

## LAB Solutions

Thursday 7/3/2008

1. Create a `Project` class that includes the project ID and project name, and associated methods. Also the `Project` class should include an object reference variable that refers to an employee object and an associated method, `assignedEmployee(Employee e)`. This method sets a parameter (reference to an employee object) to the employee object reference variable. Update the `Employee` class, which was already defined in the previous lab, so the class includes an object reference variable that refers an project object and an associated method, `assignedProject(Project p)` that sets a parameter to the reference to the project object reference variable. Create the main class that creates an employee object and a project object, and print out the project object as well as employee object.

```
public class Project {
    private String ProjectID;
    private String ProjectName;

    private Employee employee;

    public Project (String pid, String pname){
        ProjectID = pid;
        ProjectName = pname;
    }

    public void setProjectID (String pid){
        ProjectID = pid;
    }

    public void setProjectName (String pname){
        ProjectName = pname;
    }

    public String getProjectID (){
        return ProjectID;
    }

    public String getProjectName (){
        return ProjectName;
    }

    public void assignedEmployee (Employee e){
        employee = e;
    }

    public String stringProjectInfo()
    {
        return "\nProject ID: " + getProjectID() + "\nProject Name"
+getProjectName()+ "\nAssigned Employee: " + employee.getFirstName() + " "
+employee.getLastName();
    }
}
```

```
public class Employee {
    private String firstName;
    private String lastName;
    private String socialSecurityNumber;
    private double monthlySalary;

    private Project myProject;

    public Employee (String first, String last, String ssn, double salary){
        firstName = first;
        lastName = last;
        socialSecurityNumber = ssn;
        monthlySalary = salary;
    }

    public void setFirstName(String first){
        firstName = first;
    }

    public void setLastNname(String last){
        lastName = last;
    }

    public void setSocialSecurtyNnumber(String ssn){
        socialSecurityNumber = ssn;
    }

    public String getFirstName(){
        return firstName;
    }

    public String getLastName(){
        return lastName;
    }

    public String getSocialSecurityNumber(){
        return socialSecurityNumber;
    }

    public double getMonthlySalary(){
        return monthlySalary;
    }

    public void assignedProject (Project p){
        myProject = p;
    }

    public String stringEmployeeInfo()
    {
        return getFirstName() + " " + getLastName() + "\nSSN: " +
getSocialSecurityNumber()+ "\nMonthly Salary: " + getMonthlySalary() +
"\nAssigned Project: " + myProject.getProjectName();
    }
}

public class EmployeeTest
{
    public static void main (String args[])
    {
        Employee newEmployee = new Employee("George", "Wang", "111-22-3333",
50000.00);
        Project newProject = new Project ("P10001", "CSUN-ITR");
    }
}
```

```

        newEmployee.assignedProject(newProject);
        newProject.assignedEmployee(newEmployee);

        System.out.println (newEmployee.stringEmployeeInfo());
        System.out.println (newProject.stringProjectInfo());
    }
}

```

- Now, change the methods `assignedEmployee(Employee e)` and `assignedProject(Project p)` so that these methods assign this (reference to themselves) to other object's object reference variable. Hint: Create a set method to assign the reference to an object reference variable and a get method to return the reference.

```

public class Employee {
    private String firstName;
    private String lastName;
    private String socialSecurityNumber;
    private double monthlySalary;

    private Project myProject;

    public Employee (String first, String last, String ssn, double salary){
        firstName = first;
        lastName = last;
        socialSecurityNumber = ssn;
        monthlySalary = salary;
    }

    public void setFirstName(String first){
        firstName = first;
    }

    public void setLastName(String last){
        lastName = last;
    }

    public void setSocialSecurityNumber(String ssn){
        socialSecurityNumber = ssn;
    }

    public String getFirstName(){
        return firstName;
    }

    public String getLastName(){
        return lastName;
    }

    public String getSocialSecurityNumber(){
        return socialSecurityNumber;
    }

    public double getMonthlySalary(){
        return monthlySalary;
    }

    public Project getProject(){
        return myProject;
    }
}

```

```

    }

    public void setProject(Project p){
        myProject = p;
    }

    public void assignedProject (Project p){
        myProject = p;
        p.setEmployee(this);
    }

    public String stringEmployeeInfo(){
        return getFirstName() + " " + getLastName() + "\nSSN: " +
        getSocialSecurityNumber() + "\nMonthly Salary: " + getMonthlySalary() +
        "\nAssigned Project: " + myProject.getProjectName();
    }
}

public class Project {
    private String ProjectID;
    private String ProjectName;

    private Employee employee;

    public Project (String pid, String pname){
        ProjectID = pid;
        ProjectName = pname;
    }

    public void setProjectID (String pid){
        ProjectID = pid;
    }

    public void setProjectName (String pname){
        ProjectName = pname;
    }

    public String getProjectID (){
        return ProjectID;
    }

    public String getProjectName (){
        return ProjectName;
    }

    public Employee getEmployee(){
        return employee;
    }

    public void setEmployee (Employee e){
        employee = e;
    }

    public void assignedEmployee (Employee e){
        employee = e;
        e.setProject(this);
    }

    public String stringProjectInfo(){
        return "\nProject ID: " + getProjectID() + "\nProject Name"
        +getProjectName()+ "\nAssigned Employee: " + employee.getFirstName() + " "
        +employee.getLastName();
    }
}

```

```

    }
}

public class EmployeeTest {
    public static void main (String args[]) {
        Employee newEmployee = new Employee("George", "Wang", "111-22-3333",
50000.00);
        Project newProject = new Project ("P10001", "CSUN-ITR");

        newEmployee.assignedProject(newProject);
        // newProject.assignedEmmployee(newEmployee);

        System.out.println (newEmployee.stringEmployeeInfo());
        System.out.println (newProject.stringProjectInfo());
    }
}

```

3. Create an Account class that includes the account ID and balance, and associated methods. Also, based on the Employee class defined in Exercise 2, modify the class by adding an account object as an attribute and modify the methods accordingly. Create the main class that creates an employee object and a project object, and print out the project object as well as the employee object, including the account object.

```

public class Employee {
    private String firstName;
    private String lastName;
    private String socialSecurityNumber;
    private double monthlySalary;

    private Account myAccount;
    private Project myProject;

    public Employee (String first, String last, String ssn, double salary,
String aid, double balance){
        firstName = first;
        lastName = last;
        socialSecurityNumber = ssn;
        monthlySalary = salary;

        myAccount = new Account(aid, balance);
    }

    public void setFirstName(String first){
        firstName = first;
    }

    public void setLastNname(String last){
        lastName = last;
    }

    public void setSocialSecurtyNnumber(String ssn){
        socialSecurityNumber = ssn;
    }

    public String getFirstName(){
        return firstName;
    }
}

```

```
public String getLastName(){
    return lastName;
}

public String getSocialSecurityNumber(){
    return socialSecurityNumber;
}

public double getMonthlySalary(){
    return monthlySalary;
}

public void assignedProject (Project p){
    myProject = p;
}

public String stringEmployeeInfo(){
    return getFirstName() + " " + getLastName() + "\nSSN: " +
getSocialSecurityNumber()+ "\nMonthly Salary: " + getMonthlySalary() +
"\nAssigned Project: " + myProject.getProjectName() + "\nBank Account: " +
myAccount.getAccountID() + "\nAccount Balance: " + myAccount.getBalance();
}

public class Account {
    private String accountID;
    private double balance;

    public Account (String id, double bal){
        accountID = id;
        balance = bal;
    }

    public void setAccountID (String id){
        accountID = id;
    }

    public void setBalance (double bal){
        balance = bal;
    }

    public String getAccountID (){
        return accountID;
    }

    public double getBalance (){
        return balance;
    }
}

public class EmployeeTest{
    public static void main (String args[]){
        Employee newEmployee = new Employee("George", "Wang", "111-22-3333",
50000.00, "A10001", 1000.00);
        Project newProject = new Project ("P10001", "CSUN-ITR");

        newProject.assignedEmployee (newEmployee);
        newEmployee.assignedProject (newProject);

        System.out.println (newEmployee.stringEmployeeInfo());
        System.out.println (newProject.stringProjectInfo());
    }
}
```

4. Exercise 1 on page 115: Construct a class `Car` that describes a car. A car should have a registration number and a text containing the make and model of the car. A car should also know its owner, a member of the class `CarOwner`, which will be a subclass of the class `Person` (see Exercise 2 on page 79). In addition, define the class `CarOwner`. For simplicity's sake, you should specify that a car owner may own only one car. Write methods that can be called when a car is bought or sold.