Assignment 1 – Java Code Review & Error Correction

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Snippet 1

Error: Missing semicolon (;) after System.out.println.

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
  }
}
```

Explanation:
In Java, every statement must end with a semicolon. Without it, the compiler throws a syntax error.

Snippet 2

Error: Method greet() is called directly inside the class, not inside main or another method.

Corrected Code:

```
public class Main {
  public void greet() {
    System.out.println("Hello");
  }
  public static void main(String[] args) {
    Main obj = new Main();
    obj.greet();
```

```
  }
}
```

Explanation:
Code inside a class must be inside a method or block. To call greet(), we create an object of the class inside main.

Snippet 3

Error: Assigning a String ("10") to an int variable.

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    int number = 10;
    System.out.println("The number is: " + number);
  }
}
```

Explanation:
Java is strongly typed. "10" is a String, not an integer. We must use 10 (without quotes) to store in an int.

Snippet 4

Error: Accessing numbers[4], but the array only has 4 elements (index 0–3).

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    int[] numbers = {1, 2, 3, 4};
    System.out.println("The fourth element is: " + numbers[3]);
```

```
  }
}
```

Explanation:
Array indexing in Java starts at 0. With 4 elements, valid indices are 0–3. numbers[4] gives ArrayIndexOutOfBoundsException.

Snippet 5

Error: addNumbers is non-static but called from main (a static context).

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    int result = addNumbers(5, 10);
    System.out.println("Result: " + result);
  }
  public static int addNumbers(int a, int b) {
    return a + b;
  }
}
```

Explanation:
Static methods can be called without creating an object. Since main is static, addNumbers should also be static (or called via an object).

Snippet 6

Error: Variable age is declared but not initialized before use.

Corrected Code:

```
public class Main {
```

```
  public static void main(String[] args) {
    int age = 20;  // initialize age
    if (age >= 18) {
      System.out.println("You are eligible to vote.");
    }
  }
}
```

Explanation:
In Java, local variables must be initialized before use. Otherwise, the compiler gives an error.

Snippet 7

Error: Variable i is declared inside the for loop, so it cannot be accessed outside the loop.

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    int i;
    for (i = 0; i < 5; i++) {
      System.out.println("Number: " + i);
    }
    i++;
    System.out.println("Outside loop: " + i);
  }
}
```

Explanation:
If i is declared inside for, its scope ends with the loop. Declaring i outside makes it accessible afterward.

Snippet 8

Error: Missing initialization and wrong while-loop syntax.

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
      int count = 0;
      while (count < 10) {
         System.out.println("Count: " + count);
         count++;
      }
   }
}
```

Explanation:

- count must be declared and initialized before use.
- The correct syntax is while (condition) { ... }, not while condition { ... }.