1. Design an application that reads and writes different types of data (plain text, binary, etc.) to and from different destinations such as a file, a URL or a database. Apply the required pattern in designing the data read/write abstraction.
2. Design a code formatting application using the appropriate pattern. In general, programs can be written in any computer language (e.g., Java, VB, etc.) and a given program can be formatted in different ways such as simple text formatting, HTML formatting, color formatting and others. In effect, the interface for code formatting can be implemented in many different ways. Apply the required pattern to separate the interface from its implementations
3. Let us build a sales reporting application for the management of a store with multiple departments. The features of the application include:
   1. Users should be able to select a specific department they are interested in.
   2. Upon selecting a department, two types of reports are to be displayed:
      1. Monthly report — A list of all transactions for the current month for the selected department.
      2. YTD sales chart — A chart showing the year-to-date sales for the selected department by month.
4. Whenever a different department is selected, both reports should be refreshed with the data for the currently selected department Suppose you are creating a web application framework that will allow you to create different kinds of web applications. Perhaps you want to be able to use the framework to create blog, news sites, stores and other kinds of web applications. imagine that you wanted to be able to create different themes for you blog type of web application. You create a few different themes for your blog application. Perhaps you have a light theme and a dark theme.
5. The following is an example of the FQDN (fully qualified domain name) on the Internet: nwest.sales.DomainName.com It consists of different subdomains. Each such subdomain can be mapped onto a specific directory on the file system of the computer where the DomainName.com is hosted. Each such subdomain can have different HTML files, which can be accessed through a URL. Thus a subdomain and the set of HTML files can be viewed as two main components of a Web site.

a. Define a subdomain hierarchy for an example domain.

b. Create an application that uses the appropriate pattern to:

i. Display the directory a given subdomain is mapped onto

ii. Display the URLs of Web site components (either subdomains or single HTML files) in a uniform manner

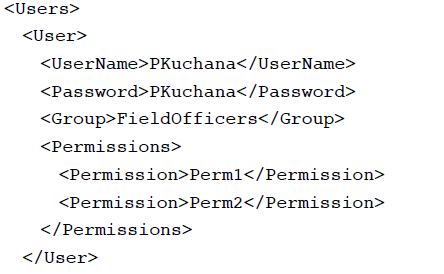
1. A typical product database consists of two types of product components — product categories and product items. A product category is generally composite in nature. It can contain product items and also other product categories as its subcategories. Example Product Categories: a. Computers b. Desktops c. Laptops d. Peripherals e. Printers f. Cables the Computers product category contains both the Desktops and the Laptops product categories as its subcategories. The Desktop category can contain a product item such as Compaq Presario 5050. Product items are usually individual, in the sense that they do not contain any product component within. Design and implement an application to list the dollar value of a product component. Use the appropriate pattern to allow the client application to refer to both the product categories and the product items in a uniform manner
2. public class OnlineCart  
   {  
       public void CheckOut(PaymentType paymentType)  
       {  
           switch(paymentType)  
           {  
               case PaymentType.CreditCard:  
                   ProcessCreditCardPayment();  
                   break;  
               case PaymentType.Paypal:  
                   ProcessPaypalPayment();  
                   break;  
               case PaymentType.GoogleCheckout:  
                   ProcessGooglePayment();  
                   break;  
               case PaymentType.AmazonPayments:  
                   ProcessAmazonPayment();  
                   break;  
           }  
       }  
     
       private void ProcessCreditCardPayment()  
       {  
           Print("Credit card payment chosen");  
       }  
     
       private void ProcessPaypalPayment()  
       {  
           Print("Paypal payment chosen");  
       }  
     
       private void ProcessGooglePayment()  
       {  
           Print("Google payment chosen");  
       }  
     
       private void ProcessAmazonPayment()  
       {  
           Print("Amazon payment chosen");  
       }  
   }
3. public class ConcreteCalculator : ICalculator  
   {  
       public int Add(int x, int y)  
       {  
           Print("Add(x={0}, y={1})", x, y);  
     
           var addition = x + y;  
     
           Print("result={0}", addition);  
     
           return addition;  
       }  
   }
4. public class SlowComponent : IComponent  
   {  
       public SlowComponent()  
       {  
           random = new Random((int)DateTime.Now.Ticks);  
           stopwatch = new Stopwatch();  
       }  
     
       public void Something()  
       {  
           stopwatch.Start();  
           for(var i = 0; i<100; ++i)  
           {  
               System.Threading.Thread.Sleep(random.Next(i) \*   
           }  
           stopwatch.Stop();  
           Print("The method took {0} seconds to complete",  
     stopwatch.ElapsedMilliseconds / 1000);  
       }  
     
       private readonly Random random;  
       private readonly Stopwatch;  
   }
5. A retail environment with an existing application. The application consists of three product category classes, Food, Accessories and Beverages. Each of these classes have the following properties:
   1. TotalPurchaseValue (a decimal property to hold the total of money spent purchasing all products in any of the categories converted from)
   2. TotalPurchaseConverted (a decimal property to hold the total converted to a different currency)
   3. PurchaseCurrency (The currency used to purchase items in a category)

The client needs to allow international offices to run an annual report. This report should take the TotalPurchaseValue (how much they spent on buying all products in a category) and use the PurchaseCurrency (the currency used to purchase products) then get the TotalPurchaseValue for each category using local currency

1. Let us consider an online job site that receives XML data files from different employers with current openings in their organizations. When the number of vacancies is small, employers can enter details online. When the number of vacancies is large, employers upload details in the form of an XML file. Once the XML file is received, it needs to be parsed and processed. Let us assume the XML file to have the following details:
   1. Job title
   2. Minimum qualifications
   3. Medical insurance
   4. Dental insurance
   5. Vision care
   6. Minimum number of hours of work
   7. Paid vacation
   8. Employer name
   9. Employer address In general,

Details from (c) through (i) are all considered being the same for all jobs posted by a given employer. Apply the required pattern to design the process of parsing the input XML file and creating different JOB objects

1. A computer user in a typical organization is associated with a user account. A user account can be part of one or more groups. Permissions on different resources (such as servers, printers, etc.) are defined at the group level. Users get all the permissions defined for all groups that their accounts are part of. Let us consider an organization with three different user groups — Administrators, FieldOfficers and SalesResps. Further assume that the organization is in the process of migrating user accounts from one server to a different server environment. As part of this process, all user accounts are first exported to an XML file as follows



It is to be noted that permissions for all accounts in a given group are the same. This can be considered as the intrinsic data. The user name and the password details vary from user to user and should be treated as extrinsic data. User accounts in the new server environment are created using the

Exported XML file. Make any necessary assumptions and design an application using the appropriate pattern to parse the XML file to create different user account objects.