CDAC Mumbai PG-DAC August 24
Assignment No. 4

Non-Static methods

① What is the role of the static keyword in the context of memory management.

→ The static keyword in Java is mainly used for memory management. The static keyword in Java is used to share the same variable or method of a given class. The users can apply static keywords with variables, methods, blocks, & nested classes. The static keyword belongs to the class than an instance of the class.

② Can static methods be overloaded & overridden in Java? How static variables shared across multiple instances of a class?

→ They cannot be overridden because they do not act on a specific instance of an object. In Java, static methods can be overloaded but not overridden. They can have different parameters while having the same name in the same class or subclass.

③ What is the significance of the final keyword in Java?

→ The final keyword is a non-access modifier used for classes, attributes & methods, which makes them non-changeable (impossible to inherit or override). The final keyword is useful when you want a variable to always store the same value, like PI (3.14159...). The final kgword is called a "modifier".

④ What are narrowing & widening conversions in Java?

→ Widening Conversions: Occurs if we take a specific type (subclass) & attempt to assign it to a less specific type (superclass). Narrowing Conversions: Occurs when we take a less specific type (superclass) & attempt to assign it to a more specific type (subclass), which requires explicit casting.

⑤ Provide examples of narrowing & widening conversions between primitive data types.

→ A narrowing conversion changes a value to a data type that might not be able to hold some of the possible values. For example, a fractional value is rounded when it is converted to an integral type, & a numeric type being converted to Boolean is reduced to either True or False.

⑥ How does Java handle potential loss of precision during narrowing conversions?

→ If you attempt to narrow cast a value that is too large for the target data types, the result will be a loss of data due to truncation or overflow. Java does not perform any automatic range checking during narrowing conversions.

(7) Explain the concept of automatic widening conversion in Java.

→ When you assign a value of one data type to another, the two types might not be compatible with each other. If the data types are compatible, then Java will perform the conversion automatically. Known as Automatic Type Conversion, else if not then they need to be cast or converted explicitly.

(8) What are the implications of narrowing & widening conversions on type compatibility & data loss?

→ In narrowing data overflow happens as a result of a data type's smaller value range. Since widening happens from a smaller data type to a bigger data type, there is space for accomodation, & data loss or data overflow is not a concern when it comes to widening.