Array Operations in Java - Problems with Solutions

1. Sort an Array

```java
import java.util.Arrays;

public class SortArray {
    public static void main(String[] args) {
        int[] arr = {40, 10, 30, 20};
        Arrays.sort(arr);  // Built-in sort

        System.out.println("Sorted Array:");
        for (int num : arr) {
            System.out.print(num + " ");
        }
    }
}
// Output: 10 20 30 40
```

2. Search for an Element

```java
public class SearchArray {
    public static void main(String[] args) {
        int[] arr = {10, 20, 30, 40};
        int key = 30;
        boolean found = false;

        for (int num : arr) {
            if (num == key) {
                found = true;
                break;
            }
        }

        if (found)
            System.out.println(key + " is found.");
        else
            System.out.println(key + " is not found.");
    }
}
// Output: 30 is found.
```

3. Update an Element

```java
public class UpdateArray {
    public static void main(String[] args) {
        int[] arr = {10, 20, 30, 40};

        for (int i = 0; i < arr.length; i++) {
            if (arr[i] == 20) {
                arr[i] = 25;
```

```java
            }
        }

        for (int num : arr) {
            System.out.print(num + " ");
        }
    }
}
// Output: 10 25 30 40
```

4. Insert Element at Index

```java
public class InsertArray {
    public static void main(String[] args) {
        int[] arr = new int[6];
        int n = 4;
        arr[0] = 10; arr[1] = 20; arr[2] = 30; arr[3] = 40;

        int index = 2, value = 25;

        for (int i = n; i > index; i--) {
            arr[i] = arr[i - 1];
        }
        arr[index] = value;
        n++;

        for (int i = 0; i < n; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}
// Output: 10 20 25 30 40
```

5. Delete an Element

```java
public class DeleteArray {
    public static void main(String[] args) {
        int[] arr = {10, 20, 30, 40, 50};
        int n = arr.length;
        int value = 30;

        int index = -1;
        for (int i = 0; i < n; i++) {
            if (arr[i] == value) {
                index = i;
                break;
            }
        }
```

```java
        if (index != -1) {
            for (int i = index; i < n - 1; i++) {
                arr[i] = arr[i + 1];
            }
            n--;
        }

        for (int i = 0; i < n; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}
// Output: 10 20 40 50
```

6. Replace Even Numbers with 0

```java
public class ReplaceArray {
    public static void main(String[] args) {
        int[] arr = {10, 21, 30, 45};

        for (int i = 0; i < arr.length; i++) {
            if (arr[i] % 2 == 0) {
                arr[i] = 0;
            }
        }

        for (int num : arr) {
            System.out.print(num + " ");
        }
    }
}
// Output: 0 21 0 45
```

7. Shift Elements to the Right

```java
public class ShiftArray {
    public static void main(String[] args) {
        int[] arr = {10, 20, 30, 40};
        int last = arr[arr.length - 1];

        for (int i = arr.length - 1; i > 0; i--) {
            arr[i] = arr[i - 1];
        }
        arr[0] = last;

        for (int num : arr) {
            System.out.print(num + " ");
        }
    }
```

```
}
// Output: 40 10 20 30
```

8. Sum of Elements

```java
public class SumArray {
    public static void main(String[] args) {
        int[] arr = {5, 10, 15, 20};
        int sum = 0;

        for (int num : arr) {
            sum += num;
        }

        System.out.println("Sum: " + sum);
    }
}
// Output: Sum: 50
```