

SCS 2204 - Functional Programming

Scala Tutorial – 06

1. You are managing an inventory system for a warehouse, where each product is represented by a unique product ID along with details such as name, quantity, and price. Your tasks include retrieving all product names from the collection, calculating the total value of all products, checking if the collection is empty, merging two collections of products by updating quantities and retaining the highest price for products with the same ID, and checking if a product with a specific ID exists and printing its details if it does.

Implement the following operations using Scala Maps

- I. Retrieve all product names from inventory1.
- II. Calculate the total value of all products in inventory1.
- III. Check if inventory 1 is empty.
- IV. Merge inventory1 and inventory2, updating quantities and retaining the highest price.
- V. Check if a product with a specific ID (e.g., 102) exists and print its details.(Implement the code to check if product ID 102 exists in inventory1 and print its details if it does.

2. Develop a Scala application for managing student records with the following functionalities using Scala Tuples.

a. **Function `getStudentInfo`:**

Reads a student's name, marks, and total possible marks from the keyboard. Validates input to ensure the name is not empty and marks are positive integers not exceeding the total possible marks. Calculates the percentage and assigns a grade based on:

1. A for percentage $\geq 90\%$
2. B for $75\% \leq \text{percentage} < 90\%$
3. C for $50\% \leq \text{percentage} < 75\%$
4. D for percentage $< 50\%$

b. **Function `printStudentRecord`:**

Takes a tuple (name: String, marks: Int, totalMarks: Int, percentage: Double, grade: Char) and prints:

c. **Function `validateInput`:**

Validates user input (name, marks, total possible marks) and returns (isValid: Boolean, errorMessage: Option[String]).

d. **Function `getStudentInfoWithRetry`:**

Prompts the user for input until valid data is provided, using `validateInput`. Returns the tuple as specified in `getStudentInfo`.