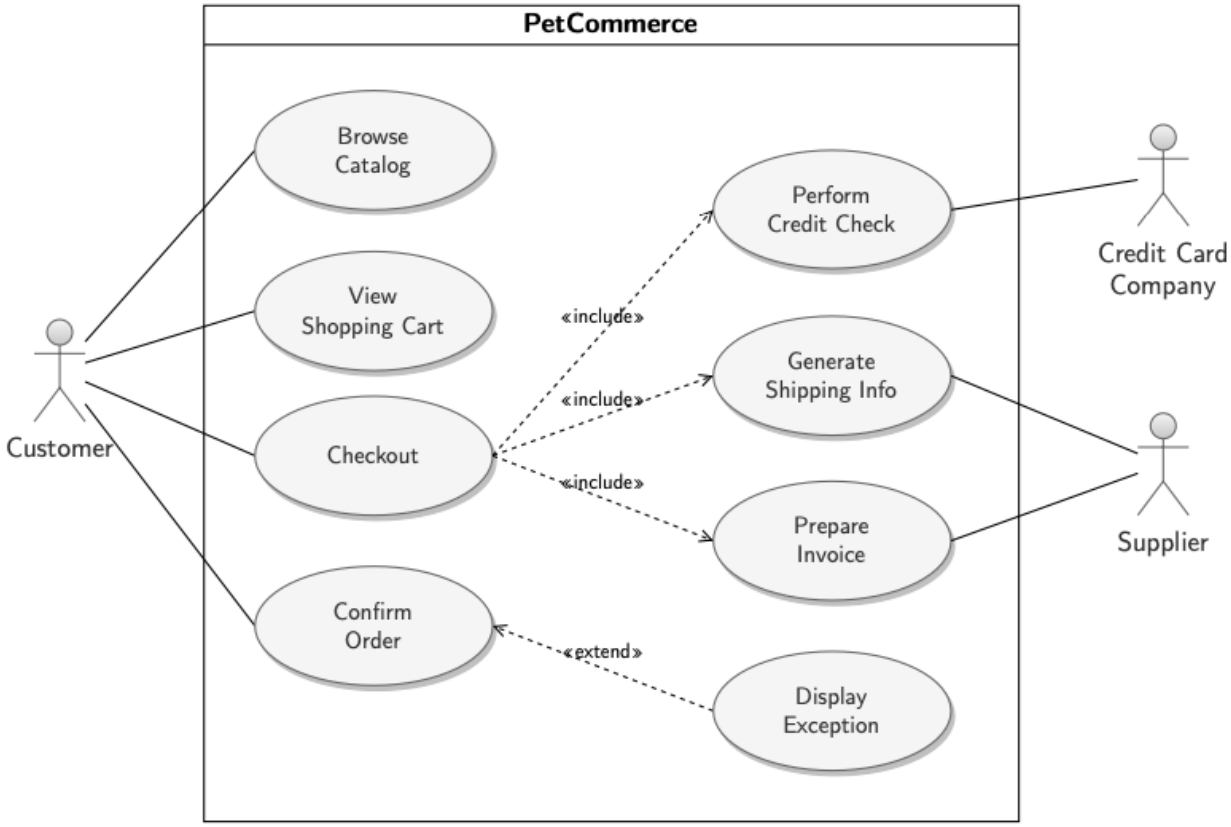
Lab 1: UML Package, Component, and Deployment Diagrams

Pet Commerce:

Imagine that you are part of a design team that is developing an online purchase order processing system called PetCommerce. PetCommerce specializes in providing an online marketplace for pet supplies. A brief description of PetCommerce and some of its requirements are provided below.

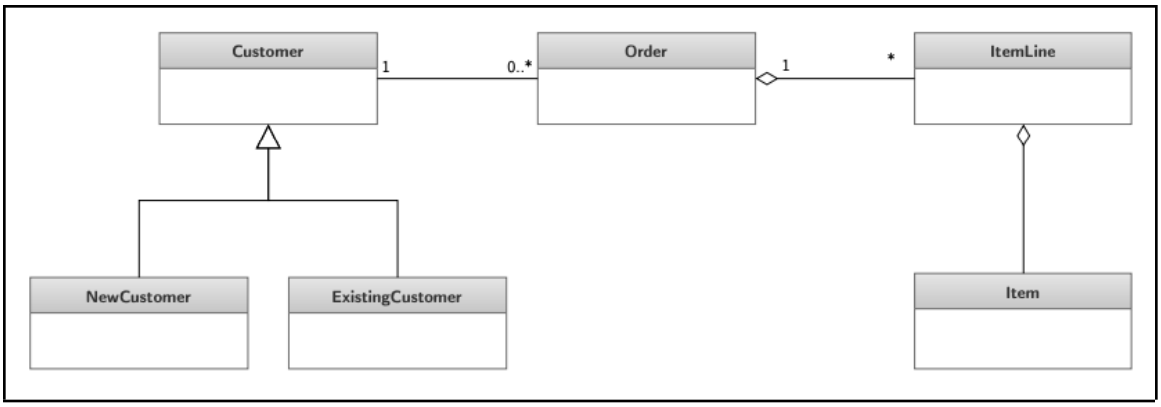
PetCommerce will consist of several applications that will enable customers to browse an online catalog of items for purchase, update their shopping cart, checkout, and confirm their orders. When checking out, a mandatory credit check must be completed by a credit card company to verify the payment details. Additionally, the shipping information must be generated and an invoice for the order must be prepared by the supplier. The customer can also confirm the order. When confirming an order there may or may not be an exception which should be displayed to the customer. This functionality is captured in the use case diagram provided below.



PetCommerce's purchase order system shall consider two types of customers: new and existing. Each customer can place zero or more orders. Each order consists of multiple item lines, each of which contains an item. Overall, PetCommerce shall have a graphical user interface (GUI) to enable customer access to the catalog and their shopping cart.

1. In software architecture and design, UML class diagrams often provide a simple means for effectively communicating basic elements of software design and relationships between different software structures (classes).

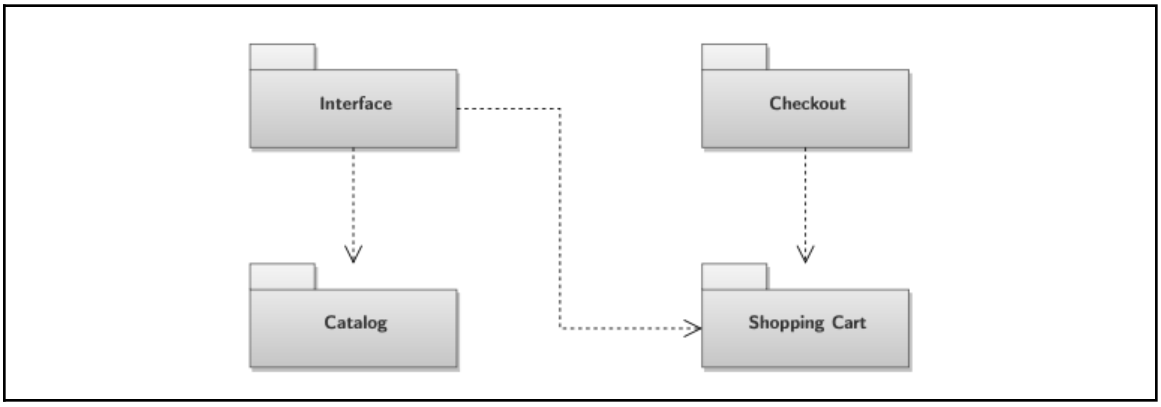
   Consider the provided PetCommerce description. Using a UML modeling or diagramming tool of your choice, create a UML class diagram for PetCommerce illustrating the relationships between the classes in the purchase order system.



2. The use of UML package diagrams to represent system structures can help reduce the dependency complexity and simplify relationships among groups of classes or modules.

   From the provided PetCommerce description, requirements, and use case diagram in Figure 5, it can be determined that all checkout-related classes depend on classes grouped related to the shopping cart. It can also be determined that the user interface package consisting of all GUI presentation classes are used to render the elements of the catalog and shopping cart.

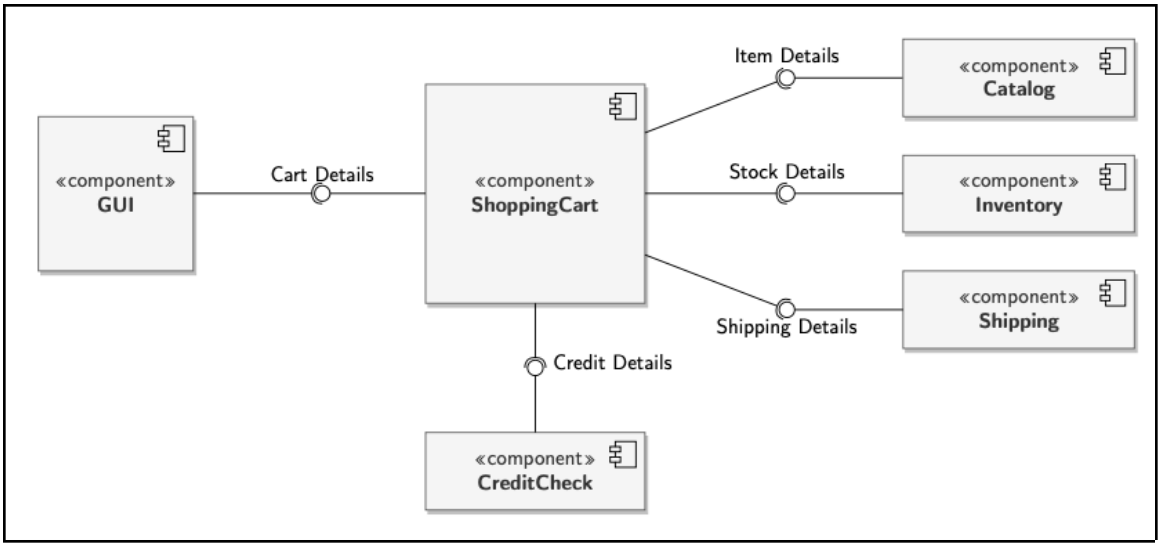
   Using a UML modeling or diagramming tool of your choice, create a UML package diagram that illustrates these dependency relationships for the PetCommerce.



3. A component is neither a class nor an object. A component is a deployable, reusable building block used in software design and development.

   Consider the shopping cart application for PetCommerce. A shopping cart component must provide services to front-end GUI interfaces such as ASP, JSP, or PHP web pages. The shopping cart component itself may need services from other components such as the catalog, inventory, shipping, and credit-check.

   Using a UML modeling or diagramming tool of your choice, create a UML component diagram that illustrates these components and their interfaces for the PetCommerce shopping cart application.



4. Deployment diagram depicts the physical configuration of the software system deployed on hardware server nodes and the network between the nodes (often defined as protocols). Normally, deployment diagrams are generated in the later phase of the software development life cycle. All components in the system must be deployed on servers to provide services via network protocols. Component diagrams are the basis for deployment diagrams.

   Consider the deployment of the shopping cart application for PetCommerce. The shopping cart should be deployed in a web server which communicates via TCP/IP to a separate application server which contains the business transaction component for the overall PetCommerce purchase order processing application. The application service will communicate via Java Database Connectivity (JDBC) to a database available in a data server. Other services are available from three components deployed by corresponding service providers. The inventory service is deployed via a supplier that is connected to a manufacturer and the credit service is deployed via a credit card company.

Using a UML modelling or diagramming tool of your choice, create a UML deployment diagram that illustrates this deployment.