Assignment 4

M T W T F S S
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1. What does the static keyword mean in java? Explain the difference between static and non-static methods.

⟹ Static keyword in java -

The static keyword in java is used for memory management and indicates that a member (method or variable) belongs to the class rather than to any specific instance. This means static members are shared across all instance of the class.

Static vs Non-static Methods :-

- Static Methods :- Belong to the class and can be called without creating an instance. They cannot access non-static members directly.

- Non-static Method :- are instance methods & can access both static & non static members.

2) What is the Role of the static keyword in the context of memory management?

⟹ Static members are stored in a special memory area known as the Method Area (part of the heap). This makes them shared across all instances, reducing memory usage when dealing with multiple objects of the same class.

3) Can static methods be overloaded and overridden in Java? How static variables shared across multiple instances of a class?

⟹ Overloading - static methods can be overloaded (same name, different parameter)
Overriding - Static methods cannot be overridden because they are resolved at compile time (not runtime).
Static variables - They are shared across all instance of a class, meaning any change made to a static variable by one instance is visible to all other instances.

4) What is the significance of the final keyword in Java?

⟹ The final keyword can be used with variables, method and classes.
Final variable value cannot be changed once assigned.
Final method cannot be overridden by subclass.
Final class cannot be subclassed.

5) What are narrowing & widening conversion in java?

⟹ Narrowing - Explicit conversion from a larger data type to a smaller one, which may lead to data loss (e.g. double to int)
[e.g double x = 9.78; int y = (int) x;]

Widening :- Automatic conversion from a smaller data type to a longer one (e.g. int to long). [e.g int a=10; long b=a;]

7) How does java handles potential loss of precision during narrowing conversion?

⟹ Java shows a warning & requires an explicit cast to indicate that precision loss might occur (e.g. from double to int).

8) Explain the concept of automatic widening conversion in Java.

⟹ Java automatically widens smaller data types to larger compatible types (e.g. int to double) without an explicit cast, as it is considered safe and free from data loss.

9) What are the implications of narrowing & widening conversions on type compability & data loss?

⟹ Widening : safe & does not lose data.

Narrowing : May lead to data loss, requising explicit casting to acknowledge potential precision loss.