

* • The JDK
  1. Java Runtime Environment
* • Your First Java Program (Note Pad)
* ---------------------------------------------Day-1 End------------------------------------------------------------

DAY-2:

* • Revisiting the JVM
  + 1. JVM Architecture:
* • API documentation

Oracle API docs

**API documentation** is a technical content deliverable, containing instructions about how to effectively use and integrate with an **API**

* • Your First Java Program (IDE)

---------------------------------------------Day-2 End------------------------------------------------------------

DAY-3:

Java Syntax

Class, Method, Variable

* Coding standards
* Valid Identifiers
* Scope

Object Oriented Programming in Java

* Creating (Instantiating) Objects
* Stack and Heap
* Using Objects
* Initializing Data
* Creating Object Types
* Building Constructors
* Default Constructor
* Working Example

---------------------DAY 3 END ------------------------------

Conventions & Primitives

* • Comments
* • Primitive Data Types
* • Primitive Literals
* • Primitive Conversion , type casting
* • Objects vs. Primitives
* Assignments and Operators
  + 1. Incre/Decre, Arithmetic, String Concat(+), Relational, Equality, Instance of, bitwise operator, Boolean Complement, Short circuite, assignment operator(Compound assignment), Conditional operator, new vs newInstance()
* ---------------------DAY 4 END ------------------------------
* • Enums
* • Conditionals
* • Loops
* • Break, Continue, and Labels

---------------------DAY 5 END ------------------------------

Strings

* String Objects
* String Constant Pool vs Heap Area
* String vs StringBuffer
* Immutable Strings
* Immutable and Mutable
* String Operations and Operators
* equals() and toString()
* == vs .equals
* compareTo()
* length()
* ***charAt(int) & split() & trim()***
* ***StringBuffer vs StringBuilder***
* ***StringTokenozer***

---------------------------------------------Day-6 End------------------------------------------------------------

Arrays

* • Arrays
* • Multi-Dimensional Arrays
* • For-Each
* • Sorting and Searching Arrays
* • Common Array Mistakes

---------------------------------------------Day-7 End------------------------------------------------------------

Packaging

* • Packages
* • Classpath
* • Java Archive (JAR)

Static

* Class vs. Object
* Static Variables
* Static Method
* Static Initialization Block
* instance Initialization Block
* “this” Keyword
* Garbage Collection (GC)
* Java Memory Leaks
* • Varargs

Primitive variables:

Primitive variables can be used to represent primitive values.

Example: int x=10;

Reference variables:

Reference variables can be used to refer objects.

Example: Student s=new Student();

**Based on the behavior and position of declaration all variables are divided**

**into the following 3 types.**

**1. Instance variables**

**2. Static variables**

**3. Local variables**

Instance variables:

* If the value of a variable is varied from object to object such type of variables are
* called instance variables.
* For every object a separate copy of instance variables will be created.
* Instance variables will be created at the time of object creation and destroyed at

the time of object destruction hence the scope of instance variables is exactly

same as scope of objects.

* Instance variables will be stored on the heap as the part of object.
* Instance variables should be declared with in the class directly but outside of any

method or block or constructor.

* Instance variables can be accessed directly from Instance area. But cannot be

accessed directly from static area.

But by using object reference we can access instance variables from static area

* Keywords:

***source-file:***

*class*

*extends*

*interface*

*implements*

*package*

*import*

**Data Types**

*byte*

*short*

*int*

*long*

*float*

*double*

*char*

*boolean*

* ***method-level:-***
* void
* return

***Flow-Control:-***

*if*

*else*

*switch*

*case*

*default*

*break*

*for*

*while*

*do*

* *continue*
* ***Object-level:-***
* *new*
* *this*
* *super*
* *instanceof*

---------------------------------------------Day-8 End------------------------------------------------------------

# OOPS: Object Oriented Programming Structure

Encapsulation & Data Hiding

* • Encapsulation & Data Hiding
* • Accessors/Mutators or Getters/Setters
* • Access Modifiers
* • Encapsulation/Data Hiding Resources

---------------------------------------------Day-9 End------------------------------------------------------------

Min Max elements of an Array

Linear Search

Binary Search

Fibonacci series

Swapping of Integers and Strings with and without third variable

---------------------------------------------Day-10 End------------------------------------------------------------

Inheritance

* Chaining Constructors
  1. IS-A and HAS-A -🡪 IS-A ---Using Extends; Has-A🡪 no specific keyword; -- Composition, Aggregation
* Overriding Methods and Revisiting the Super Reference
* The Three Faces of Final
  + - 1. – Final Keyword

– class level –which stops Inherit the class

--- Method level – which stops Overriding

--- instance level -Final variables cannot be overriden

---------------------------------------------Day-11 End------------------------------------------------------------

Abstract Classes and Interfaces

* Abstract Classes
* Interfaces
* Inheritance in Interfaces
* Revisiting Overriding Methods: Covariant Returns
* Marker Interface
* Adaptor Classes

---------------------------------------------Day-12 End------------------------------------------------------------

Pillars of OOPs: Encapsulation , Inheritance, and Polymorphism

Inheritance – Reusability

Encapsulation – Security

Polymorphism - Flexibility

Polymorphism

* • Polymorphism - Many forms – one name – many forms;
  + 1. Ex: Friendship: to start/to end based on the behavior
    2. Types: Compile time == Overloading, Method Hiding – Compile time / Static / early binding

Runtime == Overriding – Runtime / Dynamic / late binding

Overloading 🡪 Two methods with same name

* • Benefits of Polymorphism
* • Object Type Casting
* • The Object Class
* Overloading Methods

---------------------------------------------Day-13 End------------------------------------------------------------

Exception Handling

* • Throwable
* • Catching Exceptions
* • Finally block
* • The Exception Object
* • Runtime vs. Checked Exceptions
* • Creating Exceptions

**1. Introduction**

**2. Runtime stack mechanism**

**3. Default exception handling in java**

**4. Exception hierarchy**

**Object🡪 Throwable🡪Exception/Error**

**5. Customized exception handling by try catch**

**try-catch-finally-throw-throws**

**6. Control flow in try catch**

**7. Methods to print exception information**

**8. Try with multiple catch blocks**

**9. Finally**

**10. Difference between final, finally, finalize**

**11. Control flow in try catch finally**

**12. Control flow in nested try catch finally**

**13. Various possible combinations of try catch finally**

**14. throw keyword**

**15. throws keyword**

**16. Exception handling keywords summary**

**17. Various possible compile time errors in exception handling**

**18. Customized exceptions**

**19. Top-10 exceptions**

**20. 1.7 Version Enhancements**

**1. try with resources**

**2. multi catch block**

**21. Exception Propagation**

**22. Rethrowing an Exception**

# Java8

Features

Lambda Expressions and Static Imports

* • Marker and Functional Interfaces
* • Lambda Expressions
* • Predicate
* • Static Imports

Collections

* • When arrays are not enough
* • Collections
* • The Collection Interface
* • Iterator
* • Lists
* • Sets
* • Queue
* • ArrayBlockingQueue
* • PriorityQueue
* • Deque
* • ArrayDeque
* • Maps
* • HashMap

Working with Collections and Arrays

* • Limitations of Collections
* • Generics and Autoboxing
* • Diamond Operator
* • Sorting and Searching Arrays and Collections
* • Comparable
* • Comparator

Appendix A – JDBC

* • Why JDBC?
* • Driver Manager
* • Connections
* • Statements
* • Inserting Rows
* • Updating Rows
* • Deleting Rows
* • Other Modifying Statements
* • Result Set
* • Mapping Between SQL & Java Data Types
* • PreparedStatement
* • CallableStatement
* • SQLException
* • Metadata
* • Datasource

Appendix B - Java GUI

* • Java Foundation Classes (JFC)
* • Top Level Containers
* • Components
* • Layout Management
* • BorderLayout
* • FlowLayout
* • BoxLayout
* • Event Handling
* • Adapters