University of Ruhuna
Faculty of Technology
Department of Informtion and Communication Technology

Advanced Programming Practicum
(ICT3122)

Lab Sheet 10 26th Feb 2024

Object Serialisation in Java

Problem Statement:

You are tasked with implementing a simple inventory management system for a small store using Java serialization. The system should be able to serialize and deserialize instances of the **Product** class. Each product has a name, a unique identifier, and a quantity in stock.

Your task is to implement the following:

1. Define a **Product** class with the following attributes:
    - **name** (String): The name of the product.
    - **id** (int): The unique identifier of the product.
    - **quantity** (int): The quantity of the product in stock.
2. Implement serialization and deserialization methods for the **Product** class.
3. Write a method to add new products to the inventory.
4. Write a method to update the quantity of a product in the inventory.
5. Write a method to remove a product from the inventory.
6. Write a method to display the current inventory.

Guidelines:

- Ensure that the **Product** class implements the **Serializable** interface.
- Use appropriate exception handling to handle errors during serialization and deserialization.
- Handle cases where the product being added already exists in the inventory (update the quantity instead).
- Handle cases where the product being updated or removed does not exist in the inventory.

Example Usage:

```
public class Main {
	public static void main(String[] args) {
		InventoryManager inventoryManager = new InventoryManager();
		// Adding products to the inventory
		inventoryManager.addProduct("Laptop", 1001, 10);
		inventoryManager.addProduct("Mobile Phone", 1002, 20);
		// Displaying current inventory
```

```
            inventoryManager.displayInventory();
            // Updating quantity of a product
            inventoryManager.updateProductQuantity(1001, 5);
            // Removing a product from inventory
            inventoryManager.removeProduct(1002);
            // Displaying updated inventory
            inventoryManager.displayInventory();
            // Serialize and deserialize the inventory
            inventoryManager.serializeInventory("inventory.ser");
            inventoryManager.deserializeInventory("inventory.ser");
        }
}
```

Expected Output:

Current Inventory:
Product: Laptop, ID: 1001, Quantity: 10
Product: Mobile Phone, ID: 1002, Quantity: 20

Updated Inventory:
Product: Laptop, ID: 1001, Quantity: 5

Deserialized Inventory:
Product: Laptop, ID: 1001, Quantity: 5