**Use Case Diagrams Problem Set : 6 Problems**

1. Draw a **use-case** diagram using StarUML for the scenario given below.

**Web Customer actor** uses some web site to make purchases online. Top level **use cases** are **View Items**, **Make Purchase** and **Client Register**. View Items use case could be used by customer as to level use case if customer only wants to find and see some products. This use case could also be used as a part of Make Purchase use case. Client Register use case allows customer to register on the web site, for example to get some coupons or be invited to private sales. Note that **Checkout** use case is **included use case** not available by itself - checkout is part of making purchase. Except for the **Web Customer** actor there are several other actors which will be described below with detailed use cases. **View Items** use case is **extended** by several optional use cases - customer may search for items, browse catalog, view items recommended for him/her, add items to shopping cart or wish list. All these use cases are extending use cases because they provide some optional functions allowing customer to find item. **Customer Authentication** use

Case is **included** in **View Recommended Items** and **Add to Wish List** because both require customer to be authenticated. At the same time, item could be added to the shopping cart without user authentication. **Checkout** use case includes several required uses cases. Web customer should be authenticated. It could be done through user login page, user authentication cookie ("Remember me") or Single Sign-On (SSO). Web site authentication service is used in all these use cases, while SSO also requires participation of external identity provider. **Checkout** use case also includes **Payment** use case which could be done either by using credit card and external credit payment service or with PayPal.

**2. Draw a use-case diagram using staruml for the “music portal system**” **depicted below.** The following narration describes some of the use cases for “**Music Portal System**”. This system has **web user** as its main actor. The web user can perform first level uses cases namely **SearchAlbum, login, logout** and **ViewAccount**. **Registration** use case extends login i.e. if the user doesn’t have a login and wishes to create a new one, he or she can register to get a login. Moreover the **ViewAlbumDetail** use case is extending the SearchAlbum use case. Further the ViewAlbumDetail use case is extended by two more services viz**. DownloadAlbum** and **BuyAlbum**. Note that to download or to buy an album the user must be a registered member. Moreover the buyalbum and ViewAccount is further extended with R**echarge** use case**.**

3. Draw a **use-case diagram** using StarUML for the “Hospital Reception Subsystem” explained below:

**“Hospital Reception Subsystem”** supports some of the many job duties of hospital receptionist. Receptionist schedule patient’s appointments with the doctor and also schedule patient hospital admission. If doctor is available and admission to the hospital is possible then receptionist can extend the service to patient registration by collecting the patient information on patient arrival or over the phone. Patient registration is an integral part of patient Hospital Administration use case. Hospital administration use case is further generalized into outpatient hospital admission and inpatient hospital administration. Note that for the patient that will stay in the hospital, he or she should have a bed allotted in a ward. Receptionists might also receive patient’s payments, record the min a database and provide receipts, file insurance claims and medical reports.

4. Draw a **use-case** diagram using StarUML for the retail **Point-of- sale system** - **POS** depicted below.

A retail POS system typically includes a computer, monitor, keyboard, barcode scanners, weight scale, receipt printer, credit card processing system, etc. and POS terminal software.

Checkout use case involves Customer, Clerk and Credit Payment Service actors and includes scanning items, calculating total and taxes, payment use cases. Checkout use case requires Customer actor, hence the 1 multiplicity of Customer. Clerk can only participate in a single Checkout usecase. Credit Payment Service can participate with many Checkout use cases at the same time. Checkout use case may not need Credit Payment Service (for example, if payment is in cash), thus the 0..1 multiplicity. Checkout use case is an example of a large and complex use case split into several use cases each describing some logical unit of behavior. Note, that including use case becomes incomplete by itself and requires the included use cases to be complete. Payment use case is represented using generalization relationship. It means that only one specific type of payment is accepted - either by cash, or by credit, debit, or with check. An alternative to such representation could be to use include relationship so that not just single but several forms of payment could be accepted from the same client during checkout.

**5. Credit card processing system**

**Credit Card Processing System** (aka Credit Card Payment Gateway) is a [**subject**](https://www.uml-diagrams.org/use-case-subject.html), i.e. system under design or consideration. Primary [**actor**](https://www.uml-diagrams.org/use-case-actor.html) for the system is a **Merchant’s Credit Card Processing System**. The merchant submits some credit card transaction request to the credit card payment gateway on behalf of a customer. Bank which issued customer's credit card is actor which could approve or reject the transaction. If transaction is approved, funds will be transferred to merchant's bank account.

6. **Website administration**

Top level use case diagram below shows some administrative functions that administration website could provide.

Two [**actors**](https://www.uml-diagrams.org/use-case-actor.html) using administrative interfaces are **Website Administrator** and **Help Desk**. Help Desk uses a subset of functions available to the Website Administrator. All top level [**use cases**](https://www.uml-diagrams.org/use-case.html) shown are abstract as each represents some group or "package" of administrative functionality.