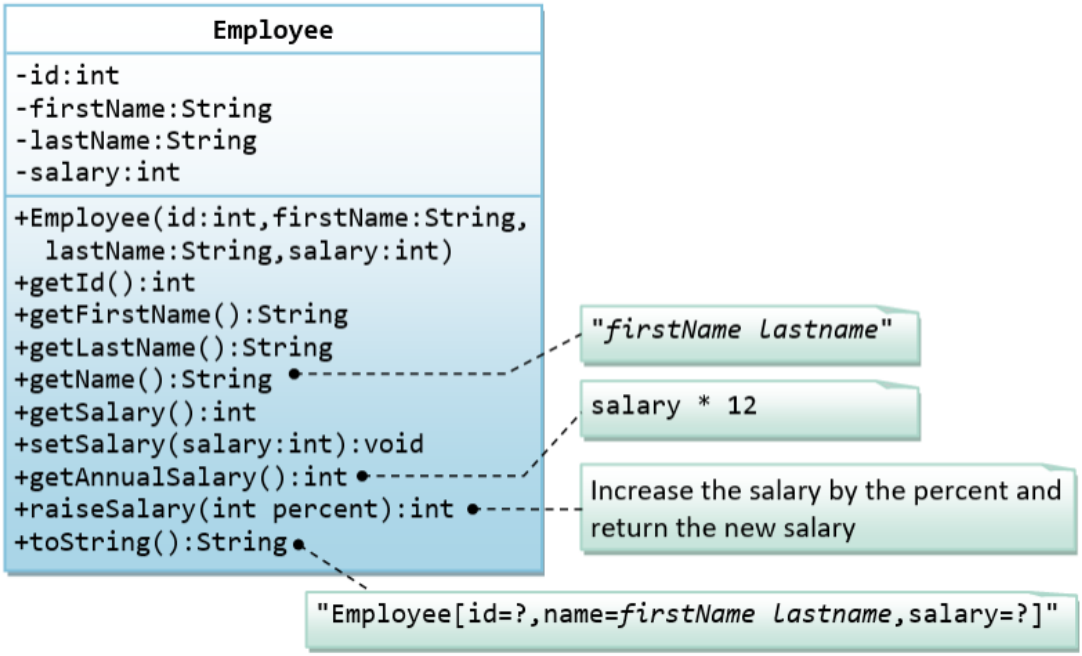
Assignment (BCAC391)

(Class composition, different type of constructors, and multiple package concept)

1. A class called **Employee**, which models an employee with an ID, name and salary, is designed as shown in the following class diagram. The method **raiseSalary(percent)** increases the salary by the given percentage. Write the **Employee** class.



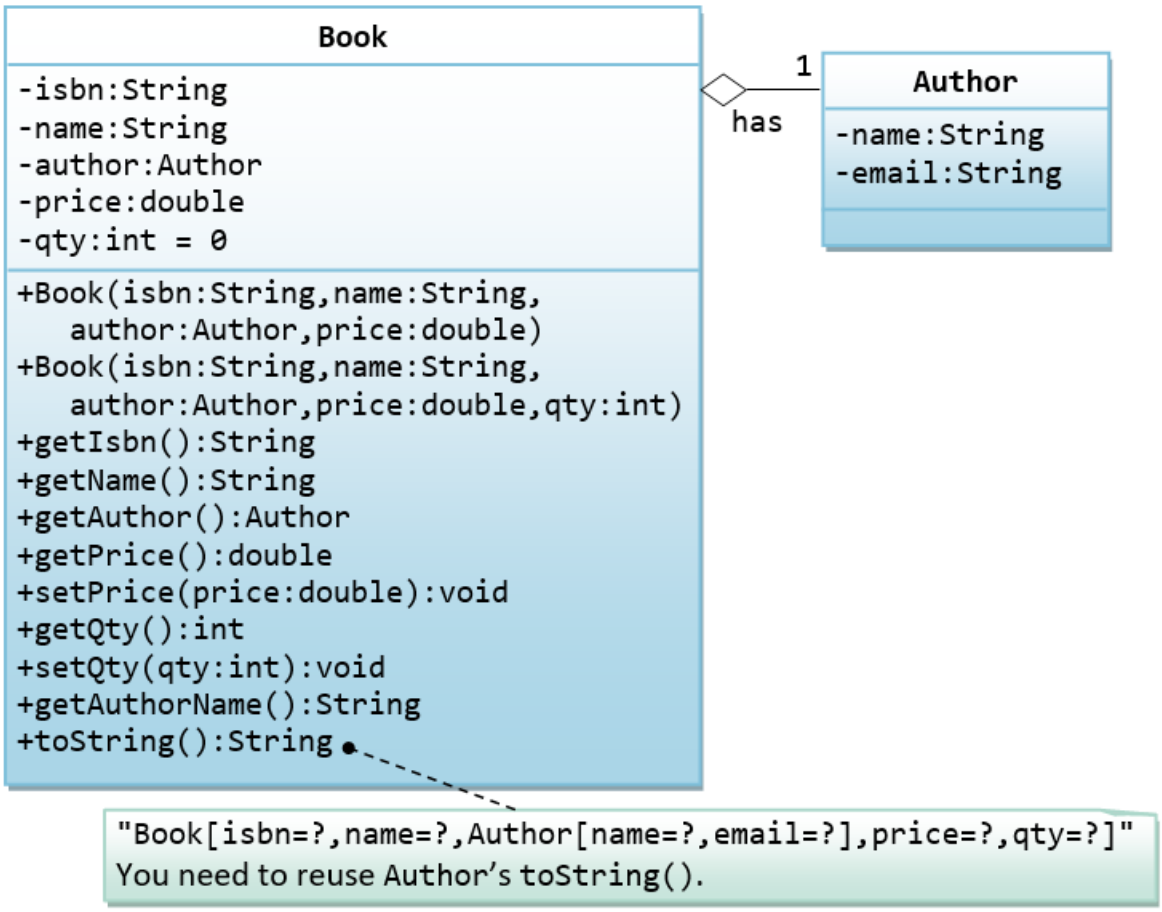
Below is a test driver to test the `Employee` class:

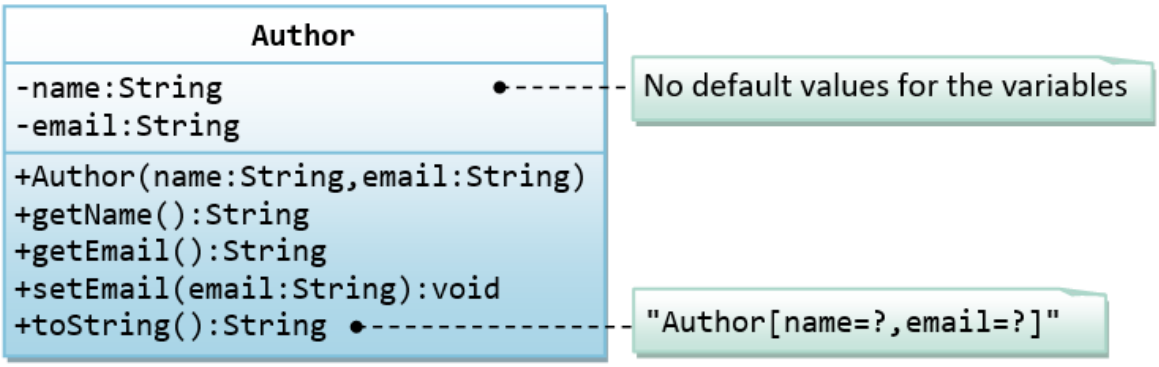
```
public class TestMain {

   public static void main(String[] args) {

      Employee e1 = new Employee(8, "Peter", "Tan", 2500);
      System.out.println(e1);   //toString();
      // Test Setters and Getters
      e1.setSalary(999);
      System.out.println(e1);  // toString();
      System.out.println("id is: " + e1.getId());
      System.out.println("firstname is: " + e1.getFirstName());
      System.out.println("lastname is: " + e1.getLastName());
      System.out.println("salary is: " + e1.getSalary());
      System.out.println("name is: " + e1.getName());
      System.out.println("annual salary is: " + e1.getAnnualSalary());
      System.out.println(e1.raiseSalary(10));
      System.out.println(e1);

   }
}
```

The expected out is:

```
Employee[id=8,name=Peter Tan,salary=2500]
Employee[id=8,name=Peter Tan,salary=999]
id is: 8
firstname is: Peter
lastname is: Tan
salary is: 999
name is: Peter Tan
annual salary is: 11988
1098
Employee[id=8,name=Peter Tan,salary=1098]
```

1. A class called Author, which models an author of a book, is designed as shown in the class diagram. A class called Book, which models a book written by ONE author and composes an instance of Author as its instance variable, is also shown. Write the Author and Book classes.





Below is a test driver:

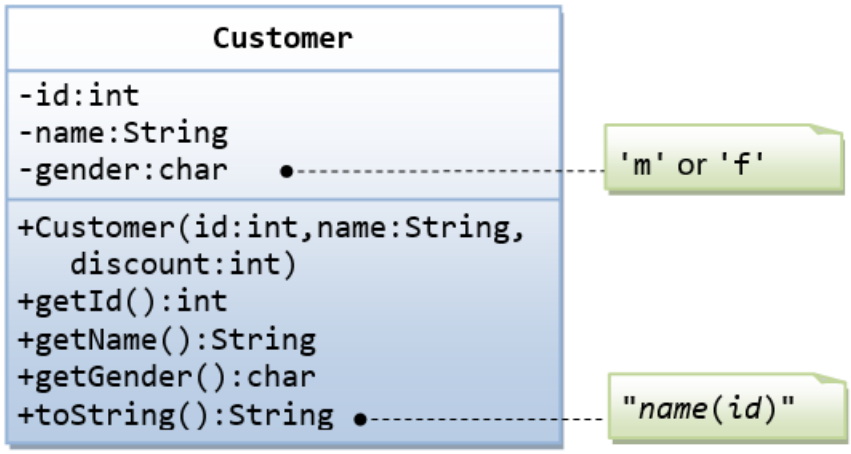
```
public class TestMain {
   public static void main(String[] args) {
      // Test Author class
      Author a1 = new Author("Tan Ah Teck", "ahteck@nowhere.com");
      System.out.println(a1);

      a1.setEmail("ahteck@somewhere.com");
      System.out.println(a1);
      System.out.println("name is: " + a1.getName());
      System.out.println("email is: " + a1.getEmail());

      // Test Book class
      Book b1 = new Book("12345", "Java for dummies", a1, 8.8, 88);
      System.out.println(b1);

      b1.setPrice(9.9);
      b1.setQty(99);
      System.out.println(b1);
      System.out.println("isbn is: " + b1.getIsbn());
      System.out.println("name is: " + b1.getName());
      System.out.println("price is: " + b1.getPrice());
      System.out.println("qty is: " + b1.getQty());
      System.out.println("author is: " + b1.getAuthor());  // Author's toString()
      System.out.println("author's name: " + b1.getAuthorName());
      System.out.println("author's name: " + b1.getAuthor().getName());
      System.out.println("author's email: " + b1.getAuthor().getEmail());
   }
}
```

The expected output is:

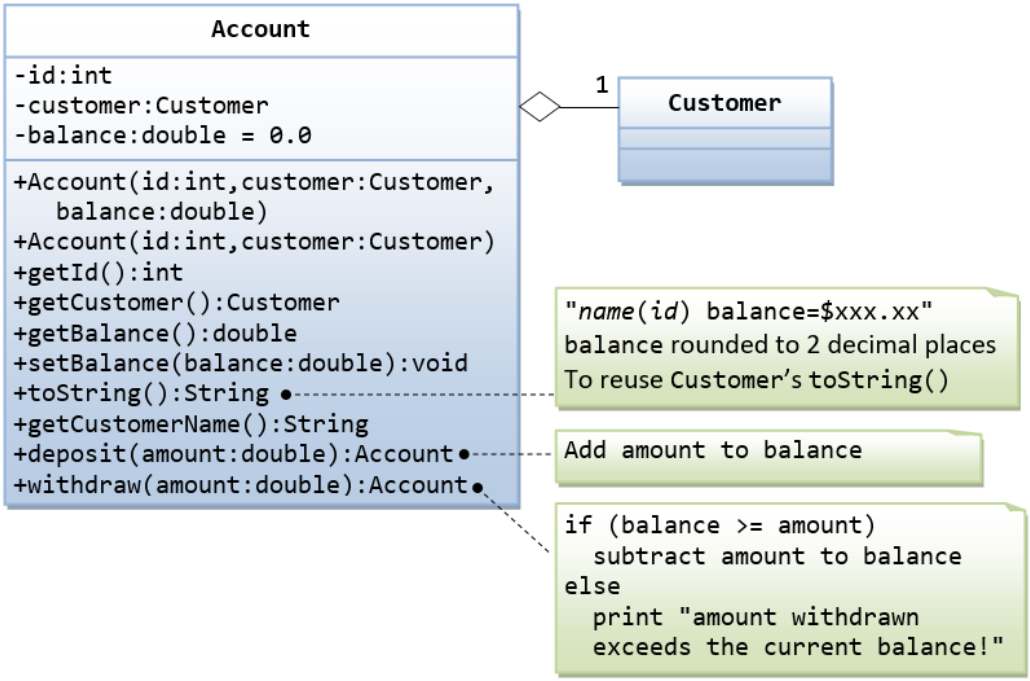
Author[name=Tan Ah Teck,email=ahteck@nowhere.com]
Author[name=Tan Ah Teck,email=ahteck@somewhere.com]
name is: Tan Ah Teck
email is: ahteck@somewhere.com
Book[isbn=12345,name=Java for dummies,Author[name=Tan Ah

Teck,email=ahteck@somewhere.com],price=8.8,qtt=88]
Book[isbn=12345,name=Java for dummies,Author[name=Tan Ah
Teck,email=ahteck@somewhere.com],price=9.9,qtt=99]
isbn is: 12345
name is: Java for dummies
price is: 9.9
qty is: 99
author is: Author[name=Tan Ah Teck,email=ahteck@somewhere.com]
author's name: Tan Ah Teck
author's name: Tan Ah Teck
author's email: ahteck@somewhere.com

2.



The `Customer` class models a customer is design as shown in the class diagram. Write the codes for the `Customer` class and a test driver to test all the `public` methods.



The `Account` class models a bank account, design as shown in the class diagram, composes a `Customer` instance (written earlier) as its member. Write the codes for the `Account` class and a

test driver.

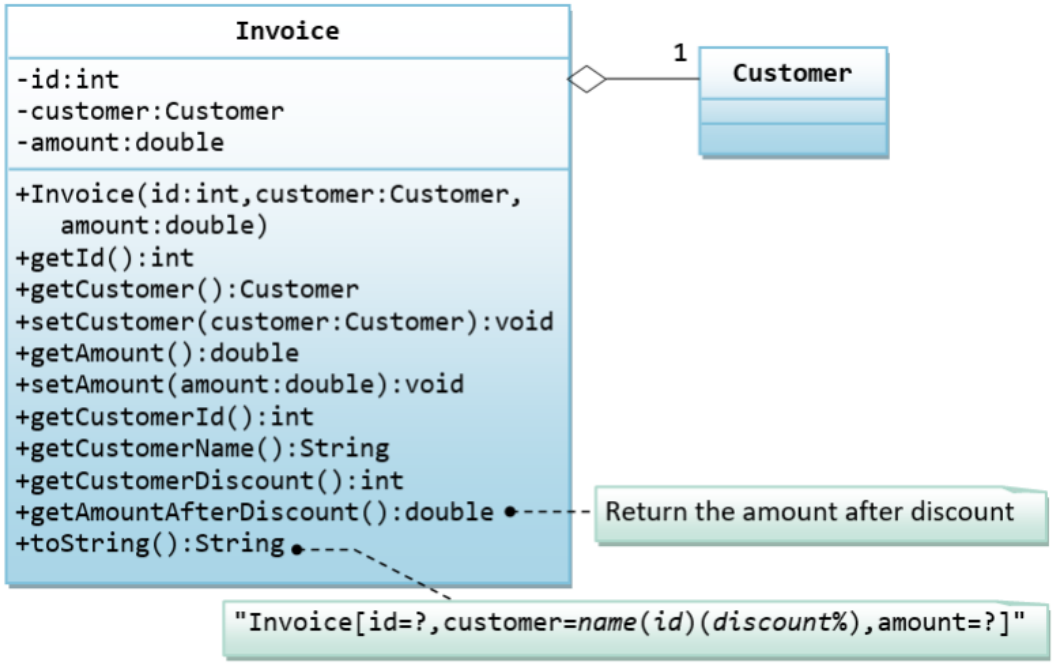
Below is test Driver:

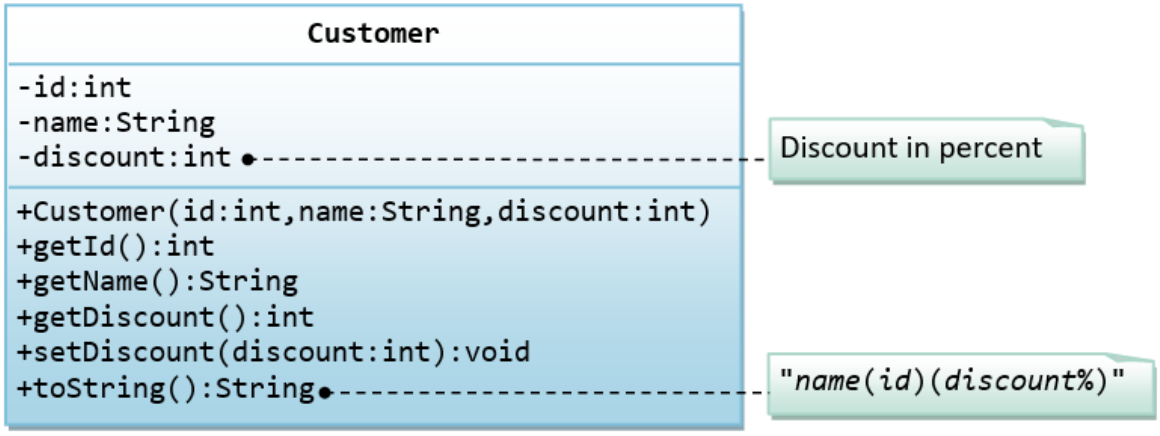
```
import com.account.pkg.Account;
import com.customer.pkg.Customer;

public class testDrive {
    public static void main(String[] args) {
        // TODO code application logic here
        Customer customer1=new Customer(1001,"Susovan Kumar Pan",'m');
        System.out.println(customer1);

       Account account=new Account(1001,customer1,500);
       account.deposite(100);
       account.withdraw(50);
       System.out.println(account);

       account.withdraw(600);
       //System.out.println(account);
    }
}
```

The expected output is:

```
Susovan Kumar Pan(1001)
Susovan Kumar Pan(1001) balance=$550.0
amount withdrawn exceeds the current balance!
```

3. A class called `Customer`, which models a customer in a transaction, is designed as shown in the class diagram. A class called `Invoice`, which models an invoice for a particular customer and composes an instance of `Customer` as its instance variable, is also shown. Write the `Customer` and `Invoice` classes.





Below is a test driver:

```
public class TestMain {
   public static void main(String[] args) {
      // Test Customer class
      Customer c1 = new Customer(88, "Tan Ah Teck", 10);
      System.out.println(c1);  // Customer's toString()

      c1.setDiscount(8);
      System.out.println(c1);
      System.out.println("id is: " + c1.getId());
      System.out.println("name is: " + c1.getName());
      System.out.println("discount is: " + c1.getDiscount());

      // Test Invoice class
```

```
      Invoice inv1 = new Invoice(101, c1, 888.8);
      System.out.println(inv1);

      inv1.setAmount(999.9);
      System.out.println(inv1);
      System.out.println("id is: " + inv1.getId());
      System.out.println("customer is: " + inv1.getCustomer());   // Customer's
toString()
      System.out.println("amount is: " + inv1.getAmount());
      System.out.println("customer's id is: " + inv1.getCustomerId());
      System.out.println("customer's name is: " + inv1.getCustomerName());
      System.out.println("customer's discount is: " + inv1.getCustomerDiscount());
      System.out.printf("amount      after      discount      is:      %.2f%n",
inv1.getAmountAfterDiscount());
   }
}
```

The expected output is:

```
Tan Ah Teck(88)(10%)
Tan Ah Teck(88)(8%)
id is: 88
name is: Tan Ah Teck
discount is: 8
Invoice[id=101,customer=Tan Ah Teck(88)(8%),amount=888.8]
Invoice[id=101,customer=Tan Ah Teck(88)(8%),amount=999.9]
id is: 101
customer is: Tan Ah Teck(88)(8%)
amount is: 999.9
customer's id is: 88
customer's name is: Tan Ah Teck
customer's discount is: 8
amount after discount is: 919.91
```