**Problem 1: [15]**

Java provides quite a few exception classes. Use them whenever possible instead of creating your own exception classes. However, if you run into a problem that cannot be described by the predefined exception class, you can create your own exception class, derived from Exception or any of its sub class. In this task you have to create your own exception class and handle that as well.

**You are given the following code, copy it to your project and make following changes.**

1. Generate exception of typeIllegalArgumentException (this class already exists in java) in following functions of invoice class

* **setQuantity**

Generate exception when given quantity is less than zero.

* **setPricePerItem**

Generate exception when given quantity is less than zero.

1. Implement the method **getDiscountPercentage(MemberShip obj)** in invoice class. This method should check the membership type and then return discount on basis of membership type.
   1. 30 percent discount for Gold members
   2. 15 percent discount for Silver members
   3. 5 percent discount for Bronze members

It should throw exception of type **MembershipException** if the membership type is something other than Gold, Silver or bronze. (Create your own exception class named

**MembershipException**). DO NOT catch it here, catch it in main.

1. Make appropriate changes to handle checked/unchecked exceptions related compilation problem, if any.

|  |
| --- |
| import java.util.Date;  import java.io.\*;  import java.util.Date;  import java.io.\*;  interface Payable  {  double getPaymentAmount(MemberShip obj) throws MembershipException;  public int getDiscountPercentage(MemberShip obj) throws MembershipException;  }  class Invoice implements Payable {  private String itemNumber;  private int quantity;  private double pricePerItem;    public Invoice(String number, int count, double price) {  setItemNumber (number);  setQuantity(count);  setPricePerItem(price);  }  public void setItemNumber(String num) {  itemNumber = num;  }  public String getItemNumber() {  return itemNumber;  }  public void setQuantity(int count) {  quantity = count;  }  public int getQuantity() {  return quantity;  }  public void setPricePerItem(double price) {  pricePerItem = price;  }  public double getPricePerItem() {  return pricePerItem;  }  @Override  public String toString() {  return String.format("%s: \n%s: %s \n%s: %d \n%s: %f",  "invoice", "part number", getItemNumber(),  "quantity", getQuantity(), "price per item", getPricePerItem());  }  @Override  public double getPaymentAmount(MemberShip obj) throws MembershipException{  double amt = getQuantity() \* getPricePerItem() ;  amt = amt + (amt\*getDiscountPercentage(obj)/100);  return amt;  }    }  class MemberShip  {  int membershipType;  String membershipTitle;  Date membershipDate;  MemberShip(int type, Date startdate)  {  membershipType = type;  membershipDate =startdate;  }  void setMembershipTitle()  {  if(membershipType==1)  membershipTitle = "Gold";  else if(membershipType==2)  membershipTitle = "Silver";  else if(membershipType==3)  membershipTitle = "Bronze";  else  System.out.print("Invalid Type");  }  public int getMembershipType() {  return membershipType;  }  public Date getMembershipDate() {  return membershipDate;  }  }  public class test  {  public static void main(String ars[])  {  MemberShip memObj=new MemberShip(4, new Date());  Payable pObj= new Invoice("ITM123", 2, 10);  System.out.println(pObj.toString());  try  {  System.out.print(pObj.getPaymentAmount(memObj));  }  catch(MembershipException ex)  {}  memObj=new MemberShip(1, new Date());  pObj= new Invoice("ITM123", -5, 10);  System.out.print(pObj.getPaymentAmount(memObj));  }  } |

**Problem 2: [50]**

1. Open mysql (*either through commandprompt or sqlyog)*
2. Create a database named **LibraryDB**
3. Add following 2 tables to **LibraryDB**
   1. **Books** ( id int, bookTitle varchar(100), NoofPages int, Subject varcahr(100), authorId int)
   2. **Authors** ( id int, firstName varchar (100), lastName varchar (100))

Now create java application and write **Author** class with following methods:

1. **void DisplayAllAuthors()**

Select all authors from the Authors table, Order the information alphabetically by the author’s first name.

***Hint:*** *use order by clause in select ( as you studied in databases course)*

1. **void GetBooksbyAuthorID(int AuthorId)**

Takes author id as paramter and list all books for that author.

1. **int AddAuthor(int id, String firstName, String lastName)**

Add a new author in Authors table.

1. **int UpdateAuthorByID(int id, String firstName, String lastName)**

Edit the existing information for author whose id is received as parameter.

1. **int DeleteAuthorByID(int id)**

Delete the record of author whose id is received as parameter.

Create another class **Book** class with following methods:

1. **int AddBook(int id, String title, int no\_of\_pages, String Subject, int authorId)**

Add a new book in Books table.

1. **int UpdateBookByID(int id, String title, int no\_of\_pages, String Subject, int authorId)**

Edit the existing information for book whose id is received as parameter.

1. **int DeleteBookByID(int id)**

Delete the record of book whose id is received as parameter.

1. **void DisplayAllBooks()**

Select all books from the books table.

1. **void GetBooksBySubject(String subject)**

Select all books from the books table matching the subject given as parameter.

Create class test and write main method in test class. In main method create objects of Author and Book classes and call the methods you have written to test/demonstrate their working.