CS401-2024-09A-09D-01 Modern Programming Practices

LAB 7

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Group 4

Members:

- Awais Waheed - 618677
- Arslanbek Ametov - 618653

Question 1

Part B

The issue with the equals method in the Employee class is that it does not override the equals method from the Object class properly. In Java, the signature for the equals method must be:

```
@Override
public boolean equals(Object obj)
```

Currently, the method signature is:

```
public boolean equals(Employee e)
```

This is not overriding the Object class's equals method. Instead, it is overloading it, which means it's not being called by methods like List.contains() that rely on the equals(Object obj) method to determine equality. Fixed the issue by correctly implementing the equals method.
Note: Updated Code has been placed in prob1.partB package.

Part C

The issue with the current code is that it's using a HashMap<Employee, Employee> to track duplicates, but the Employee class doesn't override the hashCode() method. In Java, when you use a HashMap (or any other hash-based collection like HashSet), both equals() and hashCode() must be overridden to maintain the contract between these two methods. Fixed the code by implementing hashCode method.
Note: Updated Code has been placed in prob1.partC package.

Part D

In the removeDuplicates() method, code is modifying the visited field of Employee objects in the tracker HashMap. However, since visited is part of the equals() and hashCode() methods, changing this field will alter the equality of the object. This can lead to inconsistent behavior in the HashMap. Issue fixed by removing the use of ‘visited’ field from both methods.
Note: Updated Code has been placed in prob1.partD package.

Question 2

Code is in the prob2 package.

Question 3

Code is in the prob3 package.