Systems Development: Object Oriented Analysis and Design

(H172 35)

Introducing Inheritance

Employees Walkthrough

Step 3 – fixing the issues and testing

We now have the BasePlusCommissionEmployee class derived from the CommissionEmployee class, but if we try to compile this new implementation then we get compiler errors…

Error - We cannot override the base class’s Earnings() method because it was not explicitly marked as “virtual”. The override modifier declares that a derived class method overrides a virtual or abstract base class method. (This modifier also implicitly declares the derived class method virtual and allows it to be overridden in the derived classes further down the inheritance hierarchy).

To fix – declare the Earnings() method as virtual in the base class CommissionEmployee

Error 2 - the Earnings() method and ToString() method in BasePlusCommissionEmployee refer to private instance variables in the base class CommissionEmployee.

To fix – one solution is to update the BasePlusCommissionEmployee to use the inherited *properties* from CommissionEmployee. Alternatively, we can update the visibility of the instance variables in the base class CommissionEmployee from *private* to *protected*, this is the solution we are going to implement.

As we did in Walkthrough Step 1, we are going to use the test class named BasePlusCommissionEmployeeTest. This has already been implemented, but the description of the functionality is provided below as a reminder:

* Create a BasePlusCommissionEmployee object and invoke it’s constructor to initialise it with a set of values (you choose)
* Use the **Properties** to display each attributes value individually to the console and the earnings:

First name is:

Last name is:

Social security number is:

Gross sales are:

Commission rate is:

Base Salary is:

Earnings are:

* Use the Properties to update the baseSalary to 1000.00
* Use the ToString method to display all of the objects details
* Use the Earnings() method to display the earnings

Employee information obtained by properties and methods:

First name is Bob

Last name is Lewis

Social security number is 333-33-3333

Gross sales are $5,000.00

Commission rate is 0.04

Earnings are $500.00

Base salary is $300.00

Updated employee information obtained by ToString:

base-salaried commission employee: Bob Lewis social security number: 333-33-3333

gross sales: $5,000.00 commission rate: 0.04 base salary: $1,000.00 earnings: $1,200.00

The output is identical to the previous test where the classes were implemented independently, however the source code for the inherited implementation is significantly shorter and there is now only one copy of the commission-employee functionality declared in class CommissionEmployee, which makes the code easier to maintain, modify and debug.