**1.**

**Updating JavaBank to Use ArrayList**

**(a) Open javabank.java**

* First, locate and open the javabank.java file in your IDE.

**(b) Replace Static Array with ArrayList**

**static ArrayList<AbstractBankAccount> myAccounts = new ArrayList<AbstractBankAccount>();**

**(c),(d)**

**myAccounts[noAccounts] = new CreditAccount(name, accountNum, balance);**

**myAccounts.add(new CreditAccount(name, accountNum, balance));**

**myAccounts[i].setBalance(myAccounts[i].getBalance() + deposit);**

**myAccounts.get(i).setBalance(myAccounts.get(i).getBalance() + deposit);**

**2.**

**(a)**

**public class BikeList {**

**public static void main(String[] args) {**

**}**

**}**

**(b)**

**ArrayList<Bike> bikes = new ArrayList<>();**

**(c)**

**int mountainBikeSales = 0;**

**int roadBikeSales = 0;**

**(d)**

**public static void fillArray(ArrayList<Bike> bikes) {**

**Random rand = new Random();**

**for (int i = 0; i < 10; i++) {**

**if (rand.nextDouble() < 0.5) {**

**bikes.add(new MountainBike());**

**} else {**

**bikes.add(new RoadBike());**

**}**

**}**

**}**

**fillArray(bikes);**

**(e)**

**public static void displayStock(ArrayList<Bike> bikes) {**

**for (Bike bike : bikes) {**

**System.out.println(bike);**

**}**

**}**

**displayStock(bikes);**

**(f)**

**public static int calculateStock(ArrayList<Bike> bikes) {**

**int bikesSold = 0;**

**for (Bike bike : bikes) {**

**if (bike instanceof MountainBike) {**

**bikesSold++;**

**}**

**}**

**return bikesSold;**

**}**

**(g)**

**public static void displayBikeNumbers(ArrayList<Bike> bikes) {**

**int mb = calculateStock(bikes);**

**int rb = bikes.size() - mb;**

**System.out.println("Stock Levels");**

**System.out.println("We have " + mb + " Mountain Bikes in stock");**

**System.out.println("We have " + rb + " Road Bikes in stock");**

**}**

**displayBikeNumbers(bikes);**

**3. Difference Between Set and List**

* **Set:**
  + **Does not allow duplicate elements.**
  + **Does not maintain order (unless using specific implementations like LinkedHashSet).**
  + **Examples: HashSet, TreeSet.**
* **List:**
  + **Allows duplicate elements.**
  + **Maintains the order of insertion.**
  + **Examples: ArrayList, LinkedList.**

**4. Using a Set to Roll Dice**

* **You would not use a Set to track the frequency of dice rolls because a Set does not allow duplicates and does not maintain the order. Instead, a Map or List would be more appropriate, where you can maintain the frequency count of each combination.**

**5.**

**Set<String> countries = new HashSet<>();**

**countries.add("USA");**

**countries.add("Canada");**

**countries.add("Mexico");**

**countries.add("Germany");**

**countries.add("France");**

**countries.add("Canada");**

**for (String country : countries) {**

**System.out.println(country);**

**}**

6.

ArrayList<String> countriesList = new ArrayList<>();

countriesList.add("USA");

countriesList.add("Canada");

Collections.sort(countriesList);

HashSet<String> countriesSet = new HashSet<>();

countriesSet.add("USA");

countriesSet.add("Canada");

List<String> sortedList = new ArrayList<>(countriesSet);

Collections.sort(sortedList);