

### **Exercise 1: Architectural Styles**

**a) Is it possible to consider Model-View-Controller (MVC) as layered architecture? Please explain. (1 point)**

No, we can't consider MVC as layered architecture. In layered architecture a layer can use services only from immediate lower ones, so this architecture is linear. However, in MVC controller is connected with model and view, but model is connected with view as well, so this architecture is triangular.

**b) Please associate the layers of UWE with MVC. (1 point)**

UWE Layer	MVC element
Content	Model
Presentation	View
Hypertext	Controller

**c) What do you understand under the terms “high cohesion” and “low coupling”? Please explain. (1 point)**

Cohesion refers to what the class/ module is supposed to do. So high cohesion means that the class/module is focused on what it should be doing, for example only methods related to the intention of the class.

Coupling refers to how related are two classes / modules and how dependent they are on each other. Being low coupling would mean that changing something major in one class should not affect the other.

**d) What kind of design pattern is used in Model-View-Controller? Please explain this pattern and describe where and how this pattern is used in MVC. (2 points)**

In Model-View-Controller we use an Observer pattern. This pattern characterises to consist of an object, called the **subject**, that has a list of its dependents, called **observers**. Subject notifies them automatically of any state changes, usually by calling one of their methods.

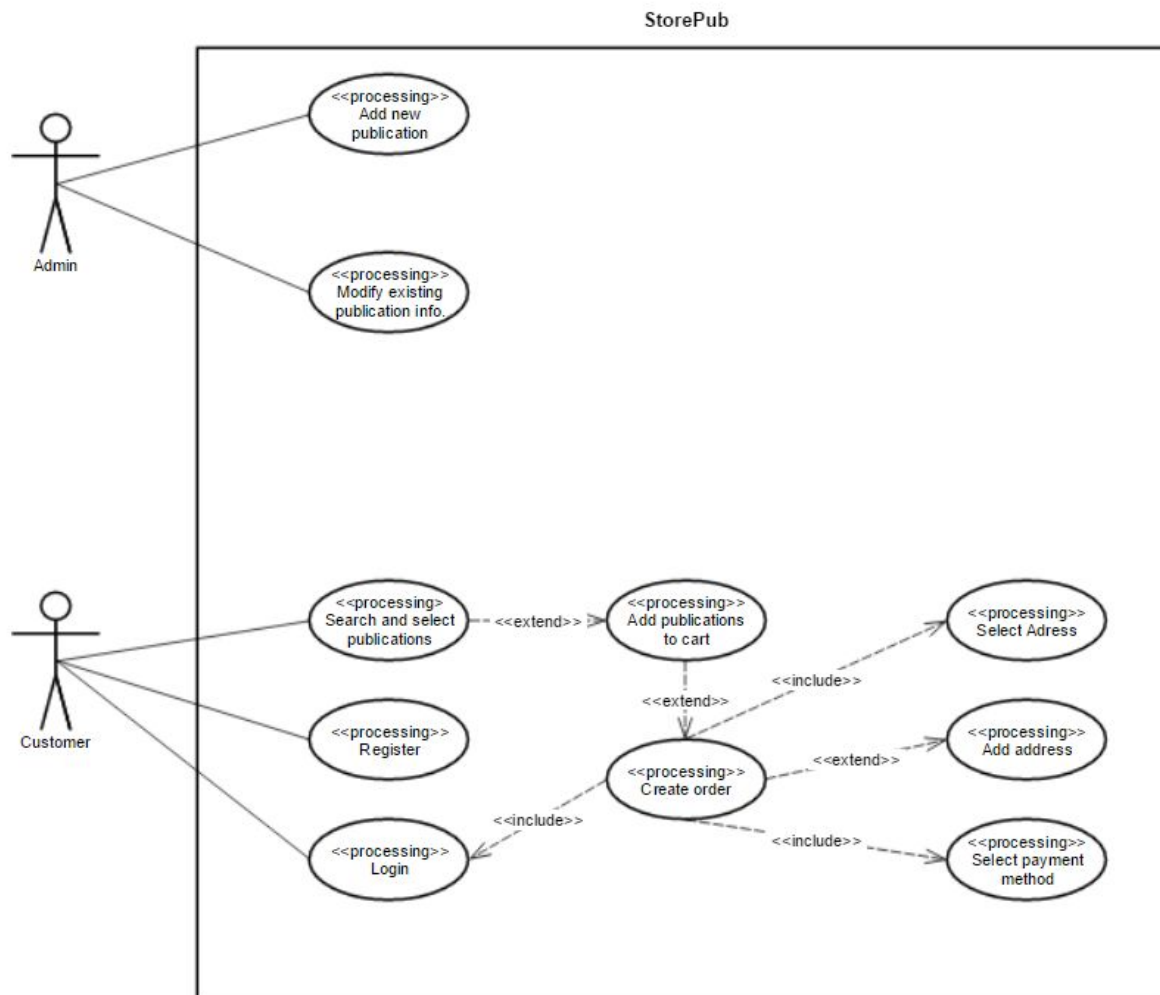
In MVC this pattern is used twice:

- **View** notifies **Controller** when there was an interaction with user
- **Model** notifies **View** when there was a change in data.

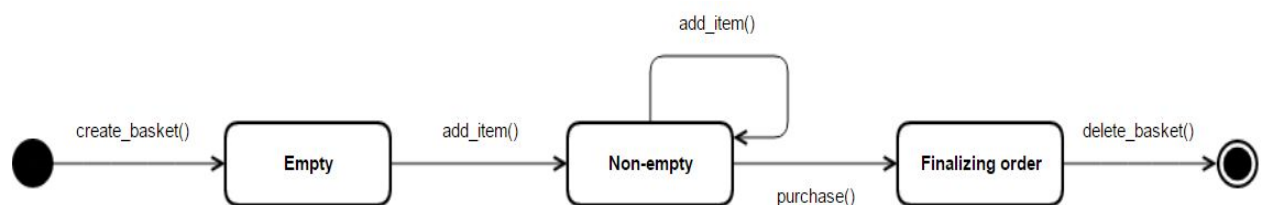
## Exercise 2: Modeling

Consider the online-shop “StorePub” which was defined in Exercise 2:

a) Describe the functional requirements of StorePub online-shop using a Use Case diagram.



b) Describe the lifecycle of a shopping cart using a stateMachine diagram (UML). (3)



Empty - this is a newly created basket with no items added yet.

Non-empty - this is a basket with at least one item. In this state you can add more items to basket.

finalizing order - this is a state in which you cannot add any more products to basket but it still exists waiting for creating an order. After that it is deleted.