**Written Examination**

### Why is Java considered platform independent?

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1. **Why is Java considered platform independent?**

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1. **What is the difference between ArrayList and vector?**

|  |  |
| --- | --- |
| Array List is not synchronized. | Vector is synchronized. |
| Array List is fast as it’s non-synchronized. | Vector is slow as it is thread safe. |
| If an element is inserted into the Array List, it increases its Array size by 50%. | Vector defaults to doubling size of its array. |
| Array List does not define the increment size. | Vector defines the increment size. |
| Array List can only use Iterator for traversing an Array List. | Vector can use both Enumeration and Iterator for traversing. |

### How do equals() and == differ?

Equals() method is defined in Object class in Java and used for checking equality of two objects defined by business logic.

“==” or equality operator in Java is a binary operator provided by Java programming language and used to compare primitives and objects. *public boolean equals(Object o)* is the method provided by the Object class. The default implementation uses == operator to compare two objects. For example: method can be overridden like String class. equals() method is used to compare the values of two objects.

### Explain public static void main(String args[]) in Java

**public**: Public is an access modifier, which is used to specify who can access this method. Public means that this Method will be accessible by any Class.

**static**: It is a keyword in java which identifies it is class-based. main() is made static in Java so that it can be accessed without creating the instance of a Class. In case, main is not made static then the compiler will throw an error as **main**() is called by the JVM before any objects are made and only static methods can be directly invoked via the class.

**void**: It is the return type of the method. Void defines the method which will not return any value.

**main**: It is the name of the method which is searched by JVM as a starting point for an application with a particular signature only. It is the method where the main execution occurs.

**String args[]**: It is the parameter passed to the main method.

### Why Java is not 100% Object-oriented?

Java is not 100% Object-oriented because it makes use of eight primitive data types such as boolean, byte, char, int, float, double, long, short which are not objects.

### What are wrapper classes in Java?

Wrapper classes convert the Java primitives into the reference types (objects). Every primitive data type has a class dedicated to it. These are known as wrapper classes because they “wrap” the primitive data type into an object of that class. Refer to the below image which displays different primitive type, wrapper class and constructor argument.

### What are constructors in Java?

In Java, constructor refers to a block of code which is used to initialize an object. It must have the same name as that of the class. Also, it has no return type and it is automatically called when an object is created.

### What is singleton class in Java and how can we make a class singleton?

Singleton class is a class whose only one instance can be created at any given time, in one JVM. A class can be made singleton by making its constructor private.

1. **What is a package in Java? List down various advantages of packages.**

Packages in Java, are the collection of related classes and interfaces which are bundled together. By using packages, developers can easily modularize the code and optimize its reuse. Also, the code within the packages can be imported by other classes and reused

1. **Why pointers are not used in Java?**

Java doesn’t use pointers because they are unsafe and increases the complexity of the program. Since, Java is known for its simplicity of code, adding the concept of pointers will be contradicting. Moreover, since JVM is responsible for implicit memory allocation, thus in order to avoid direct access to memory by the user,  pointers are discouraged in Java.

1. **What are access modifiers in Java?**

In Java, access modifiers are special keywords which are used to restrict the access of a class, constructor, data member and method in another class. Java supports four types of access modifiers:

1. *Default*
2. *Private*
3. *Protected*
4. *Public*
5. **What is an object in Java and how is it created?**

An object is a real-world entity that has a state and behavior. An object has three characteristics:

1. State
2. Behavior
3. Identity

An object is created using the ‘new’ keyword. For example:

ClassName obj = new ClassName();

1. **What is the difference between a local variable and an instance variable?**
2. In Java, a **local variable** is typically used inside a method, constructor, or a **block** and has only local scope. Thus, this variable can be used only within the scope of a block. The best benefit of having a local variable is that other methods in the class won’t be even aware of that variable.

#### **Example**

|  |  |
| --- | --- |
| 1  2  3  4 | if(x > 100)  {  String test = "Edureka";  } |

2. Whereas, an **instance variable** in Java, is a variable which is bounded to its object itself. These variables are declared within a **class**, but outside a method. Every object of that class will create it’s own copy of the variable while using it. Thus, any changes made to the variable won’t reflect in any other instances of that class and will be bound to that particular instance only.

|  |  |
| --- | --- |
| 1  2  3  4 | class Test{  public String EmpName;  public int empAge;  } |

1. **What is final keyword in Java?**

**final**is a special keyword in Java that is used as a non-access modifier. A final variable can be used in different contexts such as:

* **final variable**

When the final keyword is used with a variable then its value can’t be changed once assigned. In case the no value has been assigned to the final variable then using only the class constructor a value can be assigned to it.

#### **final method**

When a method is declared final then it can’t be overridden by the inheriting class.

#### **final class**

When a class is declared as final in Java, it can’t be extended by any subclass class but it can extend other class.

1. **Is a finally block executed when an exception is thrown from a try block that does**

**not have a catch block, and if so, when?**

**it should be compulsory run**

**it dosen’t matter what is the run(try block or catch block)**

1. **Draw an ER diagram according to the technical exercise provided**
2. **Implement normalization and sample table design for above drawn ER diagram**