Sofia University
Department of Mathematics and Informatics

Course : OO Programming C#.NET
Date: November 28, 2022
Student Name:

Assignment 6

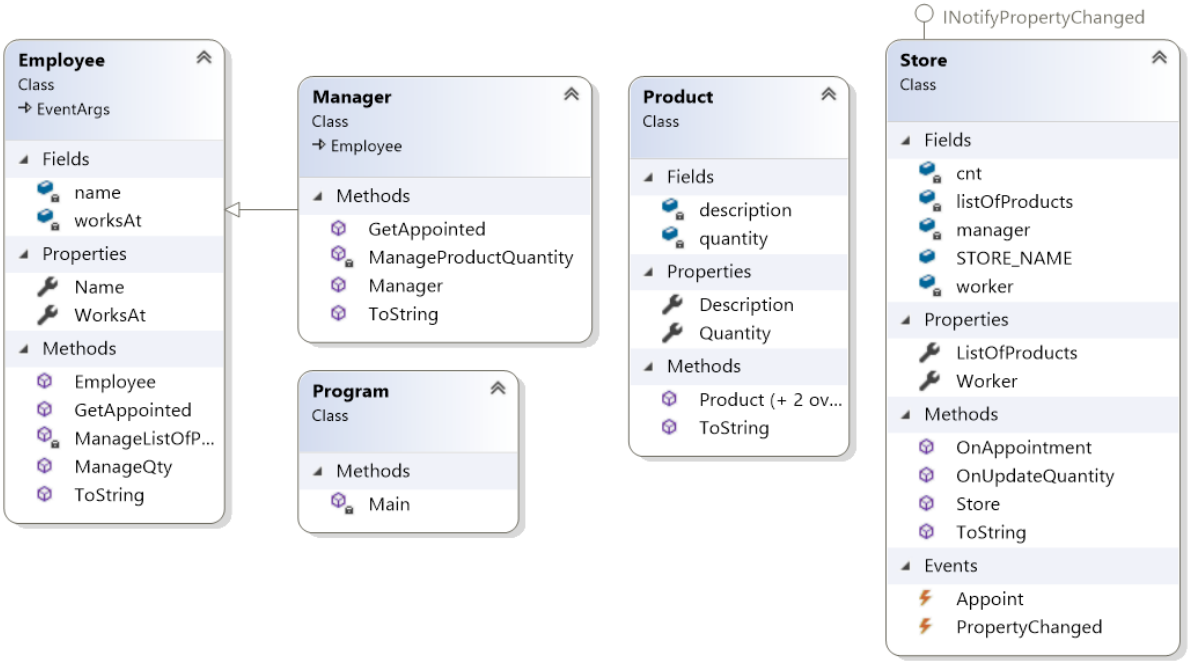
Submit the all C# .NET files developed to solve the problems listed below. Use comments and Modified-Hungarian notation.

Problem No. 1

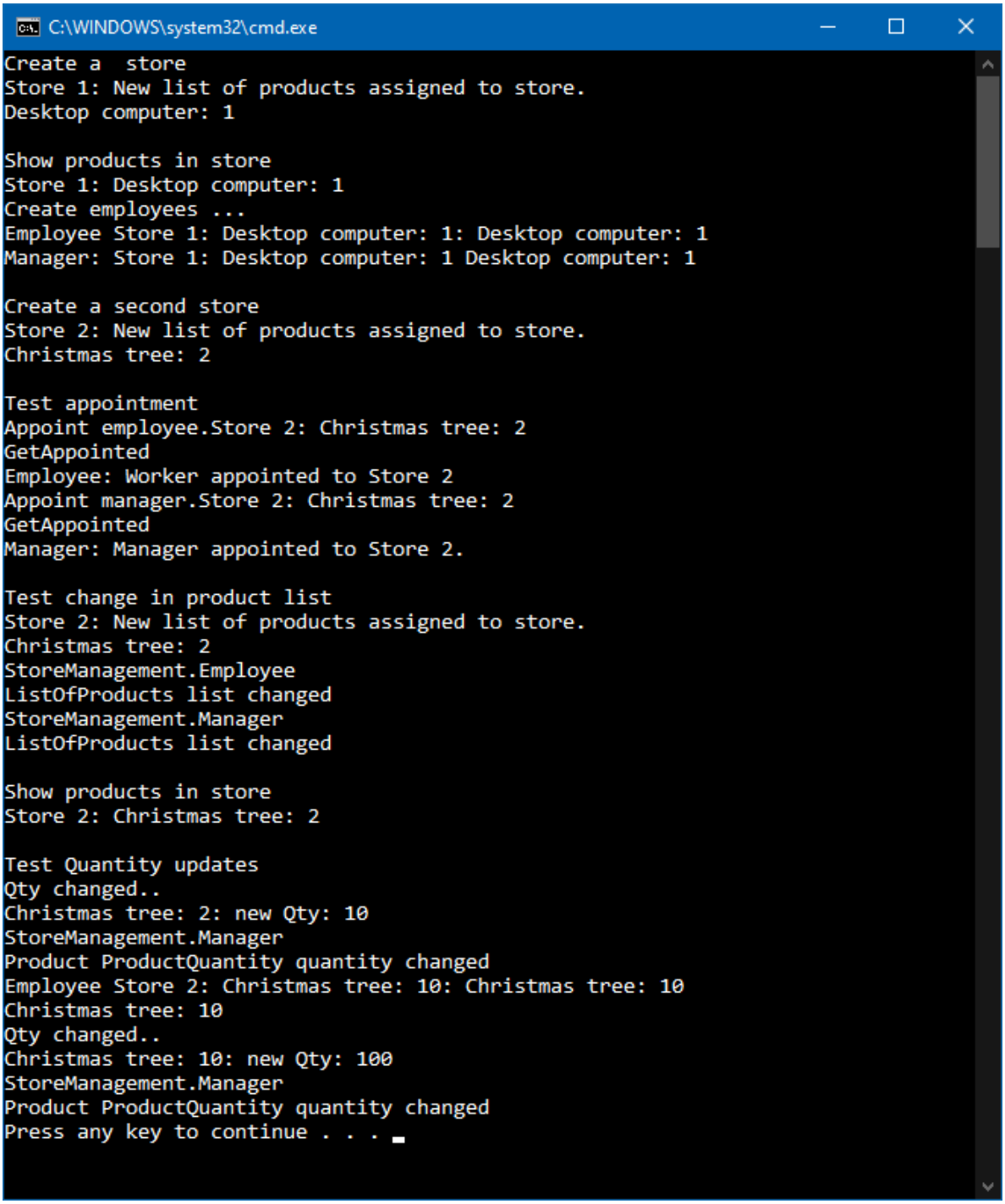
Consider a use case, where the main actors **`Employee`**, **`Manager`** and **`Store`** are represented in the following UML class diagram.
Class **`Store`** has a unique **`STORE_NAME`** like “Store 1”, Store 2” etc. (**`static`** datamember **`cnt`**) and a **`List<Product>`** named **`listOfProducts`**, where each product is an instance of **`class Product`** shown on the same diagram. The **`get`** property **`ListOfProducts`** returns a list all the current entries in **`listOfProducts`** (not their copies), while the **`set`** property assigns a deep copy of **`value`** to **`listOfProducts.`**
Store instances are managed by an **`Employee`** (**`worker`** datamemeber) and a **`Manager`** (**`worker`** datamemeber).
Class **`Store`** publishes three events, an **`EventHandler`** event **`Appoint`** and two **`PropertyChangedEventHandler`** events **`PropertyChanged`**. Classes **`Employee`** and **`Manager`** (note the IS-A relation between them) serve as event objects for this events.
The event **`PropertyChanged`** triggers for name "**`ProductQuantity`**" in method **`OnUpdateQuantity(int index, int newQty)`** of class **`Store`** when the quantity of a **`Product`** with **`index`** in the **`listOfProducts`** is updated to **`newQty`** by the **`worker`** in the store. The method prints out data about the **`Product`** instance being updated with its current and the updated **`quantity`**. After that it triggers the method for handling a property named "**`ProductQuantity`**". Class **`Manager`** defines **`internal`** method **`ManageProductQuantity()`** for handling changes in property "**`ProductQuantity`**" (only instances of **`Manager`** are subscribed for this event**)**
The **`OnUpdateQuantity()`** method is called by the **`worker`** at the **`Store`** using method **`ManageQty(Product p, int qty)`** defined in **`class Employee`**. Method **`ManageQty()`** delegates the execution of this task to method **`OnUpdateQuantity()`** of the store, where the worker is employed.
The event **`PropertyChanged`** triggers for name " **`ListOfProducts`**" in the **`set`** property **`ListOfProducts`** of class **`Store`** when a new list with products is assigned to the store.
The **`PropertyChanged`** event for name " **`ListOfProducts`**" is handled by **`internal`** method **`ManageListOfProducts()`** defined in class **`Employee.`** The method displays

the type of **Employee** that handles the **event** and a message with the **PropertyName**. (instances both of **Employee** and **Manager** are subscribed for this event)

The event **Appoint** triggers when an **worker** or a **manager** gets appointed to a store by means of the **OnAppointment**(**Employee employee**) method in class **Store**. Depending on the contents of the **employee** parameter this method initializes datamember **worker** or **manager.** Besides, the method subscribes the newly appointed **worker** or **manager** to the method **GetAppointed**() used to handle this event in classes **Employee** and **Manager**. It also subscribes the appointed worker and manager to **ManageListOfProducts**() and respectively **ManageListOfProducts**() and **ManageProductQuantity**(). The implementation of method **GetAppointed**() in both classes updates the **worksAt** datamember with the place of employment (reference to the **event source**, instance of **class Store**). This method also prints out a message that the **respective Employee** or **Manager** are appointed with text showing the **Employee** working position and the store **STORE_NAME** of employment.



Test the project solution with sample data. Shown below is sample output in the program execution.


C:\WINDOWS\system32\cmd.exe
Create a store
Store 1: New list of products assigned to store.
Desktop computer: 1
Show products in store
Store 1: Desktop computer: 1
Create employees ...
Employee Store 1: Desktop computer: 1: Desktop computer: 1
Manager: Store 1: Desktop computer: 1 Desktop computer: 1
Create a second store
Store 2: New list of products assigned to store.
Christmas tree: 2
Test appointment
Appoint employee.Store 2: Christmas tree: 2
GetAppointed
Employee: Worker appointed to Store 2
Appoint manager.Store 2: Christmas tree: 2
GetAppointed
Manager: Manager appointed to Store 2.
Test change in product list
Store 2: New list of products assigned to store.
Christmas tree: 2
StoreManagement.Employee
ListOfProducts list changed
StoreManagement.Manager
ListOfProducts list changed
Show products in store
Store 2: Christmas tree: 2
Test Quantity updates
Qty changed..
Christmas tree: 2: new Qty: 10
StoreManagement.Manager
Product ProductQuantity quantity changed
Employee Store 2: Christmas tree: 10: Christmas tree: 10
Christmas tree: 10
Qty changed..
Christmas tree: 10: new Qty: 100
StoreManagement.Manager
Product ProductQuantity quantity changed
Press any key to continue . . .