# **JAVA INTERVIEW QUESTIONS**

**Q) What is Java?**

A) Java is object-oriented programming language that produces software for multiple platforms. Java is used to develop desktop and web app. Some of the Real time application that are developed using java are Amazon, Netflix, Google Earth. Java is a platform-independent programming language used to create secure and robust application that may run on a single computer or may be distributed among servers and clients over a network.

**Q) What is JVM?**

A) The Java virtual machine (JVM) is a software implementation of a computer that executes programs like a real machine. The Java virtual machine is written specifically for a specific operating system, e.g. for Linux a special implementation is required as well as for Windows. Java programs are compiled by the Java compiler into bytecode. The Java virtual machine interprets this bytecode and executes the Java program

**Q) What is JRE?**

A) The Java runtime environment (JRE) consists of the JVM and the Java class libraries and contains the necessary functionality to start Java programs. The JDK contains in addition the development tools necessary to create Java programs. The JDK consists therefore of a Java compiler, the Java virtual machine, and the Java class libraries.

**Q) What is class?**

A) Class contains data members and member functions i.e. variables and methods. It is a blueprint or template which is used to create the object.­­­

public class helloWorld {

public static void main(String []args)

{

System.out.println("Hello world");

}

**Q) What is Object?**

A) An object is copy of a class which can access data members and member functions of class.

**Syntax**: ClassName objectname = new ClassName();

**Q) what is Methods?**

A) A method is a block of code which perform specific operation. A class can contain many methods. There are 4 types of methods .

1. method with argument and return.

2. method without argument and without return.

3.method with argument and without return.

4.method without argument and with return.

**Syntax: 1. Public ReturnType methodName (arguments,…)**

**2. public void methodName()**

**3.public void methodName(arguments,…)**

**4. public ReturnType methodName()**

**Program: write a program to create method with 1) with return ,with argu 2)with return , without argu 3)without return , with argu 4)without return , without argu.**

**Q) what is a Constructor:**

A) It is a special method. The name of method should be only class name .it does not have any return type. It is used to create an object. Constructor can be overloaded but cant be overridden. Constructor can be called only once throughout an object life cycle.

**Syntax:** public ClassName() { }

# Polymorphism

**Q) what is Polymorphism?**

A) Polymorphism means having many forms.it can be performed a single action in different ways.

**Q) What are types of polymorphism**?

There are two types of polymorphism:

COMPILE TIME polymorphism And RUN TIME polymorphism.

* Compile time polymorphism is also known as static binding / early binding / method overload which means a class has same method name but different signature(arguments), they are differed by no. of arguments, types of arguments, order of arguments.
* Run time polymorphism is also known as dynamic binding / late binding / method overriding which means when a class is inherited the sub-class/child class has the same method name with same arguments of super-class/parent class.

Program:1) write a program for method overloading ?

2) write a program for method overriding ?

# Encapsulation

**Q) what is Encapsulation?**

A) Encapsulation is the process of wrapping the data and code together in a single unit .

EX: class.

**Q) what is data hiding?**

A) if a field is declared private in the class then it cannot be accessed by anyone outside the class and hides the fields within the class. Therefore, Encapsulation is also called data hiding

# Abstraction

**Q) what is Abstraction?**

A) Abstraction is a process of hiding the implementation details and showing the functionality. We achieve this using Encapsulation.

**Q)** **How to achieve or implement Abstraction in Java?**

**A)** There are two ways to implement abstraction in java. They are as follows:

a) Abstract class   
b) Interface

**Q) what is Abstract Class?**

**A)**  An abstract class in java is a class that is declared with an abstract keyword. It has atleast one abstract method.

**Syntax**: abstract class Test { abstract void show(); }

Q) **What is Abstract method in Java?**

**A)**  A method which is declared with abstract modifier and has no implementation (means no body) is called abstract method in java.

Syntax: abstract returnType methodName(parameterList);

**Q) what is Interface?**

**A)**

1. Interface is used to declare a special type of class that only contains abstract method.
2. To access the interface methods, the interface must be implemented by class by using keyword called “implements” .

Syntax: Interface interfacename{ }

# Inheritance

**Q) what is Inheritance?**

**A)**

1. Inheritance is a mechanism in which one class acquires the properties and behavior of another class i.e. parent class/super class to child class/sub class.
2. It represents the IS-A-RELATIONSHIP. It is used for reusability of code by using the key word “extends” .

**Q) what are the type of Inheritance?**

A) There are 4 types of inheritance: SINGLE, MULTIPLE, MULTI-LEVEL, HYBRID.

Single Inheritance: It inherits from one class to another class

Class B

Class A

Multiple Inheritance: It inherits two or more classes at the same time. It does not support by java

Class A

Class B

Class C

Muti-Level Inheritance: It is the chain of inheritance.

Class A

Class B

Class C

Hybrid Inheritance: It is the combination of single inheritance and multiple inheritance.

Class A

Class B

Class C

Class D

**Q) Difference between Interface v/s Class?**

**A)**

|  |  |
| --- | --- |
| Interface | Class |
| Object cannot be created by interface, as it contains all abstract methods i.e. which has no logic or body. | Object can be created for class, as it contains non abstract methods i.e. which has logic or body. |
| Memory cannot be created for an interface class. | Memory can be created for a class. |
| Can support multiple inheritance. | Cannot support multiple. |
| Interface can extends as many interfaces as needed. | Class can extends only one class at a time but can implement as many no.of interface as needed |

**Q) Difference between Interface v/s Abstract class?**

**A)**

|  |  |
| --- | --- |
| Interface | Abstract class |
| Interface class contains only abstract methods and abstract static methods. | Abstract class contains abstract methods and non-abstract methods i.e. no logic. |
| “implements” is the keyword for interface. | “Extends” is the keyword for abstract class. |
| It supports multiple inheritance. | It doesn’t support multiple inheritance. |
| Supports final, non-final, static, non-static variables | Supports only static and final variables |

**Q) Difference between Abstract class v/s Class?**

|  |  |
| --- | --- |
| Abstract class | Class |
| Abstract class contains abstract methods and non-abstract methods i.e. which has no body or logic. | Class contains only non-abstract methods i.e. which has logic in it. |
| “Abstract” is used when there is at least one abstract method. | “class” is used when there is no abstract methods. |
| Object can’t be created. | Object can be created. |
| If abstract class is extended to another class but not implemented the abstract methods, then child class/sub class should also be named as abstract. | If class is extended to another class , subclass/child class there is no need of keyword . |

# KEYWORDS

**Q) what is Access Modifier:**

A) To keep the data safe and secure we use access modifier.

Types of access modifier:

PUBLIC, PRIVATE, DEFAULT, PROTECTED, FINAL.

|  |  |  |  |
| --- | --- | --- | --- |
| PUBLIC | PRIVATE | DEFAULT | PROTECTED |
| The data members and member functions is accessed any where in java. | The data members and member functions is accessed with in class. | The data members and member functions is accessed with in package. | The data members and member functions which is inherited/ IS-A RELATION it is accessed within child class. |

**Q) what is Static keyword?**

1. It is a keyword , it is used to refer to the common property of all object.
2. Memory is created in Global memory.
3. Static keyword is mainly used for memory management.
4. Static can give variables and methods.

**Q) what is Final keyword?**

A)It is a keyword, it is used to restrict changing the data by the user. It can be used for variables(must be initialized), Class, and Methods.

|  |  |
| --- | --- |
| For Variables | Used to not to change the data. |
| For Class | Used to not to inheritance. |
| For Methods | Used to not to override. |

**Q) what is This keyword?**

It refers to the current object data. It is used when the same variables are used in global variables as well as in methods arguments, to get the global data this keyword is used.

**Q) what is Super keyword?**

It is used when there is overridden to get the parent class data to child class by using super keyword. It can get base class and base class methods.

**Q) what is Super( ) method?**

It is a reference variable that is used to refer parent class constructors only. Call to super() must be first statement in Derived Class constructor.

**Q) what is Abstract keyword?**

1. It is used to create abstract class and abstract methods.
2. Abstract class contains abstract methods and non- abstract methods.
3. If any one method is abstract method the class must be written as Abstract class, whereas abstract method contains no logic/ body in it.

**Q) Difference between Extends v/s Implements:**

|  |  |
| --- | --- |
| Extends | Implements |
| “Extends” is a keyword in which one class is inherited by another class. | “Implements” is a keyword in which a class is inherited by a interface class. |
| It is used when a class is inherited with another class. | It is used when a class is inherited with the interface class. |
| It only supports single inheritance and multi-level inheritance. | It supports multiple inheritance. |
| An interface can extend more than one interface. | An interface cannot implement another interface. |

**Q) what is a Compiler?**

1. A compiler is a translator that converts the high-level language into low-level machine language.
2. It helps to detects the errors in the code.

**Q) what is a Runner:**

1. It takes the converted files from compiler and sends to computer.

**Q) Define Data Type and its Type**?

A)Data type is that which classifies that a particular data is stored in a specific type. There are 3 categories: User data type, Primitive data type, and Derived data type.

|  |  |  |
| --- | --- | --- |
| Numerical | Characteristics | Boolean |
| * INTEGER:  1. Byte-1byte 2. Short-2 byte 3. Int-4 byte 4. Long-8 byte  * DECIMAL:  1. Float-4 byte (up to 6-digit) 2. Double-8 byte (up to16-digits) 3. Decimal-16 byte (up to 32-digits) | * Char-single character.[‘ ‘] * String-collection of two or more char.[“ “] | * True * False |

**Syntax: DataType variablename = value;**

**Q) what is a Variable and it’s Types?**

**A)**

1. Variable is a container which stores a data by a specific data type in respective memory space.
2. Types: Local variables, Instance variable, and Global variable.
3. Local variables: It is created inside the method within class and can be used within that method.
4. Instance variable: It is created inside a class which used in methods.
5. Global variable: It is used for entire class including all methods in the class and by using static it will be denoted as global variables.

**Q) what is Operator and it’s Types?**

**A)** An operator is a character that determine the actions to be performed. Types:

|  |  |
| --- | --- |
| 1. Arithmetic Operators | It is for the calculation purpose.{ +, -, \*, /, % } |
| 1. Relational operators | It is used for the comparison of two inputs and gives the Boolean as an output.{ == , =(assignment) , < , <= , > , >= , != } |
| 1. Logical Operators | It takes the Boolean input and gives the Boolean as output. { && , || , ^} |
| 1. Increment/Decrement   Operators | Post: after the variable[a++][a--]  Pre: before the variable[++a][--a]  Increment{ ++ }, Decrement{ -- } |
| 1. Assignment Operators | It is used to assign a data to a variable .Ex: int a=10; 10 is assigned to a variable.{ = , += , -= , \*= , /= , %= } |
| 1. Unary Operators | It is used only for one variable to decide a result. EX: +4; -8 { + , - , ~ , \* , / , ! } |
| 1. Bitwise Operators | It is based on Boolean [0,1]{ & , ! , ~ , >> , << } |
| 1. Ternary operators | It is used for conditional expression { ? , :} |

**Q) what is Control Flow Statement?**

A) It helps to control the flow of a program by few commands. Types: CONDITIONAL FLOW, LOOPING FLOW, JUMPING FLOW, SELECTION FLOW.

|  |  |
| --- | --- |
| 1. Conditional | It is based on True/False or Boolean data. Makes decision to do or not.   * If( only true ) * Else ( if not true) * Else if( when the code has more than 2 conditions) |
| 1. Looping | It is used when there is any code that is needed more than twice.   * While * For * Do-while |
| 1. Jumping | It is used to stop the process when the required output comes or to select the options.   * Break- applied only for switch and looping statement. * Continue- applied only for looping statement. |
| 1. Selection | It takes the step by step process to stop that jumping statement.  Switch(<option>)  {Case1<op1>  Case2<op2>  } |

**Q) What is an Array? Types of an array in java?**

A) An array is a collection of items of same data type stored at next to each other memory locations.

There are two types of arrays in Java they are –

* Single Dimensional Array
* Multidimensional Array
* Single dimensional array : It is a normal array where, the array contains sequential elements.

Syntax: <Data Type> [ ] <variable>= new <Data Type>[<size>]; (declaration)

<Data Type> [ ] <variable>={ }; (initialization)

* Multi-dimensional array : It is an array of arrays. A two dimensional array is an array of one dimensional arrays and a three dimensional array is an array of two dimensional arrays.

Syntax: <Data Type>[ ] [ ]<variable>= new <Data Type>[ {<row, column>} ,{ < row,column >}]; (declaration)

Program: program for Diagonal of Matrix and Transpose of Matrix.

**Q) what is Exception?**

A) Exception is that when an unexpected events which occurs during the execution of program i.e. run time that stops the execution flow .

**Q) Difference between Error v/s Exception?**

**A)**

|  |  |
| --- | --- |
| Error | Exception |
| Error is done by humans. | Exception is done while compile time or run time. |
| Cannot recover an error. | Can recover an error. |
| Errors are unchecked type. (Compile- time) | Exceptions are checked as well as unchecked type.( run-time) |
| java.lang.Error package. | java.lang.Exception package |

**Q) Difference between Throw v/s Throws?**

|  |  |
| --- | --- |
| Throw | Throws |
| A throw is used to throw an exception explicitly. | A throws to declare one or more exceptions, separated by commas. |
| This keyword is used in the method. | Signature method is used with keyword throws. |
| It is used when it is required to throw an Exception logically. | It is used when the function has some statements that can lead to exceptions. |
| Throw keyword is followed by the instance variable. | Throws keyword is followed by the exception class. |

**Q) Can try have more than one catch?**

A) Yes, If an action to perform in different tasks at the occurrence of different Exceptions can be used by java multi catch block.

**Q) Can try exists without Catch?**

A) Yes, It is possible to have a try block without a catch block by using a final block. A final block will always execute even there is an exception occurred in a try block.

**Q) what is Finally block?**

A) If any excepts are occurred in try or catch block this block i.e. finally block will execute the flow of program.

**Q) Name the few exception in Java?**

A) Index out of bonds, Arithmetic Exception, Divide by zero Exception.

**Q) How can you create your own custom exception?**

**A)** Creating our own Exception is known as custom exception or user-defined exception.

**Q) What is string in java?**

A) Collection of one or more characters is known as String.

**Q) why string is immutable?**

1. String Pool is a storage area in heap memory.
2. String pooling helps to save a memory by creating only one object.
3. First it checks the same data is stored then no object is created, if not then it creates the new object.
4. Immutable simply means unmodifiable or unchangeable.
5. Once String object is created its data can't be changed but a new String object is created.
6. If one reference variable changes the value of the object, it will be affected by all the reference variables.

**Q) Difference between String / String buffer / String builder?**

**A)**

|  |  |  |
| --- | --- | --- |
| String | String Buffer | String builder |
| Stores in String Pooling memory | Stores in Heap memory. | Stores in Heap memory. |
| Immutable. | Mutable. | Mutable. |
| Slower performance than string builder and string buffer. | Slower performance than string builder but faster than string. | Faster performance than string buffer. |

**Q) Name the few string methods which we use often?**

**A)**

1. toCharAt()
2. CharAt()
3. Concat()
4. Substring()
5. Split()

Program: program to use string inbuild method.

# COLLECTIONS

**Q) What is a collection?**

A) Collection means the combination of all data type together stored in a group. Collection is a framework.

**Q) Difference between Collection v/s Array?**

|  |  |
| --- | --- |
| Collection | Array |
| Homogeneous data as well as heterogeneous data. | Homogeneous data only. |
| Not based on size. | Size is fixed. |
| Low performance. | High performance. |
| Less memory. | More memory. |

**Q) what are Types of collections and its differences?**

Types of collections

VALUE-BASED

KEY-VALUE BASED

|  |  |
| --- | --- |
| Value based | Key-value based |
| 1. List 2. Set 3. Sorted set | 1. Map |
| It allows duplicates. | It allows duplicate values but not duplicate keys. |
| It stores only single values. | It stores multiple values.. |
| It allows null values. | It only allows one null value. |

**Q) Difference between HashSet v/s HashMap?**

A)

|  |  |
| --- | --- |
| HashSet | HashMap |
| Implementation set interface. | Implementation of Map interface. |
| Can allow more than one null value and key. | Cannot allow more than one null value. |
| Add method of hashset is used to add element in hashset. | Put method of hashmap is used to add element in hashmap. |
| In HashMap, it stores a key-value pair. | In HashSet, it stores objects. |

**Q)Difference between HashMap v/s Hashtable?**

**A)**

|  |  |
| --- | --- |
| HashMap | Hashtable |
| No method is synchronized. | Every method is synchronized. |
| Performance is high. | Performance is low. |
| Null is allowed for both key and value. | Null is not allowed for both key and value. Otherwise, it will show a null pointer exception. |
| 1.2 version. | 1.0 version. |

**Q) Difference between Java collection v/s Java collections?**

|  |  |
| --- | --- |
| Java collection | Java collections |
| It is an interface. | It is a utility class. |
| It shows a set of individual objects as a single unit. | It shows multiple utility processes and methods that are utilised to operate on collection. |
| This interface includes a static method. It can also have both default and methods. | It only includes static methods. |

Program: write a program to insert student details in Map(universities , school, class, student).