Store Simulator Project - Setup, Build, and Test Cases Report

1. Setup and Installation Steps

1. **Install .NET SDK**

   o Download and install the latest .NET SDK from
      https://dotnet.microsoft.com/download

2. **Check .NET installation**

3. dotnet --version

4. **Clone Project Repository**

5. git clone < Abdelrahmanemam01/store-simulator>

6. cd store-simulator-main\store-simulator-main

2. Build and Run the Project

1. **Navigate to the source folder containing the project file**

2. cd src

3. **Build the project**

4. dotnet build StoreApp.fsproj

5. **Run the application (optional)**

6. dotnet run --project StoreApp.fsproj

3. Run Tests

1. **Navigate to the test project folder**

2. cd ..\StoreTests

3. **Run tests**

4. dotnet test StoreTests.fsproj

5. **Observe test results**

- Total tests
- Passed tests
- Failed tests

4. Test Cases Implemented

Catalog Tests

- Find by ID returns correct product
- Search by keyword returns matching products
- Filter by category returns correct items
- Filter by price range returns correct items
- Filter by stock availability returns correct items
- Find by non-existing ID returns None
- Filter by category is case-insensitive
- Search keyword not matching any product returns empty list
- Price filter with invalid range returns empty list

Cart Tests

- Add item increases quantity
- Update quantity changes quantity
- Update quantity removes item if zero
- Remove item works correctly
- Clear cart empties cart
- Get total price calculates correctly
- Apply percentage discount works correctly
- Add zero or negative quantity does nothing
- Add non-existing product does nothing
- Update quantity for non-existing product does nothing
- Remove non-existing product does nothing
- Add item with very large quantity

- Update quantity to zero removes item

- Add item with zero price works correctly

- Combine multiple discounts correctly

Price Calculator Tests

- Calculate checkout total returns correct final

- Zero discount returns same total

- 100% discount returns zero

- Checkout with zero discount returns total

- Checkout with discount >100% returns zero

- Checkout with negative discount handles correctly

Cart Json Tests

- Cart to JSON and back roundtrip works

- Load from empty JSON returns empty cart

- Cart to pretty JSON returns valid JSON

- Load from invalid/corrupt JSON returns empty cart or controlled exception

- Save to file and load from file works correctly

Backup Manager Tests

- Create and restore backup works

- Print backup pretty returns valid JSON string

- Try get latest backup returns None if no backups

- Delete backup on non-existing file does not crash

- Delete all backups on empty folder does not crash

- Restore non-existing backup raises FileNotFoundException

- Create backup for very large file works

- Restore backup after original file deletion works